



A Comparative Study: Pilates And Circuit Training On Postmenopausal Women With Chronic Low Back Pain

Pooja¹, Dr. Deepak Raghav^{2*}, Dr. Tanvi Agarwal³, Dr. Kritagya Malik⁴

¹MPT, Santosh College of Physiotherapy, Santosh Medical College, Hospitals, Ghaziabad (U.P)

²Principal, Santosh College of Physiotherapy, Santosh Medical College, Hospitals, Ghaziabad (U.P)

³Associate Professor, Santosh College of Physiotherapy, Santosh Medical College, Hospitals, Ghaziabad (U.P)

⁴Assistant Professor, Santosh College of Physiotherapy, Santosh Medical College, Hospitals, Ghaziabad (U.P)

*Corresponding Author: Prof.(Dr.) Deepak Raghav

*Principal, Santosh College of Physiotherapy, Santosh Medical College, Hospitals, Ghaziabad (U.P)
deepak.raghav@santosh.ac.in

Abstract

AIM: The study aims to investigate and compare the effect of Pilates, Circuit Training, and Conventional on chronic low back pain and functional outcomes in postmenopausal women with chronic low back pain

SUBJECTS AND METHODS

Background:

Objective: Chronic lower Back Pain can impair function and affect quality of life. This study compared the effects of Pilates and Circuit Training on postmenopausal women with Chronic Lower back pain
Design: Experimental Study.

Setting: Physiotherapy Department Santosh Hospital, Ghaziabad

Participants: 30 participants (age: 45± 60 years) Individuals with more than 3 months were enrolled in this study.

Interventions: Participants were randomly assigned into 3 groups: Group A (N=10) – Pilates Training, Group B (N=10) - Circuit Training, Group C (N=10)- Conventional Therapy (duration – 30-40minutes for 6 weeks)
Outcome Measures: Visual Analogue Scale (VAS), Oswestry Disability Index

Results: The study experimented with three procedures before treatment, after 3 weeks, and after 6 weeks. Then, clinical measures were computed in the three groups. In the present study ($p < 0.05$), there is significant improvement in functional ability, ROM, and low back pain. The findings suggest that Circuit training, Pilates training, and Conventional therapy would be equally effective in treating low back pain. Also, in terms of flexion and extension circuit training would be more helpful compared to other exercises
Conclusion: The study findings revealed that training exercises like Circuit training, Pilates training, and conventional therapy were equally effective in improving low back pain, functional ability, and ROM. It was also seen that Circuit training for

<p>CC License CC-BY-NC-SA 4.0</p>	<p>Flexion and Extension was more effective compared to the other two exercises. There was a significant difference between the pre-test and post-test levels of these exercises test ($p < 0.05$)</p> <p>Keywords: <i>Chronic Low Back Pain, Exercise, Pilates, Circuit Training</i></p>
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INTRODUCTION

A frequently occurring and incapacitating condition is chronic low back pain. A musculoskeletal condition known as chronic low back pain (CLBP) is quite common among those who need medical assistance. Over 80% of people will at some point in their life encounter an episode of LBP. Over 95 % of those affected recovered within a few months after the illness started. Some, on the other hand, will stay the same better and will have persistent LBP. LBP recurrences are also prevalent; for working populations, the percentage of future LBP episodes ranges from 20% to 44% within a year to 85% lifetime recurrences. Only 15% of LBP patients can receive a clear pathoanatomical diagnosis.

