

A COMPARATIVE STUDY ON EFFECTIVENESS OF PILATES VERSUS RESISTED HIP ROTATION ON SEVERITY OF STRESS URINARY INCONTINENCE AMONG POSTMENOPAUSAL WOMEN**MahisreeBharathi.U.V (Ph.D)*¹, Nishanthini G.², Dr. Sandhiya M. Ph.D³ and Dr. P. Senthil Selvam Ph.D⁴**^{1,3}Assistant Professor, School of Physiotherapy, VISTAS, Chennai, India.²MPT, School of Physiotherapy, VISTAS, Chennai, India.⁴HOD and Professor, School of Physiotherapy, VISTAS, Chennai, India.***Corresponding Author: MahisreeBharathi.U.V**

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ABSTRACT

Stress urinary incontinence (SUI) is a prevalent condition among postmenopausal women, characterized by the involuntary leakage of urine during activities that increase intra-abdominal pressure affects the quality of life, leading to psychological distress, social embarrassment, and reduced participation in physical activities. Hence this study aims to find the comparative study on effectiveness of Pilates versus resisted hip rotation on severity of stress urinary incontinence among postmenopausal women. 40 subjects are randomly divided into 2 groups of 20 subjects in each group. Group A was given Pilates and Group B was given resisted hip rotation exercises for 6 weeks. Pre test and Post test values was recorded using QUID (Questionnaire for female Urinary incontinence Diagnosis) and 1 hour pad test which helps to identify the severity of urinary incontinence. On comparing the mean values of the tools used [1 hour pad test and QUID] the scores between the pre and the post- test within the group shows significant difference at $p \leq 0.001$. This study concludes that Pilates is more effective than resisted hip rotation exercises.

KEYWORDS: Stress urinary incontinence, Post-menopause, QUID, 1 hour pad test, Pilates, Resisted Hip Rotation.

INTRODUCTION

Menopause is well-demarcated as the everlasting end of fertility and menstruation in a woman. A woman is deliberated to be postmenopausal when she had no periods for a year, that in 12 consecutive months in a row. Most women become menopausal naturally between the ages of 49 to 52 years, but around 51 years is the mean age of the onset of menopausal. But when it occurs between 40 and 45 years of age it is labelled as 'early menopausal'. After menopausal, the risk of certain medical disorder increases, such as osteoporosis, urinary incontinence (UI), weight gain and osteoarthritis.^{[5][6]} Menopausal has also been reported to show an impact on mental health and commonly observed psychological symptoms such as anxiety, depression, irritability.^{[7][8]} Considering postmenopausal females, the most frequently observed health issue is UI. It has been reported to affect 50% of postmenopausal women.^[11]

Hormonal changes associated with estrogen deficiency may also contribute to the occurrence of osteoporosis. Other symptoms of menopause include hot flushes, sweating (especially at night), irritability, problems with

concentration, joint pain, vaginal dryness, as well as urogenital disorders. Among them, incontinence is extremely common. Urinary incontinence (UI) is an important social problem that affects more than 50% of postmenopausal women. The number of patients increases from year to year, affected by the rapid social development contributing to a sedentary lifestyle. It affects mainly the sedentary nature of work, too frequent use of the car or the lack of time for any physical activity. This trend is particularly evident in the elderly, who often spend their free time watching TV, and they do not practice sport. These factors weaken the overall performance of the body, leading to weakness of the muscles or bones, respiratory disorders and circulatory problems. The result is the emergence of neuropathology and dysfunctions of the body that cause a significant reduction in quality of life.

One common problem that affects postmenopausal women is incontinence. Awareness of women regarding this disease increases from year to year. Nevertheless, many patients still consider incontinence as a natural symptom of aging. It is estimated that in Poland this

disease affects over 5 million people. According to recent data, UI affects women twice as often as men. This condition occurs in about 20-30% of young women, 30-40% in middle age and up to 50% of women in old age. This problem significantly affects the quality of life of affected women. Urinary incontinence negatively affects many aspects of life, significantly reducing the daily functioning associated with work, physical activity or the intimate sphere. Urinary incontinence is the main symptom of genitourinary syndrome of menopause (GSM) and is often associated with sexual dysfunctions.

The International Continence Society (ICS) defines urinary incontinence as involuntary uncontrolled leakage of urine due to bladder dysfunction of the locking mechanism. This definition, in force since 2002, and the previous one are different in that this phenomenon does not need to be supported by documentation and testing. The latest ICS report indicates the need for expansion of the definition and information relating to additional symptoms, incidence, risk factors and impact on health and quality of life.

