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## RESEARCH ARTICLE

# EFFECT OF PILATES TRAINING AND CONVENTIONAL TRAINING IN WOMEN WITH STRESS URINARY INCONTINENCE: A COMPARATIVE STUDY

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**ABSTRACT**

Urinary Incontinence is an unpleasant and most common crisis for adult, mainly for majority of the women in today's fast life; stress incontinence is the most common problem. Weak pelvic floor muscles are primarily responsible for urinary incontinence. It is a distressing and disabling condition mainly affecting the social and psychological well being of an individual. Different forms of pelvic floor muscle exercises are used to lessen the severity of stress urinary incontinence by improving the strength of the pelvic floor muscles. Thus, this study was done to check the effectiveness of the Pilates Training and Conventional Therapy Exercises in women with urinary incontinence and their impact on the quality of life of the women.



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## INTRODUCTION

International Continence Society defines Urinary Incontinence as "a condition in which involuntary loss of urine which is objectively demonstrable with such a degree of severity that is is a social and hygienic problem, and affecting the quality of life severely (Agarwal, 2017)." It not only causes embarrassment, loss of self confidence but also may lead to urinary tract infections, pressure ulcers and diseases of the perineal skin. The emotional feelings such as loneliness, sadness and depression are mostly present in the incontinent woman life (Knorst *et al*., 2011). Globally UI affects the quality of life for at least one third of the woman (Kumari *et al*., 2008). UI is a universal health problem amongst woman, with the prevalence varying from 8-45% in different studies (Agarwal, 2017). In a survey done in Asia, the prevalence of urinary incontinence in India was 12% (Bhatt *et al*., 2013). There are various types of Urinary Incontinence: Stress, Urge, Giggle, Mixed, Overactive Bladder, Nocturnal Enuresis and more. The most common type of incontinence is Stress Urinary Incontinence (SUI) with an estimated prevalence of 8–33% (Agarwal *et al*., 2017; Knorst, 2011; Kumari *et al*., 2008). SUI is defined as the involuntary loss of urine during physical exertion, e.g. coughing, sneezing, laughing, running (Agarwal *et al*., 2017) (Agarwal, 2017). SUI is most common type of incontinence among woman accounting for as much as 65% of all types of UI in woman. It is highest in young and middle aged group (Agarwal, 2017; Abrams, 2010). Proper examination and history is very much important in UI to decide the treatment protocol. The pregnancy, child birth and increase in age play a major role in developing SUI.[6] There are many management focusing on treatment for Stress Urinary Incontinence (SUI) of which the Conservative therapy includes improving the way of living by bladder re-training, pelvic floor muscle exercises, biofeedback, vaginal cones and electrical stimulation of pelvic floor muscles (Agarwal, 2017; Abrams, 2010). Pelvic floor muscle exercises were first described as a possible treatment for urinary incontinence by Kegel's in 1948. Pelvic floor muscle exercise intend to strengthen the perivaginal and perianal musculature in order to increase a woman's control of urine leakage (Joanna Briggs Institute, 2011). In 1948, Kegel's reported that pelvic floor training produces a cure rate of 84% for woman with various types of urinary incontinence. Rehabilitation of the pelvic floor muscle in form of Kegel's exercises is done which helps in stabilizing

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the urethra by increasing pelvic floor muscle strength. This exercise does not require any instrument, can be done anywhere and is cost effective (Bø, 2004; Tithi Gadhavi, 2017). Behavioral interventions are generally comparatively inexpensive and easy to implement and its effectiveness depends chiefly on the patient's motivation and compliance.[10] Therefore, this type of treatment does require a high level of motivation and encouragement. The advantages of behavioral methods are that it progress central control of the bladder function, prevention of the mortality and morbidity of surgery, and no adverse drug reactions (Dolan *et al*., 2001). Joseph H. Pilates developed the comprehensive program known as the Pilates method in the 1920's.The Pilates method incorporates both physical and mental elements. The technique focuses on the "power house" or what is known today as the core; in Pilates, this includes the abdominal, gluteal and paraspinal muscles in particular (Dolan, 2001; Schroeder, 2002). The goals are to increase muscle strength and endurance as well as flexibility and to improve posture and balance (Segal *et al*., 2004).

