



Original Article

Effects of Physical Therapy on Pelvic Floor Dysfunction Among Women; A Randomized Controlled Trial

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ABSTRACT

Background: Pelvic floor dysfunction is the inability to relax and integrate the pelvic muscles appropriately. Constipation, bladder/bowel incontinence, and frequent bladder urges are the common symptoms. **Objective:** To determine the effects of physical therapy on pelvic floor dysfunction among women. **Methods:** It was a randomized controlled trial conducted between February to December 2021. About 72 patients were included using convenient sampling and they were equally divided into an experimental group receiving pelvic floor physical therapy and a control group receiving routine care. The woman aged between 18 to 60 years having pelvic floor dysfunction were included in the trial. Patients with pelvic organ prolapse more than stage II, urinary or vaginal tract infections and inability to understand or follow instructions were excluded. The assessment was made at baseline and after 4th week of intervention. Variables like age, body mass index and parity were presented as mean and standard deviation. The normality of the data was assessed using the Shapiro-Wilk test. The difference between pre and post-treatment readings was calculated using paired sample t-test for this parametric data. Statistical significance was set at $p \leq 0.05$. **Results:** The demographics including age, body mass index and parity were found to be 49.31 (12.43%), 25.71(4.56%) and 2.6(0.81%) in the pelvic floor physical therapy group and 51.23 (9.37%), 26.33(5.32%) and 2.2(93%) in the control group respectively, without any significant difference (p -value >0.05). After treatment at the 4th-week assessment, peak perineometer values (cmH₂O) were found to be 6.4(5.8) in the experimental group versus 10.3(6.7) in the control group, pelvic floor distress inventory short form 27.43(17.6) versus 42.8(31.8) and short form of pelvic floor impact questionnaire 9.86(4.39) versus 16.87(6.78), with a significant difference in favor of physical therapy group (p -value >0.05). **Conclusion:** The study concluded that pelvic floor physical therapy is significantly better as compared to the control group for relieving pelvic floor dysfunction including its control, coordination and distress.

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INTRODUCTION

Physical therapy relaxes and aligns the pelvic floor muscles, which is an effective treatment for a range of pelvic floor disorders (PFDs). Manual therapy, biofeedback, electrical stimulation, behavioral training, and home exercise are all part of this treatment. Prolapse, incontinence, peripartum and postpartum dysfunction, as well as persistent pelvic discomfort, are all treated with pelvic floor physical therapy (PFPT). The ligaments and tissue that support the pelvic organs are less stressed when the pelvic floor muscles are robust.

A pelvic floor failure may occur as a consequence of childbirth, aging, or stress-induced hypertonia. The PFDs are caused by connective tissue stress and may improve pelvic floor muscular strength, endurance, power and resting tone. The puborectalis, pubococcygeus, and iliococcygeus muscles are all involved. These muscles support and protect the pelvic floor. The urethral and anal sphincters, the bulbospongiosus, the ischiocavernosus, the superficial and deep transverse perineal muscles and the fascia layers.¹ The obturator internus and piriformis externally rotate the femur. Sacral, pudendal, and levator ani nerves innervate these muscles.² Nerves and 70% of the pelvic floor slow-twitch muscles maintain continence.³

Both internal and external PFPT parts must be checked. Lumbosacral and sacroiliac joints, iliopsoas and piriformis muscles, iliacus, and rectus abdominis muscle insertions, abdominal viscera, and the bladder are palpable externally.⁴ Abdominal and inguinal hernias, as well as diastasis recti abdominis were also examined. During exams, the level of discomfort, as well as the tone and flexibility of the pelvic floor are assessed. The examiner will look at the patient's muscle length, strength, endurance, as well as their ability to contract and release their muscles on their own. The obturator internus, the pudendal nerve in Alcock's canal, the urethra and the feared vulva are all

palpated during this procedure. Physical therapists create treatment programs by connecting objective data to patient symptoms.⁵ Biofeedback, electrostimulation, vaginal dilators, and weighted cones can strengthen pelvic floor muscles. When coughing, laughing, sneezing, or squatting, a person with stress incontinence may lose urine. PFPT strengthens the pelvic floor, lowering the risk of urinary tract infections (UTIs).⁶ In 2018, a Cochrane review included 31 PFPT trials with women having UTIs.⁷