There are five types of urinary incontinence. Nevertheless, some authors of scientific reports assign patients to three main categories, only distinguishing stress incontinence, urge incontinence and mixed urinary incontinence. Among the most common urinary incontinence divisions the following stand out. Stress urinary incontinence (SUI) – according to some authors, it is the most common type of UI and represents 50% to 88% of all types of urinary incontinence. It is characterized by leakage of urine, which is caused by an increase in abdominal pressure. Situations that predispose to this condition are primarily sneezing, bending, and lifting weights. SUI arises from weakening of the pelvic floor muscles and failure of complex Musculo-ligamentous-fascio cutaneous tissues. Among the most common causes of the disease are childbirth, trauma, hormonal disorders and a reduction in reproductive organs, and operations.

The etiology of the problem of incontinence is not fully understood, because the problem can affect men and women of all ages and can be due to many changes in the human body. Factors which predispose to the occurrence UI may have different bases. Among the most important, genetic factor stands out, because as noted, this factor is higher in women whose ancestors suffered from incontinence.

Age is also very important. The risk increases in direct proportion to age. In postmenopausal women the incidence of disease is doubled. This is primarily due to the fact that urinary tract infection reduces the level of estrogen in the blood. As a result, this situation causes the reduction of the urethra. Sometimes the urethra is shortened to 1-2 cm. Moreover, very often it is followed by muscle weakness and also the reconstruction of the bladder and the muscles responsible for the excretion of urine. A very important factor is the number of

pregnancies and births, particularly those induced with oxytocin.

It is suggested that caesarean deliveries are safer in terms of occurrence of UI. The probability of disease increases also when the weight of the fetus exceeds 4 kg. Another important factor is obesity. The most dangerous is abdominal obesity. Studies show that obese women are 4-5 times more likely to suffer from incontinence than those of normal weight. Among other factors which may affect the occurrence of UI that are also ignored or improperly treated are urinary tract infections, chronic constipation, diabetic neuropathy, Parkinson's disease, multiple sclerosis, polyradiculopathy, drugs or medications for example diuretics, antihypertensive and anxiolytic. Another risk is chronic respiratory diseases, particularly those extending from a cough, which causes an increase in abdominal pressure, for example chronic obstructive pulmonary disease.

MATERIALS AND METHODOLOGY

This is a comparative study done among Post menopause women to find the effects of Pilates and Resisted hip rotation exercise on reducing severity of stress urinary incontinence. A total of 40 subjects were selected based on inclusion criteria and were divided into 2 groups with each group containing 20 members.

INCLUSION CRITERIA

- Postmenopausal women >12 months since their last menstrual periods
- Diagnosis of stress urinary incontinence
- Mild to moderate SUI severity
- Ability to perform physical exercises
- Lightly active lifestyle
- Willing participants

EXCLUSION CRITERIA

- Mixed urinary incontinence
- History of pelvic surgery
- Neurological disorders
- Uncontrolled diabetes mellitus
- Current hormone therapy
- Cognitive impairments
- Urinary tract infection
- Non willing participants

Among 40 samples, 20 will be assigned for Pilates group and 20 will be assigned for Resisted Hip Rotation exercise randomly.

GROUP A - The subjects were asked to perform 12 different Pilates postures for 1st and 2nd week for 20 minutes, 3rd and 4th week for 30 minutes, and 40 minutes in 5th and 6th week. Start by holding for 10 seconds then gradually increase to 1 minute hold. Before and after exercise, warming up and cooling down movements were performed. The pilates group performed (1) Pilates Breathing (2) Bent Knee Fallout (3) Swan Dive (4)

Shoulder Bridge (5) Single Leg Kick (6) Stretching Double Legs (7) Heel Slides (8) Rolling Up (9) Stretch Single Leg (10) Front and Back kicks (11) Side lying side kicks (12) Single Leg Circle.

GROUP B – The subject was asked to follow Resisted Hip Rotation for 1st, 2nd, 3rd week for 10 minutes and 4th, 5th, 6th week for 20 minutes for 5 days a week twice a day, once early in the day and once late in the day. The RHR group performed (1) hip external and internal rotation with diaphragmatic breathing for 10 breaths, (2) 10 repetitions of hip external rotation with a green resistance band holding 5 seconds and resting 5 seconds, and (3) 10 repetitions of hip internal rotation/adduction, squeezing a 9” soft inflatable ball for 5 seconds, with 5-second rest.

With hip external rotation, subjects were instructed to roll their knees out against the band, not more than shoulder width apart with feet flat and forming a V position, heels

touching and toes pointed outward.

When performing hip internal rotation, subjects were instructed to squeeze the ball by rolling their knees inward and touching their toes together while sliding their heels apart. The same foot positions were used with the initial hip external and internal rotation while breathing diaphragmatically.