The mental element of Pilates is evident in the additional focus on breathing and concentration during the execution of these exercises. Exercises can be performed both on mat as well as on specialized equipment. In the mat class, participants typically sit or lie supine or prone and use gravity to help stabilize the core. Pilates focuses on strengthening the core muscle, which builds strength, increases spinal and pelvis stability and improves balance and coordination. Pilates also focuses on the abdominal area and helps those muscles physiologically in a number of ways (Schroeder, 2002; Segal *et al*., 2004). Pilates is a form of exercise based on movement principles including whole-body movement, centering, concentration, precision, breathing and rhythm (Lange *et al*., 2000). It focus on core body exercise and breath control, and facilitates activation of transversus abdominis, diaphragm, multifidus and pelvic floor muscles. It has been assumed that Pilate's exercise can produce significant improvements in the pelvic floor muscle strength (PFMS), since most of the exercises are performed in conjunction with contraction of the muscle group. These exercises are essential because urinary continence, maintenance of the intra-abdominal pressure, and respiratory mechanics are interdependent (Gomes *et al*., 2018).

## MATERIAL AND METHODS

This Comparative study was conducted in Rahata Public Training Centre, Pravara Medical Sciences, Loni and received ethical clearance from the Institute (ref no. PIMS/CPT/ IEC/2018/196). It was conducted for duration of one year. Total of 32 participants had participated in the study. The Participants included in the study were **p**articipants above the age group of 20 years, Post partum after 6 weeks, participants suffering from Stress Urinary Incontinence. And the excluded if there was any previous experience with either Pelvic Floor Muscle Training or Pilates, Inability to follow detailed verbal instruction, Participants with history of Neurogenic Bladder, Participants with history of Tumors of the Bladder, Participants with history with Genital Prolapse and any medical condition making it impossible to perform Pilates maneuvers. Of the 32 participants included in the study 3 were excluded due to their previous experience with Pilates and Kegels and 2 participants refused to participate. Total 27 participants agreed to participate and written informed consent was taken then baseline data and pre intervention assessment was done. After that the participants were randomized in Group A (Pilates) 14 participants and Group B (Conventional Therapy) consisted of 13 participants of which 2 participants from Group A and 1 participant from Conventional Therapy discontinued the study. The effectiveness of Intervention was assessed using the outcome measure Modified Oxford Scale (MOS) for pelvic floor strength and the quality of life was assessed using King's Health Questionnaire (KHQ). The participants in Group A received Pilates training for 45 minutes, 4 days a week for 4 weeks. Group B received Conventional Therapy; In conventional therapy the participants received Kegel's exercise and Behavioural Therapy for 30 minutes, 4 days a week for 4 weeks. After 4 weeks again the strength and quality of life was assessed, then the effect of Pilates training and conventional training were compared.

**Data Analysis and Result**

Statistical analysis was carried out utilizing demo version of INSTAT software and p value 0.05 is considered as level of significance unpaired 't' test was applied to analyse the data

