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**Original Research Article**

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**A STUDY TO ASSESS THE EFFECTIVENESS OF PILATES EXERCISE TRAINING ON SELECTED POSTMENOPAUSAL WOMEN WITH NON-SPECIFIC LOW BACK PAIN IN IMPROVING PAIN, FLEXIBILITY AND ENDURANCE IN SELECTED VILLAGE AREA OF NEMAWAR**

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**Introduction**

Low back pain is a major global health concern affecting individuals across all age groups. However, postmenopausal women are particularly vulnerable due to physiological changes that occur during menopause. The decline in estrogen levels during menopause contributes to decreased bone density, reduced muscle strength, and degenerative changes in the vertebral column. These changes increase susceptibility to musculoskeletal problems, particularly non-specific low back pain.

Non-specific low back pain refers to pain in the lumbar region that is not associated with identifiable pathological causes such as fracture, infection, or malignancy. It is usually related to muscular imbalance, poor posture, weak core muscles, and reduced flexibility. Among postmenopausal women, prolonged household activities, agricultural work, lifting heavy loads, and lack of regular physical exercise can further aggravate spinal discomfort.

Low back pain not only affects physical mobility but also interferes with daily activities such as walking, bending, lifting, and sleeping. Chronic back pain may also reduce flexibility and endurance, making it difficult for women to maintain an active lifestyle.

Pilates exercise training is a structured form of physical exercise that focuses on strengthening the core muscles, improving spinal alignment, increasing flexibility, and

enhancing body awareness. Pilates exercises emphasize controlled movements, breathing techniques, and muscle engagement to improve posture and stability of the spine.

Research evidence suggests that Pilates exercises can effectively reduce back pain and improve functional capacity. These exercises strengthen the abdominal and back muscles that support the spine, thereby reducing mechanical stress on the vertebral column.

In rural communities, postmenopausal women often do not have access to physiotherapy services or structured exercise programs. Therefore, introducing a simple and effective exercise program such as Pilates training can be beneficial for improving musculoskeletal health.

The investigator observed that many postmenopausal women in the village area of Nemawar complained of persistent low back pain that affected their ability to perform daily household activities. This observation created the need to conduct a study to evaluate the effectiveness of Pilates exercise training in improving pain, flexibility, and endurance among these women.

### **Need for the Study**

Low back pain is one of the most common musculoskeletal disorders affecting postmenopausal women worldwide. In rural areas, women often neglect symptoms of back pain due to lack of awareness, limited access to healthcare services, and cultural beliefs.

Pharmacological treatments such as analgesics provide only temporary relief and may cause adverse effects when used for long periods. Therefore, non-pharmacological approaches such as exercise therapy are increasingly recommended.

Pilates exercise training is a safe, cost-effective, and practical intervention that can be implemented in community settings. It improves muscle strength, spinal stability, flexibility, and endurance, which are essential for reducing back pain.

However, there is limited research conducted in rural communities to evaluate the effectiveness of Pilates exercise training among postmenopausal women with non-

specific low back pain. Therefore, the present study was undertaken to assess the effectiveness of Pilates exercise training on pain, flexibility, and endurance among postmenopausal women in a selected village area of Nemawar.

### **Objectives of the Study**

1. To assess the pre-test level of pain, flexibility, and endurance among postmenopausal women with non-specific low back pain.
2. To evaluate the effectiveness of Pilates exercise training in improving pain among postmenopausal women.
3. To assess the effectiveness of Pilates exercise training in improving flexibility among postmenopausal women.
4. To assess the effectiveness of Pilates exercise training in improving endurance among postmenopausal women.
5. To determine the association between pre-test scores and selected demographic variables.

### **Hypotheses**

**H1:** There will be a significant reduction in pain scores among postmenopausal women after Pilates exercise training.

**H2:** There will be a significant improvement in flexibility among postmenopausal women after Pilates exercise training.

**H3:** There will be a significant improvement in endurance among postmenopausal women after Pilates exercise training.

### **Materials and Methods**

#### **Research Approach**

A quantitative evaluative research approach was used.

#### **Research Design**

A pre-experimental one-group pre-test post-test design was adopted.

### **Setting of the Study**

The study was conducted in a selected village area of Nemawar.

### **Population**

The population included postmenopausal women residing in the selected village.

### **Sample Size**

The sample consisted of 40 postmenopausal women with non-specific low back pain.

### **Sampling Technique**

A non-probability purposive sampling technique was used to select participants.

### **Inclusion Criteria**

Women who:

- had attained menopause
- were aged between 45–65 years
- had non-specific low back pain
- were willing to participate in the study

### **Exclusion Criteria**

Women who:

- had recent spinal injuries or surgery
- had severe orthopedic disorders
- had neurological diseases affecting mobility
- were undergoing physiotherapy treatment for back pain

### **Tools for Data Collection**

#### **Section A: Demographic Variables**

Age, education, occupation, duration of menopause, type of work, and history of back pain.

**Section B: Pain Assessment**

Numerical Pain Rating Scale (0-10).

