MS.ID-IJPBS-2201
International Journal of Pharmacy and Biological Sciences-IJPBS™ (2025) 15 (3): 32-36
Online ISSN: 2230-7605, Print ISSN: 2321-3272
Research Article | Biological Sciences | OA Journal | MCI Approved | Index Copernicus

Effectiveness of Pilates and Paula Method for Stress Urinary Incontinence Among Obese Postmenopausal Women-An Experimental Study

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Received: 10 Mar 2025 / Accepted: 9 Apr 2025 / Published online: 1 Jul 2025
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Abstract

Background of the Study: Stress Urinary incontinence is an involuntary urinary leakage on effort, exertion, sneezing or coughing due to failure of sphincter .UI is an important social problem that affects more than 50% of postmenopausal women. **Objective of the Study:** To determine the effectiveness of Paula method on Pelvic floor muscle strength among Obese postmenopausal women with SUI and to evaluate the effectiveness of Pilates on weight reduction among Obese postmenopausal women with SUI. **Methodology:** This experimental study consists of 30 obese women (40-65 years) diagnosed with SUI. They were randomly allocated into two groups. Group 1 (experimental group) 15 was given Paula method of exercises along with Pilates and Group 2(control group) 15 was given Paula method of exercises alone for 3 sessions per week for total duration of 6 weeks. Both the groups were measured with Anthropometric measurements and M-ISIQ before and after the study. **Results:** The subjects who were supervised to attend all sessions were shown a difference in their BMI of average of 2.412 kgm^{-2} and reduction in their body fat% of average 2.672 % & M-ISIQ of average of 4.0666. **Conclusion:** From this study it was concluded that Pilates and Paula method are effective in weight reduction and reduced the symptoms of SUI.

Keywords
Obesity-Pilates-Paula method-post maturity-fat mas

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INTRODUCTION

The International Continence society defines Urinary incontinence as involuntary uncontrolled leakage of urine due to bladder dysfunction of the locking mechanism. [2] Which are classified into Stress Urinary incontinence, Urge incontinence, Mixed Urinary incontinence, Overflow incontinence, Nocturnal enuresis, Reflex incontinence. [9]

Prevalence:

Epidemiological studies suggest that obesity is an established risk factor for causing Stress urinary incontinence. Out of 65% of the subjects were obese. In this, overall prevalence of UI was 61.2%. Obesity accounted to 70.2% of patients with mild to very severe UI.

Urinary incontinence is a common health problem among Postmenopausal women. In India, out of 601(100%) women, 19.6% reported urinary incontinence. Highest percentage were found to be

have stress urinary incontinence (10.1%) and most commonly occurs in women with the age of above 45 years (Postmenopausal). [22] In Canada, 27.6% of women were incontinent and 50% were stress urinary incontinent. [21]

Causes for SUI: Childbirth**,** Trauma, Hormonal disorders, Reduction in reproductive organs, Pelvic surgery**,** Menopause [4]

Stages of Stress urinary incontinence:

Stage1-Symptoms occurs only during major effort. Stage2-Symptoms occurs during moderate exercise such as running, lifting heavy objects or sports. Stage3-observable with minimal physical exertion such as walking, changing the position. [2]

Anatomy of Lower urinary tract:

Continence is maintained by a complex coordination between bladder, urethra, pelvic floor muscle, endopelvic fascia and the nervous system.[25]

Physiology:

Micturition is a process by which urine is voided from the urinary bladder. It is a reflex process. Micturition reflex is elicited by the stimulation of stretch receptors situated on the walls of urinary bladder and urethra. When about 300 to 400 ml of urine is collected in the bladder, micturition reflex activated. [26]

Impact of Stress urinary incontinence on obese individuals:

Obesity- Although most epidemiological studies suggest that obesity is an established risk factor for causing Stress urinary incontinence. Obesity can cause central adiposity, which increases intra-abdominal pressure. This can increase bladder pressure and urethral mobility, which can contribute to Stress urinary incontinence.