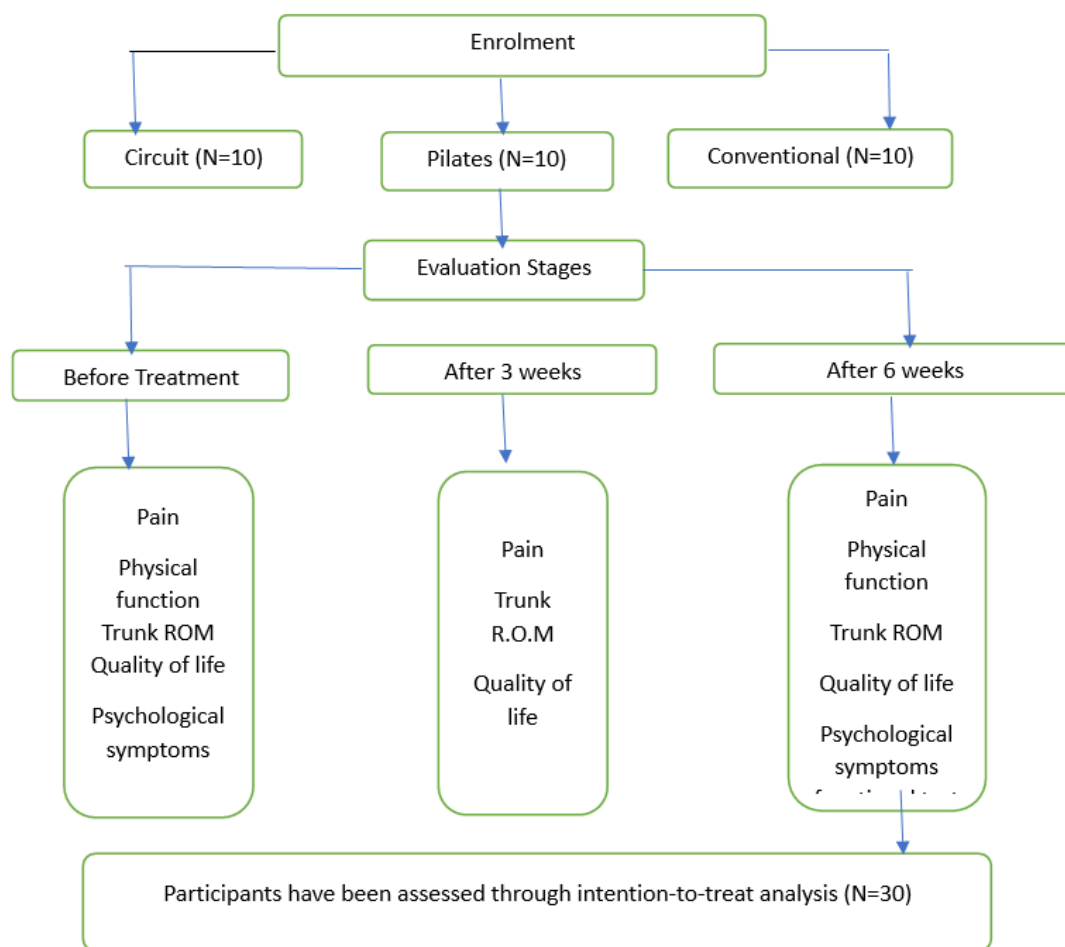
Chronic Low back pain affects large numbers of women, especially those aged 45-60. The ovaries' reduced ability to produce female hormones causes the transition from the premenopausal to the postmenopausal stage. One of the components of the estrogen is the estradiol. This sex and steroid hormone can be related to the skeletal muscle, the connective tissue, bone tissue, and tendon tissue Loss of bone and muscle mass has been attributed to the postmenopausal hormonal state. This is a normal aspect of ageing that starts slowly and spreads over time. There are many known symptoms connected to the postmenopausal era. Psychological symptoms include irritation and anxiety, mood swings, sadness, and sleep difficulties; physical symptoms include persistent fatigue, night sweats, and discomfort in the spine and joints.

According to some the experts, the development of LBP may be caused by weakening muscles such the multifidius and transversus abdominis, which would reduce spinal stability. Since the Pilates approach improves these muscles, it might be a useful treatment for lower back pain. The original Pilates philosophy combined aspects of dance, yoga, martial arts, and gymnastics with an emphasis on the connection between physical and mental discipline. A theoretical framework for neuromuscular control that expands on the idea of stability with respect to a certain spinal segment. This segmental lumbar control backdrop is then combined with broad stability principles to regulate the lumbar-pelvic region. This can be accomplished by doing hip extension while specifically activating the gluteal muscles to stabilize the lumbar-pelvic area. Therefore, an overlap of stabilization mechanisms is used to achieve trunk stability. Furthermore, low back pain patients may benefit from using Pilates equipment to practice stabilization techniques during movement. Circuit training has become a common mode of exercise, in part because of time efficiency and because lighter loads typically are implemented in such a program. circuit training consists of multiple anaerobic activities performed one after the other with little to no recovery in between. Due to its time-efficient nature and the fact that smaller weights are usually used in such programs, circuit training has gained popularity as a form of exercise. Studies have indicated that circuit training may result in a large gain in lean body weight, aerobic capacity, muscular strength, and endurance, as well as a significant decrease in body fat and resting diastolic blood pressure. These findings suggest that circuit training has a variety of positive effects on health and fitness.

Materials and Methods

Study Design

This was a comparative study, 30 participants were divided into 3 groups (N=10) a crossover trial in which clinical assessment was performed at 3 time points for each group. Each participant received a single session for 30 minutes for 6 weeks. The clinical assessments were performed before treatment, after 3 weeks, and after 6 weeks. To minimize diurnal variation on pain the time for administering the intervention was kept constant. An interval of 24 hours was provided between each intervention to minimize carryover effects. The sequence of intervention was randomly allocated. A schematic of the study design is shown in Fig. 1. All participants were informed about the study, and written informed consent was obtained from everyone.