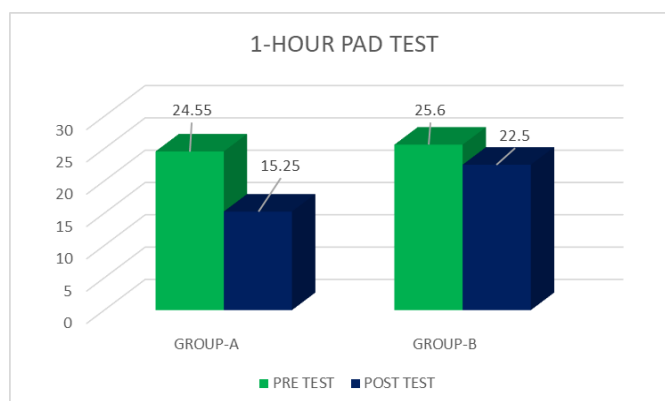
DATA ANALYSIS

The collected data were tabulated and analyzed using both descriptive and inferential statistics. All the parameters were assessed using statistical package for social science (SPSS) version 26.0. Paired t-test was adopted to find the statistical difference within the groups & Independent t-test was adopted to find the statistical difference between the groups.

Table 1: Comparison Of 1-Hour Pad Test Score Between Group – A and Group – B In Pre-Test And Post-Test.

1-HOUR PAD TEST	GROUP A		GROUP B		t-TEST	SIGNIFICANCE
	MEAN	SD	MEAN	SD		
PRE-TEST	24.55	10.58	25.60	13.17	0.271	.788*
POST TEST	15.25	9.28	22.5	13.54	1.879	.000**

(* - $P > 0.05$, ** - $P \leq 0.001$)



Graph -1: Comparison of 1-Hour Pad Test Score Between Group – A and Group – B In Pre-Test And Post-Test.

RESULT

In table 1, comparing mean values of GROUP- A and GROUP- B on 1- hour pad test score shows highly significant improvement in the post-test mean but GROUP- A shows (15.25) lesser mean value is more effective than GROUP- B (22.50) at $P \leq 0.001$. Hence the null hypothesis is rejected.

DISCUSSION

The purpose of this study is to compare the effects of Pilates exercise and resisted hip rotation exercise on reducing stress urinary incontinence among postmenopausal women. The major goal is to improve overall physical health and well-being through a combination of Pilates and resisted hip rotation, by enhancing their strength, flexibility, mental health and overall quality of life. The present study was concluded to estimate the

prevalence of stress urinary incontinence and to compare the prevalence and severity of stress urinary incontinence among postmenopausal women. Based on the finding, the prevalence of stress urinary incontinence was estimated to be higher among postmenopausal women with the mean of 24.55 on 1 hr pad test in group A and mean of 25.60 on 1 Hr pad test group B.

Recent studies indicate that stress urinary incontinence (SUI) remains a significant concern among postmenopausal women. A 2023 study involving 273 women, including both perimenopausal and postmenopausal participants, found that 41.8% of perimenopausal women and 48.7% of postmenopausal women experienced SUI. This suggests that nearly half of postmenopausal women may be affected by SUI. Additionally, a 2024 study observed that urodynamic

stress incontinence increased steadily after menopause, becoming the predominant type after the age of 60. This underscores the heightened risk of SUI in postmenopausal women. This shows that prevalence of stress urinary incontinence among post-menopausal women is higher. Based on 1 hour pad test on the group and within the group, the t test which is statistically significantly at $p=0.001$. The study concluded that severities of postmenopausal increased by family history, lifestyle habits, factors like stress, cognitive changes, weight gain, urinary incontinence, joint pain, sleep disturbances, anxiety.

Exercise is extremely important throughout woman's lifetime and particularly as she gets older. There is connection between pelvic floor muscles and exercise. A daily moderate exercise has shown great benefits for to strengthen pelvic floor. A study has shown that pelvic floor exercises led to improvements in stress urinary incontinence by improving pelvic floor strength, stability, and function, which can be particularly beneficial for postmenopausal women who may experience pelvic floor dysfunction or urinary incontinence. The Pilates is an excellent form of exercise for postmenopausal women, offering benefits that address common concerns such as it improves bone density, enhance core strength, boost balance and coordination, increase flexibility and mobility, support mental well-being, weight management, improve pelvic floor muscle exercises.

It is specifically useful in managing stress urinary incontinence (SUI). Whereas post menopause is found to be common at the age of 40-50 years by Hagar E. Lialy et al., 2023 and in this study the samples were selected between the ages of 40-50 years. Kiran Mushtaq, Iram Mushtaq, Ayesha Bajwa, Asna Waseem, Sana Batool, Arif Ali Rana [2023] – concluded that there is a higher prevalence of urinary incontinence among post-menopausal females. A greater number of child births, vaginal delivery, diabetes and high blood pressure are among some of the associated factors with urinary incontinence.

CONCLUSION

The present study concludes that both group A Pilates exercises and Group B Resisted Hip Rotation had shown improvement in Stress urinary incontinence among Post menopausal women, but more significant improvement was observed in patients who underwent Pilates than resisted hip rotation exercises.

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