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## ORIGINAL ARTICLE

**COMPARING THE EFFECTS OF PILATES AND CONVENTIONAL CORE STABILIZATION EXERCISE WITH MOIST HOT PACK IN FEMALES WITH LOW BACK PAIN**

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### *Abstract*

**Background** Low back pain (LBP) has been recognized as a common condition that affects public health in adults and adolescents. Low back pain is one of the commonest musculoskeletal problems in modern society and most highly prevalent. In India nearly 60% of the population has significant low back pain at some point in life. **Objective of the study:** To compare the effects of pilates and conventional core stabilization exercise with moist hot pack in low back pain. **Methods:** 30 subjects with age group 18-25 were participated in this study. Subjects were divided in to two equal groups with 15 samples in each group. Group A performed the hundred, side bend, Swan rising pilate and Group B quadruped exercise, curl ups, Supine bridge. Both group performed the exercises for four(4) weeks. Outcome was measured before and after the treatment. **Result:** Pre-post-test within both groups found significantly effective on reducing pain and improves functional status but Group-B with conventional core stabilization showed better improvement in reduction in pain than Group-A with the pilates exercise. **Conclusion:** Conventional core stabilization exercises with moist hot pack can be used for better pain relief and faster recovery in low back pain as it helps in better recruitment of the diaphragm as a core muscles.

**Keywords:** Pilates, conventional core stabilization, moist hot pack, low back pain.

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## INTRODUCTION

Low back pain (LBP) has been recognized as a common condition that affects public health in adults and adolescents. Low back pain is one of the commonest musculoskeletal problems in modern society and most highly prevalent. In India nearly 60% of the population has significant low back pain at some point in life. Other researches conclude that it is best defined as a low level continuous or essentially continuous lumbar, sacral or lumbosacral spinal pain that is punctuated by exacerbation of pain, each of which is characterized as acute pain. In most episodes of low back pain, a specific underlying cause is not identified or even looked for, with the pain believed due to mechanical problems such as muscle strain. Skeletal issues such as sprains, obesity, smoking, weight gain during pregnancy, stresses, poor physical condition, poor posture and poor sleeping position may also contribute to low back pain<sup>1, 2, 3</sup>.

Pilates is a series of non-impact exercises designed by Joseph H. Pilates to develop strength, flexibility, balance and inner awareness. In Pilates, the central core refers to the transverse abdominis, multifidus, pelvic floor muscles and the diaphragm. In Pilates, abdominal hollowing techniques are utilized to activate this central core. In the very few studies that have been conducted using Pilates, Pilates training has been shown to result in changes in posture of the lumbar spine and cause improvements in the sensory motor control of the trunk and its relationship to limb movements. Core stability training has become a popular fitness trend that has begun to be applied in rehabilitation programs and in sports medicine. In many

studies have shown that core stability exercise is an important component for low back pain. Core stability refers to the larger superficial muscles around the abdominal and lumbar region, such as rectus abdominis, paraspinals and external oblique and local stability refers to the deep intrinsic muscles of the abdominal wall such as the transverse abdominis and multifidus<sup>4, 5</sup>.

### Background of the Study

Low back pain is an important health problem around the world. One of the most common treatments is exercise. Pilates and conventional core stabilization exercise has been a common option for treating low back pain.

**Need of the Study:** The purpose of the study is to implement the best exercise to reduce pain in patients with low back pain.

### Aim and objective of the study

- To find out the effects of Pilates.
- To find out the effects of core stabilization with moist hot pack in low back pain.
- To compare the effects of Pilates and conventional core stabilization exercise with moist hot pack in low back pain.

**Null Hypothesis:** There is no significant difference between Pilates exercise and conventional core stabilization exercise with moist hot pack.

**Alternative Hypothesis:** There is a significant difference between exercise and conventional core stabilization exercise with moist hot pack.

## METHODOLOGY

**Study Design:** comparative experimental study design study.

**Study Setting:** Study conducted at Physiotherapy department of the Vels University, Thalambur, Chennai.

**Sample Size:** 30 Subjects(15 subjects in each group).

**Study Duration:** The study was undertaken for a period of 4 weeks.

### **Inclusion criteria:**

female adults are included with age between 18-25.

Low back pain for atleast 4 weeks.

Subjects is otherwise medically fit to perform exercises.

### **Exclusion criteria:**

Back pain attributed to any other pathology like lumbar loadosis, Malignancy, Undergone any surgery [back surgery], Radiating pain in the lower limbs.[neural involvement].

### **Pain outcome measure:**

PAIN: numerical rating scale(NRS).

QUESTIONNAIRE: Modified Oswestry low back pain questionnaire.

### **Procedure:**

Subjects who fulfilling the inclusion and exclusion criteria were selected for the study. Informed consent was taken from all the included subjects before starting the study. Individuals were totally explained about the procedure.

30 participants were divided randomly into 15 for each group as Group A and Group B.

Among them Group A participants were assigned to follow the pilates excises (The hundred, side bend, swan rising pilates) and Group B were assigned to follow the core stabilization exercise (quadruped exercise, curl up, supine bridge). The set of exercises included 8 repetitions, everyday for 4 weeks. In Group B along with core stabilization exercises, moist hot pack was applied for duration of 10 mins/day, after the exercise in all the days to the lower back region<sup>6,7</sup>.

**Pre test:** These groups are assisted by modified Oswestry low back pain questionnaire for functional status and NRS (numerical rating scale) for prior to the exercise.

**Post test:** After giving 4 weeks of exercise program to both the groups, again modified Oswestry low back pain questionnaire and scale is given to be filled by the individual. Finally pre and post recordings were compared and analysed.