Compared to placebo, sham or no treatment, PFPT groups were eight times more likely to report a cure. Eleven randomized controlled trials (RCTs) found that biofeedback does not reduce stress urinary incontinence (SUI) symptoms in women. In two RCTs, biofeedback and electrical stimulation had the highest cure rates. Studies had a weekly follow-up, high adherence and low attrition. SUI may require extensive PFPT training and monitoring. Overactive bladder syndrome (OBS) has nocturia, urgency, frequency, and incontinence while other symptoms include involuntary detrusor contractions. Studies showed that pelvic floor exercises may reduce bladder contractions.

The frontal cortex of the brain, which regulates urine production, can be stimulated by pelvic floor contractions to improve conscious bladder control. Puborectal, urethral, and anal sphincters relax the detrusor. The PFPT engages pelvic floor muscles to prevent urine leakage. One of the 31 RCTs in the 2018 Cochrane review evaluated a cure or improvement for urge urinary incontinence (UUI). Women treated with PFPT lose less urine than untreated women in 24 hours.⁸

In 2019, a systematic review compared PFPT to no treatment for UUI and found that PFPT improved UUI.⁸ These improved results suggested that PFPT is a viable treatment for UUI, but improvement levels were

inconsistent, and more evidence is needed. Uterus prolapse Exercise for prolapse If the pelvic floor and connective tissue attachments to the pelvic bones are weak, pelvic organs may herniate or drop abnormally. PFPT improves muscular power and coordination to lift the uterus, bladder and rectum while reducing symptoms and improving pelvic organ prolapse (POP) and quality of life. In the largest POP trial, PFPT reduced symptoms more than the control group, and more control group women sought more treatment. A 2019 meta-analysis found that PFPT for POP improved prolapse and POP stage.⁸

RCTs with better PFPT results required personalized instruction and monitoring. Exercise before and after prolapse and SUI surgery prevent 11 to 20% of failed operations. Many RCTs have looked at the PFPT before and after POP or SUI surgery.⁹ In three randomized trials, PFPT had no effect on the number of failed surgeries or how well people felt after surgery. PFPT helps MUI patients who have SUI surgery. Anal incontinence is 2% to 24% for gas, liquid, and feces. Fecal incontinence rises from 2.6% to 15% in older women.⁸ Half of those suffering from fecal incontinence also suffered from urinary incontinence. Biofeedback reduces PFPT-related fecal incontinence, according to nonrandomized research.

Neither PFPT nor advice performed better than biofeedback. A Cochrane review published in 2016 found no evidence that some biofeedback or exercise is more beneficial.¹⁰ Biofeedback or electrical stimulation is more effective than PFPT alone for nonresponders. Anal and fecal incontinence are treated with biofeedback or electrical stimulation. Postpartum women with pelvic floor dysfunction were 46 percent pregnant or had recently given birth. Postpartum women have 34% urinary and 4% fecal incontinence. Cochrane reviewed 38 RCTs to determine if PFPT prevents or treats urinary and fecal incontinence in

pregnant and postpartum women. Six randomized controlled trials found prenatal PFPT reduced urinary incontinence in late pregnancy and 3-6 months postpartum. Six months postpartum, incontinence risk did not decrease. A 2018 meta-analysis examined PFPT's effects on psychosis, sexual function, and fecal incontinence. Seven RCTs show PFPT reduces urinary incontinence after childbirth. In three studies, fecal incontinence symptoms remained. Neither PFPT nor conventional treatment improved life quality for obstetric anal sphincter injuries.