Selection of Study Participants

Participants were selected for the study based on the following inclusion criteria: (i) Age: 45-60 of females (ii) diagnosis of 3 months of low back pain in postmenopausal women (iii) Pain due to low back VAS Score 7-6 Participants were excluded if they had: (i) presence of Neurological symptoms (iii) Premenopausal women (iv) Presence of Tumours (v) pressure ulcers; (vi) Spinal surgery or fracture; (vii) edema; (viii) contractures; and (ix) urinary tract infections. All participants were outpatients of a tertiary care hospital and were on a physical therapy rehabilitation program for 6 weeks. At baseline, the participant's gender, age, duration of low back pain in postmenopausal women, and details about analgesic medications were recorded. The clinical assessment was taken by Visual analogue scale (VAS), Oswestry disability index, and Goniometer

Intervention

Group A : (N=10)

Circuit training – Participants were asked to perform the exercises, like Squats, static lunges, shoulder bridge, standing single leg, crunches, side crunches, back raises, step up-step-down were asked to perform 15 repetitions and maintain that hold for 15 seconds each exercise has hold of 30 seconds and after circuit training 10 mins of rest was given and conventional therapy was given i.e (Ultrasound is given at 1 MHz Frequency and 1.5 W/cm intensity for 5 mins and TENS modality was given for 15 mins with 30-40Hz and Moist heat for lower back region for 15 mins)

Group B : (N=10)

Pilates Training (N=10)

Pilates training was given for 6 week training program 3 times per week. Participants were asked to perform all the valid exercises like Single leg stretch and double leg stretch, crisscross for 5 min, single leg straight side kick, front and back, side kick with small circle swimming, mermaid pill straps leg pull back and leg pull front with 3 repetitions of an exercise then move on to the next one. Each exercise will have 30 seconds of rest period. After Pilates training, conventional therapy should be given in which ultrasound, TENS, and Moist heat were applied

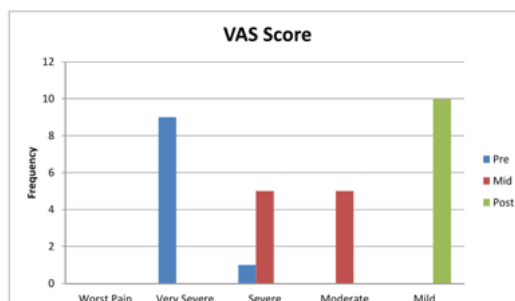
Group C : (N=10)

Participants in this group were treated with conventional therapy only for 30 minutes duration with a frequency of two treatment sessions in which ultrasound for 5 minutes TENS for 15 minutes and moist heat for 15 minutes per week for 6 consecutive weeks were applied

Data was analysed with SPSS for Windows, version 26. All analyses were two-tailed, and the level of significance was set at 0.05. Mean and standard deviations were described for continuous variables. Counting and percentages were recorded for categorical variables.