Pelvic floor stress- Obesity can stress the pelvic floor, which can lead to SUI.[13]

Impact of Stress urinary incontinence on Postmenopausal women:

Post menopausal- SUI is commonly occurs in Postmenopausal women. Estrogen is also known to have a direct effect on detrusor function through modifications in muscarinic receptors and by inhibition of movement of extracellular calcium ions into muscle cells which causes weakness of muscle. Low estrogen causes increased pressure on bladder, weak pelvic floor muscles which leads to incontinence. [11]

ICF view:

Body structure and function- Anatomical changes in bladder or urethra, Pelvic floor muscle dysfunction, Neurological damage, Endocrine system, Excretory system.

Activity limitation-ADL, Physical activity, social activity, Occupational activity.

Participation restriction-Social, Recreational, Sporting, Occupational, Emotional and Psychological.

Environmental factors:

Facilitators: Access to medical intervention and assistive devices, Supporting family.

Barriers: Lack of public toilet facilities, Limited financial resources, Stigma.

Personal factors- Depression, Anxiety, Stress.

Pilates as a treatment of Abdominal muscle strength:

Pilates is a holistic exercise system designed to elongate, strengthen and restore the body to balance; so much more than just building a 'strong core' or 'Perfect posture'. Exercises involve the whole body. An emphasis is placed on control of body position and movement, as suggested by its original name "Contrology". Traditional principles of Pilates exercise include Centering, Concentration, Control, Precision, Flow and Breathing. [7]

Paula method as a treatment of Pelvic floor muscle strength:

Paula method of exercise is a unique method based on the body's natural ability to heal itself. Exercise based on the method activates the ring muscles (also called sphincters) - the muscles located around the various body apertures that function according to the basic movements of life: the pulsating movement of contraction and release, opening and closing. Paul Garbourg, the originator and developer of the method, discovered that the various circular muscle function as one system that is mutually connected to all bodily systems.[28]

Materials and Methodology:

An experimental study which consists of 30 obese postmenopausal with diagnosed Stress urinary incontinence between the age of 40 to 65 years, were taken based on selection criteria. Women diagnosed with stress urinary incontinence, Subjects with BMI ≥ 30, Age group 40 to 65 years were included. Pregnant women, Severe cardiac/respiratory disease, Women undergone any Gynecological surgery and Previous pelvic radiation were excluded. The study was done at Department of Obstetrics and Gynecology, Adhiparasakthi hospitals and Research Institute, Melmaruvathur. Then participants were randomly allocated into two groups: Group A and Group B. Group A (15) received both Pilates and Paula method of exercises and Group B received Paula method of exercises alone. The participants received intervention foe the duration of 6 weeks. Initially consent form were given to all participants. Further Demographic details & the condition related details were received from the participants. Complete baseline assessment including pretest and posttest were collected using

the outcome measure are BMI, body fat percentage and Michigan Incontinence Symptomatic Index Questionnaire (M-ISI**).**

Treatment procedure:

In this study, the treatment procedure involved into two different exercise interventions: Pilates and Paula method of exercises. Based on ACSM and global recommendation. Frequency: 3 sessions per week, Duration: 15 – 30 minutes per session, Sets and Reps: 5 reps in 3 sets, Breaks: 30 seconds rest between each reps.

Pilates exercises – Pelvic bridging, Side leg lift, Side kick, Toe tap, Prone hip and knee extension, Leg circles, Wall squats, Scissoring, Swimming.

Paula method of exercises:

- Pubococcygeal muscles – Supine lying knees bent to the chest and instruct to contract and relax the sphincter.
- Anal sphincter- Supine lying knees bent and then contract and relax.
- Eye and eyelid – Supine lying knees bent and then contract and relax.
- Mouth and Finger – Sitting and instruct to contract and relax.