## DISCUSSION

The present study showed that the intervention given to both the groups was effective in terms of increase in quality of life (QoL) and Pelvic floor strength irrespective of the treatment received which was Pilates Training or Conventional Therapy. However, the group which received Pilates Training showed more significant improvement as compared to the Conventional group in overall outcomes. Kegel exercises are the most popular method of reinforcing pelvic floor muscles strength and are non-invasive treatment such that they do not involve the placement of any vaginal weights/cones. They were first described in 1948 by the American gynecologist Anold Kegel. They are the most cost-effective treatment and differ from other therapies in that the patients can do them by themselves anytime, anywhere, while doing other work, and without regular hospital visits. The patients simply need to be trained in how to contract their pelvic floor muscles. Majority of studies show that Kegel exercises steadily strengthen the pelvic muscles. However, in practice the results of patients vary depending on whether they exercise their pelvic floormuscles (Park, 2014). Behavioral treatments improve bladder control by varying the incontinent patient's behavior, particularly his or her voiding habits, and by teaching skills for preventing urine loss. These treatments are successful for most outpatient men and women with stress, urge, or mixed incontinence. The aim of behavioural treatments is to improve bladder control by changing the incontinent patient's behaviour, especially his or her voiding habits, and by teaching skills for preventing urine loss (Burgio, 2004). Various studies revealed that Behavioral treatment along with Kegel's exercise is a safe and effective conservative intervention in urinary incontinence (Burgio *et al*., 2000). Pilates improves mental and physical wellbeing, increases flexibility and strengthens muscles through controlled movements of whole, rather than having a specific muscle focus. It avoids intense abdominal contractions; breath holding or straining that could put increased pressure on the pelvic floor while at the same time incorporating exercises that can incidentally train the pelvic floor (Lausen *et al*., 2018; Paithankar *et al*., 2016). According to Pilates principles like centering, precision, concentration, breathing it basically acted on each and every body part of the participants like physical as well as psychological.

**Table 1. Comparison of mean of King's Health Questionnaire (KHQ) scores between Group A and Group B**

| | Mean ±SD | | 't' value | 'p' value | Result |
|---|---|---|---|---|---|
| TUG | Pre | Post | | | |
| Group A | 54 ± 3.76 | 38.08 ± 3.94 | 11.365 | <0.0001 | Extremely Significant |
| Group B | 56 ± 3.015 | 43.58 ± 2.74 | 12.564 | <0.0001 | Extremely Significant |
| Group A v/s Group B | Group A Post | Group B Post | 3.966 | 0.0007 | Extremely Significant |
| | 38.08 ± 3.94 | 43.58 ± 2.74 | | | |

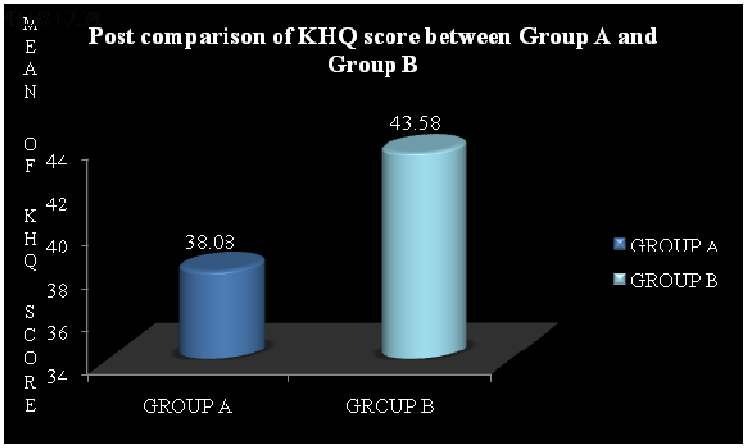


**Fig 1. Comparison of mean in post intervention between Pilates Training and Conventional Therapy using KHQ where t value is 3.966 and p value 0.0007 which is statistically extremely significant.**

**Table 2. Comparison of mean of Pelvic floor strength between Group A and Group B**

| | Mean ±SD | | 't' value | 'p' value | Result |
|---|---|---|---|---|---|
| BBS | Pre | Post | | | |
| Group A | 2.41 ± 0.51 | 3.66 ± 0.49 | 9.574 | <0.0001 | Extremely Significant |
| Group B | 2.25 ± 0.75 | 2.91 ± 0.66 | 4.690 | 0.0007 | Extremely Significant |
| Group A v/s Group B | Group A Post | Group B Post | 3.129 | 0.0049 | Statistically Significant |
| | 3.66 ± 0.49 | 2.91 ± 0.66 | | | |