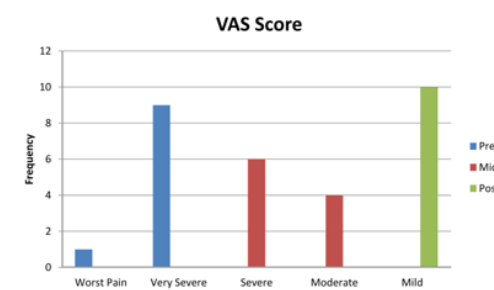
Results

	Pre	Mid	Post
Worst Pain			
Very Severe	9		
Severe	1	5	
Moderate		5	
Mild			10



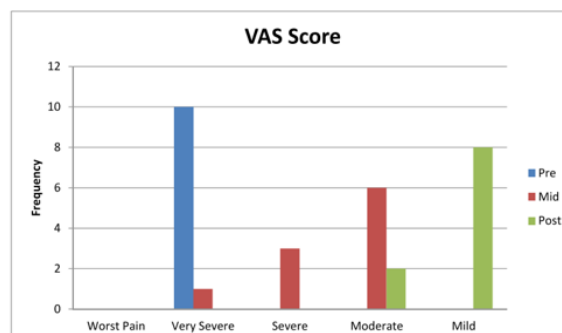
1.1 Circuit training

	Pre	Mid	Post
Worst Pain	1		
Very Severe	9		
Severe		6	
Moderate		4	
Mild			10

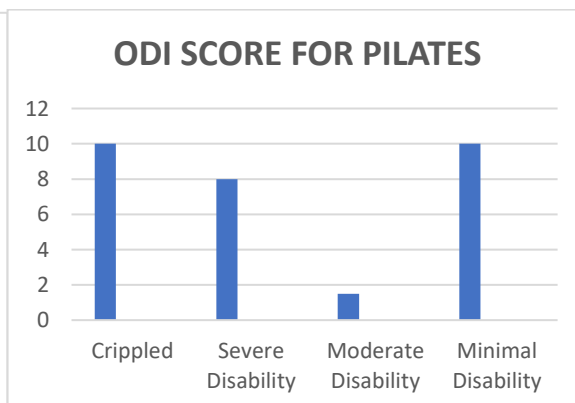
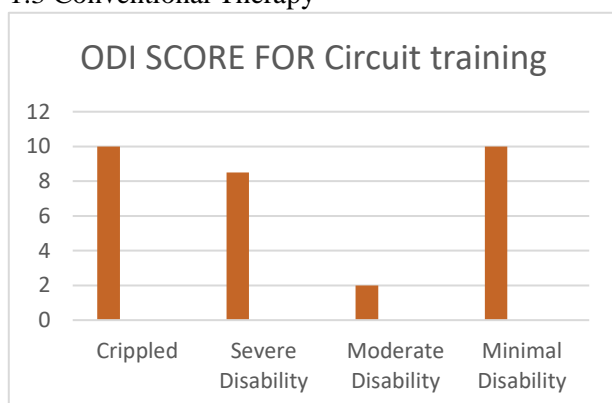


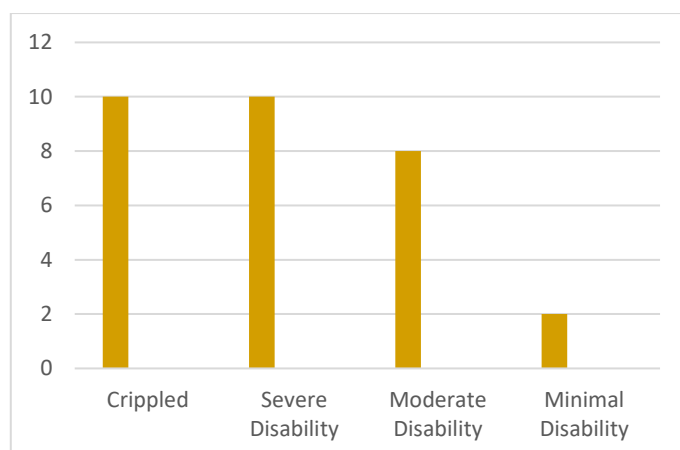
1.2 Pilates Training

	Pre	Mid	Post
Worst Pain			
Very Severe	10	1	
Severe		3	
Moderate		6	2
Mild			8



1.3 Conventional Therapy





Discussion

The present study has compared the pre-test, mid, and post-test findings of the study subjects. The findings suggest that Circuit training, Pilates training, and Conventional therapy would be equally effective in treating chronic low back pain. Also in terms of flexion-extension Circuit training would be more helpful compared to other exercises.

The findings from the present study indicate that a program of modified Pilates exercises can help to decrease pain in postmenopausal women with chronic low back pain. Furthermore, Pilates exercises can improve overall general health and increase proprioceptive balance and flexibility in participants with chronic non-specific low back pain. They all only reported moderate functional disability as indicated by baseline Oswestry scores and moderate pain levels.

No significant differences were found between the circuit training and the Pilates group in baseline data for the duration of back pain or measured physical characteristics. Despite randomization, was found to be significantly different between the groups ($P < 0.05$) with age being greater in the control group compared to the Pilates group

Previous research has shown that people with chronic low back pain typically exhibit weakening and atrophy of the "core muscles" (MF and TA). Nevertheless, rather than a lack of use, it has lately been suggested that this is caused by decreased control, resulting in aberrant spinal motions brought on by a decline in muscle coordination accuracy and proprioception.

Circuit resistance training is a form of exercise programming in which a series of exercise stations are sequentially performed—one set per station—for a prescribed number of circuit. CRT significantly increases both cardiorespiratory endurance and muscular strength in persons with chronic low back pain. In our study we found that circuit training was more effective than other two interventions

For postmenopausal women with CLBP, Pilates, circuit training, and traditional protocol/treatment were beneficial, despite this. However, when it came to exercises like single- and double-leg stretches, crisscrossing for five minutes, single-leg straight side kicks, front and back, side kicks with small circle swimming, and mermaid pill strap leg pulls back and front, the subjects in group B outperformed groups A and C in terms of functional recovery. A more methodical and progressive circuit technique B produced superior results. Furthermore, the degree of complexity in movement that the back muscles may produce ought to inhibit the use of maximal effort and workout.

Basically, compared to Pilates and traditional protocols, circuit protocol appears to offer more advantages to post-menopausal women with CLBP. The pain and disability outcomes show evidence of improvement over time, lasting two weeks after the initial treatment. It functions as a stabilizing mechanism by encouraging the intended low back movement pattern, which must be reinforced before it can be acquired, and it aids in muscle retraining by maintaining symmetry and facilitating muscles, so preventing overactivity of muscles. The circuit is a problem-solving method of therapy that uses targeted low-back muscle training to improve control and mobility.

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