RESULTS:

Changes in BMI of the participants

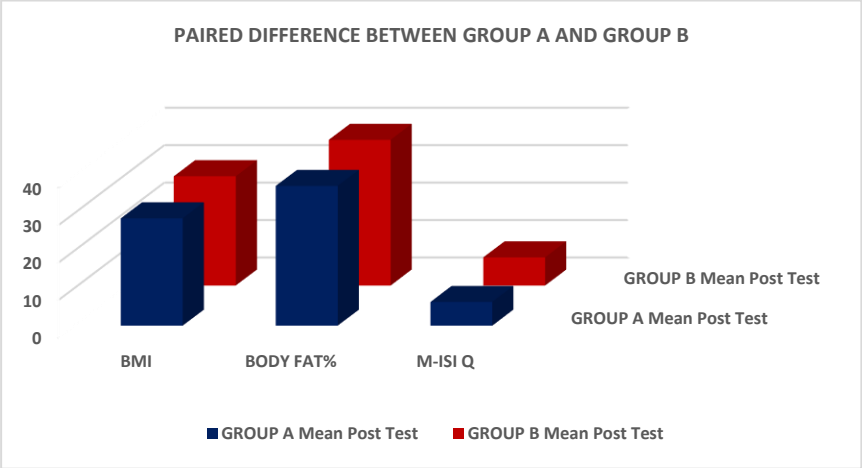
The mean ± standard deviation of group A in pre-test is 31.060 ± 1.304, in post-test is 28.648 ± 1.142 and paired difference is 2.412 ± 0.66. The mean ± standard deviation of group B (control group) in pre-test is 30.474 ± 1.553, in post-test is 29.190 ± 1.463 and paired difference is 1.284 ± 0.349.

Changes in fat percentage of the participants

The mean ± standard deviation of group A (experimental group) in pre-test is 39.994 ± 2.103, in post-test is 37.322 ± 2.170 and paired difference is 2.672 ± 0.701. The mean ± standard deviation of group B (control group) in pre-test is 39.641 ± 0.934, in post-test is 38.923 ± 0.871 and paired difference is 0.718 ± 0.370.

Changes in MISI of the participants

For Mitchigan incontinence symptomatic index questionnaire group A mean and standard deviation for pre-test is 10.400 ± 2.354, in post-test is 6.333 ± 1.988 and the paired difference is 4.0666 ± 0.798 and group B the mean and standard deviation for pre-test is 9.800 ± 2.177 and the paired difference were 2.2666 ± 0.457 and group B the mean and standard deviation for pre-test is 33.53 ± 2.19 and post-test is 33.53 ± 2.32 and paired difference 2.80 ± 0.56.



DISCUSSION:

This study has no restriction to the diet and medications of the subjects. This study proven only the effects of physical activities. The independent variables in this study are Pilates and Paula method of exercises. The dependent variables in this study are anthropometric measurements i. e, BMI, Body Fat% and Michigan incontinence symptomatic index questionnaire.

The experimental group who was supervised to attend all the sessions were shown a difference in their BMI of average is 2.412±0.661 kgm^{-2} and reduction in their body fat% of average is 2.672±0.701 % and reduction in the values of M-ISI questionnaire of average is 4.0666±0.798. The graphical data shows that there was significant difference in both the groups in dependent variables of BMI for weight, Fat% for fat and M-ISI questionnaire for SUI. Stress Urinary Incontinence has a significant effect on quality of life, affecting the social, psychological, physical and financial aspects of life.

Result from Leslee L. Suback reported that weight reduction as a first line treatment for overweight and obese women with incontinence. [19]
Therefore, Pilates helps to reduce the weight and Paula method helps to strengthen the pelvic floor muscle.

CONCLUSION:

From this study it was concluded that Pilates and Paula method of exercise is effective in reducing the symptoms of incontinence during cough or sneeze among postmenopausal women with stress urinary incontinence.

LIMITATION AND RECOMMENDATION:

- Long term effects of the treatment were not assessed due to short duration and small sample size. So, we recommended exploring the long-term effects on similar population in further research.
- The absence of control group could be considered as limitation in this study so further randomized control study could be implicated on the same treatment technique.

CLINICAL IMPLICATIONS:

From the quantitative data of this study, both the Pilates and Paula method were benefited for women with SUI. So, we encourage the application of these form of exercises to be inculcated in the regular routine protocol for the same population.

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