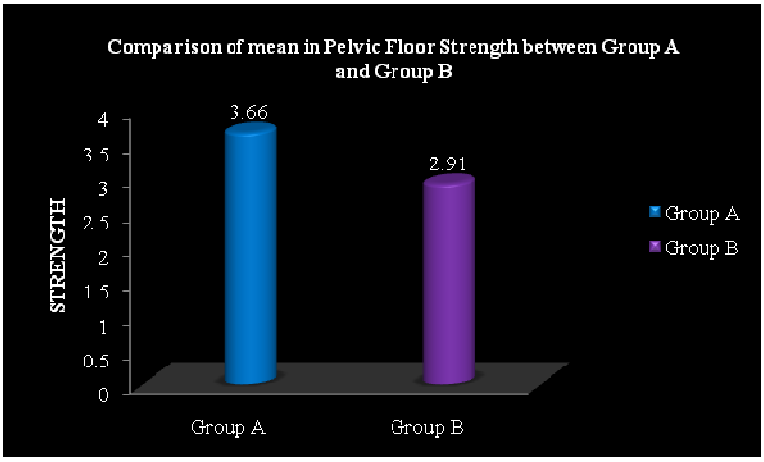


**Fig. 2. Comparison of mean in post intervention of Pelvic Floor Strength between Pilates and Conventional Therapy using Modified Oxford Scale (MOS) where t value is 3.129 and p value 0.0049 which is statistically significant**

It had shown highly significant changes in concentration, negative affect and behavioural change. As one of the principles is concentration naturally the participants were concentrating on exercise session fully. So Pilates helped them to get deviated from their pain, depression and suffering and engaged them in learning some new technique of exercise.[20,21] It has been assumed that Pilates method can produce significant improvements in the pelvic floor muscle strength (PFMS), since most of the exercises are performed in conjunction with contraction of the pelvic floor muscle group. Such exercises are significant because urinary continence, maintenance of the intra-abdominal pressure, and respiratory mechanics are interdependent (Gomes *et al*., 2018). Study by Adi Lausen on Modified Pilates in his study stated that there was a range of benefits for women who attended MP classes in addition to SPC (Standard Physiotherapy Care) which helped them in improving self-esteem, decreased social embarrassment, less impact on normal daily activities and improved personal relationships especially for women with lower symptom severity (Lausen *et al*., 2018).

A study by Shachi M Paithankar et.al on effectiveness of Pilates over Primary Dysmenorrhea on pain and quality of life concluded that Pilates along with Conventional Physiotherapeutic Treatment can be effective treatment for relieving pain and improving quality of life in females with primary dysmenorrhea (Paithankar, 2016). A comparative study by Pournima Pawar on Mat based Pilates exercises and conventional exercises on core muscle strength in postnatal women supported our study by stating that the 3 weeks of Pilates Training was more effective than the conventional exercises to improve the core muscle strength. Pilates helps in learning how to properly engage all of the core muscles to stabilize and protect the lumbopelvic area with everyday activities and exercise (Pawar *et al*., ?). Pilates exercises are of low-cost, have low risk and are non-invasive and it is based on very controlled and slow movements. Pilates exercises works on core through body, mind and breathing control which lacks in stabilization exercises. As both the studies have been studied separately but there is hardly any study which has compared both the techniques. Favorable, efficient, easy, comprehensive, comfortable, convenient exercises need to be promoted for the betterment of post-partum women. Thus, information obtained from this study would be beneficial to women with postpartum Stress Urinary Incontinence (SUI). Present study showed extremely significant improvement in Quality of Life and increase in the Pelvic floor strength after getting treatment for 4 weeks of treatment in Pilates Group. Improvement was also seen in the Conventional group but the effect was seen more in other group.

**Conclusion**

The present study concludes that the Pilates treatment can be effective treatment to improve the quality of life and increase the strength of pelvic floor muscle in women with post-partum stress urinary incontinence. Therefore I reject the null hypothesis and accept an alternate hypothesis.

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