



EFFECT OF CORE STABILITY TRAINING ON PAIN AND FLEXIBILITY IN PATIENTS WITH MECHANICAL LOW BACK PAIN

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ABSTRACT

Background & objectives: Mechanical low back pain is a common musculoskeletal disorder causing back pain in lower thoracic and lumbar region. A weak core is believed to cause alterations in the transfer of energy, resulting in reduced ADLs. Hence it is very necessary to keep your core muscles strong. The objective of this study was to find the effectiveness of core strengthening exercises training on pain and flexibility in patients with mechanical low back pain. **Methods:** Based on the inclusion and exclusion criteria, the subjects were selected in the study. Assessment of the participants was done which included Basic Demographics, History of injury, Basic Anthropometry (Height, Weight and BMI), History of the condition. Core muscle strength was assessed by flexor endurance test, side bridge test and extensor endurance test followed by assessment of pain by visual analogue scale (VAS) and JOA back pain evaluation questionnaire (JOABPEQ). Flexibility was assessed by sit and reach test. This was the pre assessment information and documented for all the participants. After 6 weeks of core stability training post assessment was done by using same assessment tests. **Results:** Core stability training plays a vital role in decreasing pain and improving flexibility in patients with mechanical low back pain. Result of the present study showed statistically significant difference between pre and post intervention. **Interpretation & conclusions:** Core stability training is effective in decreasing pain and improving flexibility in patients with mechanical low back pain.

KEYWORDS : BMI, JOABPEQ, Mechanical LBP, VAS, Core stability training, ADLs.

INTRODUCTION

Low back pain is the pain that persist in lower lumbar region of the back. It is the most frequently reported clinical symptom of orthopaedic diseases. Low back pain (LBP) is experienced by 80% of the population at least once during their lifetime.¹ It is the primary cause of work absence and permanent disability.² Approximately 10% of LBP patients present specific LBP with aetiologies such as lumbar spinal stenosis, spondylolisthesis, fracture of spine, inflammatory disease, or nerve root compression.^{3,4} A systematic review showed a higher likelihood of fracture with the presence of one or more red flags for trauma (older age, prolonged corticosteroid use, significant trauma relative to age, contusions or abrasions).⁵ The lumbar vertebrae are the largest of the vertebrae because of their weight-bearing function supporting the torso and head.⁶

Symptoms of LBP includes cyclic type of pain, pain in referred to buttocks and thighs, morning stiffness or morning pain, pain starts with movements, pain in forward flexion and while normal movement, pain becomes worse over the day, change in position helps the pain, pain relieved while lying down.⁷ Core stability training has a powerful theoretical foundation for the prevention and treatment of LBP as is evidenced by its widespread clinical use.⁸ Core muscles consider to be epicentre of the human body, stated that core stability training is the body to maintain dynamic equilibrium of the trunk as result of dynamic and external disturbances.⁹

Good core stability results in better athletic performance and better posture control and balance.¹⁰ Stable base of support acts as a transfer point for powerful extremity muscles to generate forceful dynamic contractions.¹¹

Evaluation of hamstring muscle flexibility is a standard assessment in sports medicine because less than ideal flexibility of soft tissues has been proposed as a predisposing factor for increasing the likelihood of hamstring muscle injury and low back pain.¹² The sit and reach tests are probably the most common measurement tools for evaluating hamstring and lower back flexibility and consist of the classical sit and reach test (SRT), toe touch test (TT), modified sit and reach

test (MSR), V sit and reach test (VSR), unilateral sit and reach test (USR), and back saver sit and reach test (BSSR).¹³

The plan of current study is to assess and identify mechanical low back pain patients from back pain patients. The study will help all the patients with back pain with speedy recovery. The effectiveness of the treatment will have implications on future patients care, and improved physiotherapy treatment protocol.

MATERIALS AND METHODS

Study design: Experimental study

Sample selection: Sample of convenience was used for selection.

Sample size: 100 participants.