The PFPT can treat urinary incontinence, POP, and postpartum sexual dysfunction. Postpartum OASIS patients need more research on PFPT's effectiveness. High-tone pelvic floor muscles cause pain, dyspareunia, vaginismus, and vulvodynia in 16% of women. Pelvic myofascial pain (PFMP) is caused by myofascial trigger points. Symptoms include dyspepsia and pain. PFPT helps with myofascial pain and spasms. In 2005, Tu et al. evaluated manual therapy's ability to ease pelvic pain. Despite technique and sample size, 59–80% of women reported PFPT pain relief. 21 women's pelvic floors were examined for myofascial dysfunction by Oyama et al. 4.5 months of pain relief followed 5 weeks of intravaginal myofascial release.

Dyspareunia/vaginismus During sexual activity or vaginal penetration, dyspareunia causes pain. Vaginismus causes perineal spasms that hinder penetration.¹¹ Bedaiwy et al. conducted a study on PFPT patients who had chronic pelvic pain and dyspareunia. Patient education, dilatation exercises, and home exercises are all effective treatments for vaginitis. Women with vestibulodynia had a larger pain response to poking and a higher level of tonic surface electromyography activity in the superficial pelvic floor muscles, according to V. Gentilcore-Saulnier and colleagues. Despite patients' reservations about the procedure, pelvic floor physical therapy is a low-risk and successful treatment.^{8,12} The purpose of the

study was to find the effects of physical therapy on pelvic floor dysfunction among women.

METHODS

It was a randomized controlled trial conducted at Link Medical Centre, Lahore between February to December 2021. A total of 72 patients were included using convenient sampling, which was equally divided into 36 in each group i.e., the experimental group receiving pelvic floor physical therapy and the control group receiving routine care without physical therapy intervention.¹³ The woman aged between 18 years to 60 years with pelvic floor dysfunction were included in the trial.¹⁴ Those with pelvic floor dysfunction were excluded if having previous experience with

pelvic floor physical therapy, pelvic organ prolapse more than stage II, urinary or vaginal tract infections and inability to understand or follow instructions.¹⁴⁻¹⁶

The baseline assessment was made by an independent assessor through thorough examination and strength assessment as well as biofeedback. In the next step patients were educated regarding exercise and treatment procedures. Suggest hands-on review of pelvic floor anatomy and Physiology Thiele's massage, home exercise program, transverse abdominal contractions, and transverse abdominal clamshell exercises.^{17,18}

The patients were given exercise through biofeedback which included a sequence of breathing exercises transverse, abdominal contractions, and transverse abdominal clamshell exercises.¹⁸⁻²⁰