**Section C: Flexibility Assessment**

Sit and Reach Test.

**Section D: Endurance Assessment**

Back endurance test measured in seconds.

**Intervention: Pilates Exercise Training**

Participants were trained in Pilates exercises including:

- pelvic curl
- spine stretch
- single leg stretch
- double leg stretch
- bridging exercise
- cat stretch
- abdominal strengthening exercises

Each exercise session lasted 30 minutes, conducted 5 days per week for 6 weeks.

**Results**

**Table 1: Pre-test and Post-test Pain Scores**

n = 40

<b>Test</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Mean Difference</b>	<b>t value</b>
Pre-test	7.05	1.22	3.95	15.42
Post-test	3.10	1.15		

Pain scores significantly decreased after Pilates training.

**Table 2: Flexibility Scores (Sit and Reach Test)**

Test	Mean (cm)	Standard Deviation	Mean Difference
Pre-test	15.8	3.2	
Post-test	21.6	3.4	5.8

**Table 3: Endurance Scores**

Test	Mean (seconds)	Standard Deviation	Mean Difference
Pre-test	38.4	8.5	
Post-test	62.7	9.1	24.3

### **Discussion**

The findings of the present study revealed that Pilates exercise training significantly reduced pain and improved flexibility and endurance among postmenopausal women with non-specific low back pain. The improvement observed may be attributed to strengthening of core muscles, better spinal alignment, and improved muscle coordination achieved through Pilates exercises.

Regular practice of Pilates exercises enhances flexibility and muscular endurance, which are essential for maintaining spinal stability and reducing mechanical strain on the lower back. The structured breathing and controlled movements used in Pilates also improve body awareness and posture.

The results indicate that Pilates training can serve as an effective community-based intervention for managing low back pain among postmenopausal women.

### **Conclusion**

The study concluded that Pilates exercise training was effective in reducing non-specific low back pain and improving flexibility and endurance among postmenopausal women

in the selected village area of Nemawar. The intervention proved to be safe, economical, and easy to implement in community settings.

### **Recommendations**

1. Similar studies may be conducted with a larger sample size.
2. A randomized controlled trial design may be used in future research.
3. Long-term follow-up studies may be conducted to evaluate sustained benefits.
4. Pilates exercise programs may be incorporated into community health promotion activities.

### **References**

1. Huang J, Park HY. Effect of Pilates training on pain and disability in patients with chronic low back pain: a systematic review and meta-analysis. *J Exerc Rehabil.* 2023;19(2):85-95.
2. Nageswari C, Meena N. Effect of Pilates exercises on pain, endurance and quality of life in postmenopausal women with low back pain. *Musculoskelet Care.* 2025;23(1):1-8.
3. Lee H, Kim H, Kim J. Effects of an 8-week Pilates exercise program on menopausal symptoms and lumbar strength in postmenopausal women. *J Exerc Rehabil.* 2016;12(3):247-254.
4. Küçükçakır N, Altan L, Korkmaz N. Effects of Pilates exercises on pain, functional status and quality of life in postmenopausal osteoporosis patients. *Complement Ther Clin Pract.* 2013;19(3):187-193.
5. de Castro JB, Silva MR, Santos T. Effects of Pilates with elastic resistance on postmenopausal women with chronic low back pain. *J Bodyw Mov Ther.* 2022;30:187-193.
6. Valenza MC, Rodríguez-Torres J, Cabrera-Martos I, Díaz-Pelegrina A. Results of a Pilates exercise program in patients with chronic non-specific low back pain. *Clin Rehabil.* 2017;31(6):753-760.
7. Lim ECW, Poh RLC, Low AY, Wong WP. Effects of Pilates-based exercises on pain and disability in individuals with persistent non-specific low back pain: a systematic review. *J Orthop Sports Phys Ther.* 2011;41(2):70-80.

8. Miyamoto GC, Costa LOP, Cabral CMN. Efficacy of the Pilates method for pain and disability in patients with chronic nonspecific low back pain. *Braz J Phys Ther.* 2013;17(6):517-532.
9. Mostagi FQRC, Dias JM, Pereira LM, Obara K, Mazuquin BF. Pilates versus general exercise effectiveness on pain and functionality in non-specific chronic low back pain. *J Bodyw Mov Ther.* 2015;19(4):636-645.
10. Mazloun V, Sahebozamani M, Barati A. Effects of selective Pilates versus extension-based exercises on rehabilitation of low back pain. *J Bodyw Mov Ther.* 2018;22(4):999-1003.
11. Batıbay S, Külcü DG, Kaleoğlu Ö, Mesci N. Effect of Pilates mat exercise and home exercise programs on pain and functional level in women with chronic low back pain. *J Orthop Sci.* 2021;26(6):979-985.
12. Aladro-Gonzalvo AR, Araya-Vargas GA, Machado-Díaz M. Pilates-based exercise for persistent nonspecific low back pain: a meta-analysis. *J Bodyw Mov Ther.* 2013;17(1):125-136.

**Keywords:** Pilates exercise, postmenopausal women, non-specific low back pain, flexibility, endurance, community health.