Inclusion criteria:

Acute and Sub acute Mechanical low back pain based on the assessment and diagnosis, Age- 25 -35 Years, Gender – Male, Conscious and cooperative patients, Voluntary participation and concern for the study, Able to understand the exercise program.

Exclusion criteria:

Any systemic illness, Recent surgery or any surgical history, any neurological dysfunction, Any recent fracture and muscular injury, Cardio respiratory conditions, Psychological dysfunction or Mental health issues, Pathological disorders like tumours, herniated discs, degenerative disc diseases, vertebral fractures, TB of spine etc, Uncooperative patients, Pregnancy, Female, Chronic mechanical low back pain, Prolapsed intervertebral disc, Sciatica, Scoliosis, Kyphosis.

Outcome measures:

Pain- visual analogue scale (VAS), JOA back pain evaluation questionnaire (JOABPEQ), Flexibility- Sit and reach test (SRT).

Procedure:

Based on the inclusion and exclusion criteria, the subjects were selected in the study. Assessment of the participants was

done which included Basic Demographics, History of injury, Basic Anthropometry (Height, Weight and BMI), History of the condition, Researcher has assessed test core muscle strength by flexor endurance test, side bridge (right and left) test and extensor endurance test followed by assessment of pain by visual analogue scale (VAS and JOA back pain evaluation questionnaire (JOABPEQ). Flexibility was assessed by sit and reach test. Warm up include bridging, abdominal contractions, straight leg raise, crunches, oblique crunches, plank, hamstring raise and then cool down. Each test was demonstrated first and then subjects practiced it twice to minimize learning effects during data collection and the best score was used for statistically analysis. after 6 weeks of core stability training, post assessment was done by using same assessment tests.

RESULTS:

	MEAN	SD	T value	P value
Pre-Test	7.805	1.48254	3.68	0.0012
Post Test	2.802	0.84		

Pre and Post VAS graph

The Mean Pre-test Visual Analog Scale (VAS) was 7.802. While the post test that is after 6 week of intervention, the mean VAS was 2.802. Data was analyzed using the paired t test for intergroup comparison was found to be 3.68, and P value was 0.0012. Which shows significant improvement in the VAS was evident.

Pre test			Post test			t-value
Mean	Standard Deviation	Standard error	Mean	Standard Deviation	Standard error	-6.909
24.6500	9.5003	2.12445	27.775	9.556	2.139	

Pre and Post flexibility score

Flexibility was assessed by sit and reach test. The pre testing and post testing after the study was done. Therefore, test means of 24.6500cm and mean of post- test was 27.775cm. The SD of each testing was calculated was 9.5003 and 9.556 consecutively. The result shows significant improvement in the participants sit and reach test.

	MEAN	SD	t value	P value
Pre-Test	13.75+5.5	+1.48	2.82	0.029
Post Test	27.4+1.2	+0.84		

Pre and Post JOA score

The mean data of JOA score was obtain pre-test and Post-test. As per statistical analysis shows significant improvement on JOA score Pre and Post treatment sessions. The core strength training groups has significantly improved in pain before and after the treatment. P value was less then < 0.01 shows significant improvement in patient condition post treatment.

DISCUSSION:

Akhtar and colleagues reported the relationship between core strengthening exercises and pain at VAS, the pre-interventional mean was 9.13 and the post interventional mean was 3.08 for the group that used core strengthening exercises, Results of this study showed that both exercises proved to be effective in management of low back pain statistically but clinically there was greater pain reduction in core strengthening exercises group as compared to routine physical therapy exercises group.

Results of the current study showed that core strength training exercises are effective treatment on low back pain and flexibility and also there was statistically significant in decreasing pain and improving flexibility.

CONCLUSION:

The current study accepts the experimental hypothesis and

reject the null hypothesis. Study concludes that there is a significant effect of core stability training on pain and flexibility in patients with mechanical low back pain.

Further study suggested that the study on large sample size, effect can be assessed on mechanical back pain of specific job profile personnel. Future study can be planned on randomised controlled trials evaluate effectiveness on different treatments on low back pain and compared with advance physiotherapy management.

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