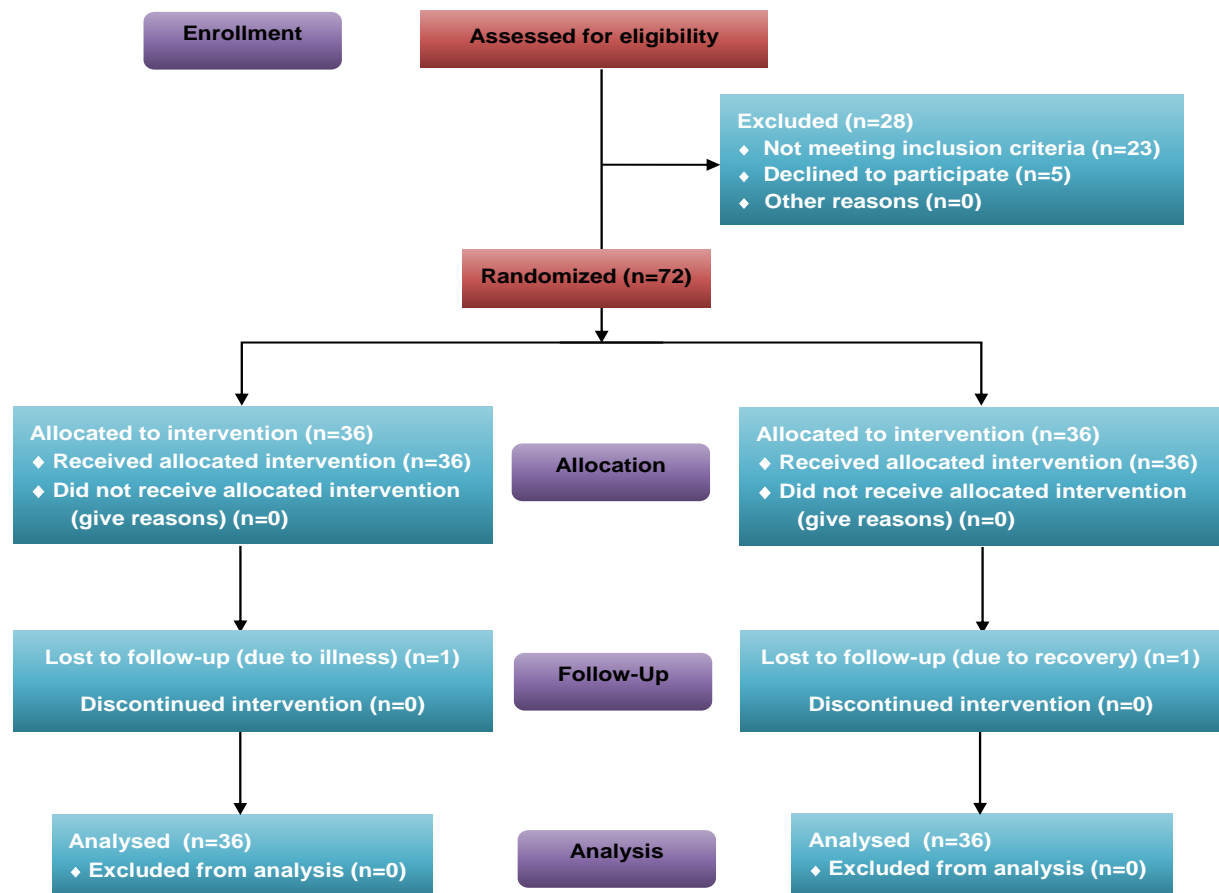


Figure I: CONSORT Layout

Table I: Paired Sample t-test For Different Variables In Both Groups

	Variable	PFPT Group n=36	Control Group n=36	p-value
Week 0	Age (years)	49.31 (12.43)	51.23 (9.37)	0.879
	Body mass index	25.71(4.56)	26.33(5.32)	0.128
	Parity	2.6(0.81)	2.2(93)	0.087
	Peak perineometer values (cmH ₂ O)	13.47(10.23)	14.78(9.56)	0.479
	Pelvic floor distress inventory short form	57.6(36.7)	55.8(39.4)	0.117
	Pelvic floor impact questionnaire short form	26.7(21.8)	27.3(18.9)	0.881
Week 4	Peak perineometer value (cmH ₂ O)	6.4(5.8)	10.3(6.7)	0.043
	Pelvic floor distress inventory short form	27.43(17.6)	42.8(31.8)	0.018
	Pelvic floor impact questionnaire short form	9.86(4.39)	16.87(6.78)	0.022

The control group was regularly attended without active intervention for group discussion related to the disease. The data were collected before treatment and 6 weeks after the start of treatment. The data was comprised of demographics such as age, body mass index (BMI) and parity. The outcomes included pelvic floor muscle strength, a short form of pelvic floor distress inventory and a pelvic floor impact questionnaire.

Data were analyzed using SPSS version 23. Variables like age, body mass index and parity were presented as mean and standard deviation. The normality of the data was assessed using the Shapiro-Wilk test. The difference between pre and post-treatment readings was calculated using paired sample t-test for this parametric data. Statistical significance was set at $p \leq 0.05$.