## EXERCISE PROTOCOL

### **Group A-Pilates:**

I. The hundred.

II. side bend.

III. Swan rising pilates.

### **Group B-Core stabilization exercise**

I. Quadruped exercise.

II. curl ups.

III. Supine brige.

### **Group-A:**

The following set of pilates exercise were followed by the individuals.

**I.The Hundred:** The subjects position is supine(crook lying),lifting both leg with knee above the hip and shin parallel to the floor. Individuals should be maintained in this postion for 10 seconds.

**II. Swan rising pilates:** Position of the subjects is prone lying, Instruct the individuals to keep hands and forearm in contact with the floor. Ask the patient to gently lengthen the thoracic spine allowing the upper part of the chest to lift off the floor. This position should be maintained for 10 seconds.

**III Side Bend:** Subjects were instructed to sit in sideways with leg bend to one side,the top foot should placed in front of the bottom foot(or stracked one on the other),place the supporting hand in line with the seated hip a few inches in front of the shoulder.

Individuals should press the supporting hand towards the mat,straighten the legs to lift the pelvis away from the mat.pressing down the both feet to lift the waist and hip towards the ceiling.

### Group-B

Moist hot pack on lower back region for 10 minutes followed by conventional core stabilization exercise.

**I.Quadrapped Exercise:** The subjects should be in a quadrapped position;keep head straight with knee bent to 90 degrees. Instruct the subjects to engage their core to keep back straight during entire excercise;using hamstring,gluteus and low back muscles to lift leg straight while simultaneously lifting opposite arm. Patient should hold in this position for 10 seconds.

**II.Curl Up:** The subjects was instructed to lie on back with knees bent and feet flat on the floor. Individuals should crunch or curl the stomach to lift shoulders just off the floor. Instruct the subjects that try not to use hip flexor muscles to carry out this movement.

**III.Supine Bridge:** Subjects should be in supine(crook lying)position,instruct the subjects to press the upper back and feet into the mat,ask them to rise the pelvis and extend the hip. This position should be maintained in this position for 10 seconds.

## RESULT

### Group-A: Pilates exercis

OUTCOME	Mean		Standard Deviation		t-VALUE	p-VALUE
	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST		
NRS	4.6	3.267	1.844	1.22	5.739	0
MOLBPQ	35.2	37.733	8.938	7.723	4.599	0

**Table 1:** Pre post test for NRS and MOLBPQ of Group A

**GROUP-B:Conventional Core Stabilization Exercise**

OUTCOME	MEAN		STANDARD DEVIATION		t-VALUE	p-VALUE
	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST		
NRS	4.533	2.630	1.1	1.685	5.739	0.00
MOLBPQ	36.733	40.4	7.392	5.289	4.534	0.00

**Table 2:** Pre post test for NRS and MOLBPQ of Grroup B

The above pre and post test mean value tables 1 and 2 shows that both the groups were effective in reducing pain and improves functional status but Group-B with conventional core stabilization shows better improvement in reduction in pain than group-A with the pilates exercise.

**DISCUSSION**

Sokunbl O,concluded that core stabilization may empower the patient with better coping strategy for dealing with the patients with low back pain<sup>8</sup>. Ligia M Pereira, The pilates methods did not improve functionally and pain in patients who have low back pain when compared with control and lumbar stabilization exercise group<sup>9</sup>. Laura schembri, this study imply that core stability exercise have a better effects on improving pain and disability over a longer period than traditional back exercise<sup>10</sup>.

Tae-lim yoon In his study state that right internal oblique,muscles activity during one leg rising,was significantly greater than that during one arm rising.In the bilateral multifidus and lumbar iliocostalis , each arm leg rising muscle activity was significantly greater than those of one leg rising and one arm rising<sup>11</sup>.

The demographic data was analyzed for both groups and significant difference was found between two groups.the baseline scores for NRS and MOLBPQ were assessed prior to administration of the intervention which showed higher values in case of the patient in low back pain for pain.The analysis of the measure for NRS between the 2 groups showed similar significant reduction pain intensity.In both groups,the pilates and core stabilization excercise showed a similar significant improvement in their numerical rating scale(NRS).

The modified Oswestry low back pain questionnaire is a sensitive outcome measure used for assessing functional outcome for patients with low back pain. The English version of the MOLBPQ has shown good reliability. Between group analysis found a significant improvement, suggesting that the conventional core stabilization exercise with moist hot pack was more effective than the Pilates programme among females.

Chronic pain carries with it a psychological component and conventional core stabilization exercise is said to have an effect on the mind and body, this may have resulted in the improvement seen in female patients with low back pain.

Subjects in the conventional core stabilization exercise showed better pain relief and faster functional restoration with no complication whereas subjects in the Pilates group showed slow recovery. Future research should concentrate on conventional core stabilization exercise with moist hot pack in treatment of low back pain and should be prescribed in a therapeutic setting in low back pain. The present study took up these suggestions to perform the exercise in low back pain subjects and found that core stabilization exercise was beneficial in these individuals.

#### **Limitation of study:**

1. In current study the sample size was small.
2. There study involves only female subjects.
3. No measurements were made to determine the compressive or shear loading on the spine during task.

#### **Recommendation of further study:**

1. This study can be used for the sports patients with low back pain.
2. Increasing the sample size in further study may give better validity than the current study.
3. The current study can be modulated and males subjects with low back pain can also be included in further studies.

#### **CONCLUSION**

Conventional core stabilization exercises with moist hot pack can be used for better pain relief and faster recovery in low back pain as it helps in better recruitment of the diaphragm as a core muscle.

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