RESULTS

The demographics including age, body mass index and parity were found to be 49.31 (12.43), 25.71(4.56) and 2.6(0.81) in the PFPT group and 51.23 (9.37), 26.33(5.32) and 2.2(93) in the control group, respectively, without any significant difference (p -value $0 > 0.05$). The assessment before treatment regarding Peak perineometer values (cmH₂O) was found to be 13.47(10.23) in the PFPT group versus 14.78(9.56) in the control group, Pelvic floor distress inventory short form 57.6(36.7) versus 55.8(39.4) and pelvic floor impact questionnaire short form 26.7(21.8) versus 27.3(18.9), without any significant difference (p -value > 0.05). After treatment at the 4th-week assessment, peak perineometer values (cmH₂O) were found to be 6.4(5.8) in the PFPT group versus 10.3(6.7) in the

control group, pelvic floor distress inventory short form 27.43(17.6) versus 42.8(31.8) and pelvic floor impact questionnaire short form 9.86(4.39) versus 16.87(6.78), with a significant difference in favor of PFPT group (p -value>0.05).

DISCUSSION

Pelvic floor physical therapy is the first-line treatment for stress, urge and mixed urine and fecal incontinence. PFPT has the potential to prevent and treat stress incontinence and prolapse incontinence. PFPT has the potential to prevent and treat stress incontinence and prolapse. The pelvic floor is strengthened by training the pelvic floor muscles before and during increases in abdominal pressure.⁸ Due to the lack of long-term data, some have advocated for a critical evaluation of PFPT.

According to research, inclusion and exclusion criteria were not based on whether patients had pelvic floor complaints. Our results can only be utilized by women who can find their pelvic floor muscles. Women who do not stretch properly will derive less benefit from PFPT. The PFDI-20 and PFIQ-7 scores of both groups increased by 44–55% without pelvic floor dysfunction.²¹ Brubaker et al. discovered that pelvic exercise programs alleviate the symptoms of pelvic floor dysfunction. It was anticipated that increased pelvic floor strength would improve participants' symptoms, but this was not evaluated. Brubaker et al. discovered that gym-based pelvic muscle exercises can alleviate pelvic floor symptoms in women.^{22,23}

Participants in the PFPT and control groups expressed gratitude and enthusiasm; there were no dropouts in either group. Several aspects of the workouts may have had an impact on attrition rates. PFPT may be less enjoyable but the physical therapists in our study used invasive vaginal manipulation, which required disrobing.²⁴ PFPT enhances strength, mobility, and posture by targeting

the levator ani muscles. Perineometry was practiced by PFPT participants during each workout, whereas control group participants did so pre and post-treatment. The strength of our PFPT program may not have been maximized. Since PFPT teaching guidelines are constantly evolving, some providers may view our PMFT program as outdated. We excluded women with previous Pilates or PFPT training. We achieved our target sample size of 36 per group, but the research was limited (and hence our power). Before recommending PFPT for PFD, randomized studies are necessary.²⁵

It was difficult to simulate the treatment protocol in the control group; however, it was achieved through patient-therapist discussion sessions. The final data analysis must include all patients randomly assigned to study therapies.²⁶ This strategy is only applicable when all participants have measurements. Because we only collected a single set of outcomes after 12 weeks of exercise, our research design did not permit such an analysis. Before the collection of post-treatment data, women dropped out.²⁷ The randomization method used in current study was effective, as there were no statistically significant differences between our original research groups and trial participants. Adapting PFPT to a group class or web-based platform may be beneficial if future studies with symptomatic patients are successful.

This study may lead to the widespread application of pelvic floor exercises for the treatment and prevention of pelvic floor disorders.²⁸ These can also be performed after vaginal births and pelvic reconstruction surgeries.

CONCLUSION

The study concluded that pelvic floor physical therapy is significantly better as compared to no treatment or the control group for relieving pelvic floor dysfunction symptoms including its control, coordination, and distress.

DECLARATIONS

Consent to participate: Written consent had been taken from patients. All methods were performed following the relevant guidelines and regulations.

Availability of data and materials: Data will be available on request. The corresponding author will submit all dataset files.

Competing interests: None

Funding: No funding source is involved.

Authors' contributions: All authors read and approved the final manuscript.

CONSORT Guidelines: All methods were performed following the relevant guidelines and regulations.

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