



Effect of Core Stability Exercise and Janda's approach on Postural stability and Pain in Patients with Mechanical Low Back Pain

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KEYWORDS	Abstract
Core stability, Janda's approach, Postural stability, Pain, Y balance test, Numerical pain rating scale.	<p>Background: Low back pain is caused by injury to a muscle or ligament. Common causes include improper lifting, poor posture, lack of regular exercise, a fracture, a ruptured disc or arthritis. Often, the only symptom is pain in the lower back.</p> <p>Objectives of this study: To compare the effect of core stability and Janda's approach in reduction of pain and improve postural stability in subjects with chronic low back pain</p> <p>Methodology: A quantitative approach and true experimental design was adopted. 30 patients were selected by simple random sampling. 15 patients in underwent Core Stability exercises, and 15 patients underwent Janda's approach Strengthening exercises. After intervention post test was conducted.</p> <p>Results: Mean postural stability score and mean pain score were different in both group after treatment. Results were statistically significant (p-value<0.05) after 6 weeks treatment.</p> <p>Conclusion: In the present sample, Core Stability exercises and Janda's approach Strengthening exercises has positive effect on reduction of pain and improvement of postural stability in subjects with Low back pain as measured by Y balance test and numerical pain rating scale before and after therapy. In that Core stability exercises showed greater benefit than Janda's approach.</p>

1. Introduction

Low back pain affects people at some stage about 80 to 85 % in their life. Low back pain is the major source of illness in the world. It is one of the common causes of disability in high income countries. The low back pain not only has physical, psychological, social and economic effects on the individual, it occurs depending upon the families, communities, industries and governments are enormous¹. Low back pain is a serious health problem and one of the most symptomatic causes of consulting health care system.² The low back pain is associated with trunk muscle weakness, particularly deep trunk muscles, along with poor coordination and

trunk proprioception.³ It leads to a greater risk of instability to the lumbar spine injury and decreased physical activity. The exercise therapy is the first-line treatment for management of low back pain. Exercise is the main stay of treatment prescribed by physical therapists for low back pain⁴.

Core stability is arrived in 1990's. Core stability is largely derived from the studies that proved a change in onset timing of trunk muscles in back injury and lower back pain. It facilitates contraction between abdominals and back extensors. The aim of core stability is learn to control the position of lumbar spine during dynamic movements, and then effectively recruit the trunk musculature, and to transfer loads equally, to make the



patient functionally active.⁵ Core stability is effective on balance system and dynamic surfaces in order to recruit proprioceptive and kinesthetic system. The term core stability is a generic training of abdominal and lumbopelvic region. The combination of global and local stability system has been used in the core stability^{6,7}. Core stability is a well known fitness trend that started to transcend into the sports medicine world. Pilates, yoga, Tai Chi – popular fitness programs are also follow core stability principles. Some broad benefits of core stability is to decrease the low back pain, and to preventing the injuries and to improve the athletic performance.⁸

Janda was a physiatrist and neurologist. Janda first noted the weakness of gluteal muscles in low back pain patients. Postural low back pain is often associated with imbalances in hip muscle length and strength.⁹Janda find two group of muscles based on phylogenetic development. Muscles can be classified as tonic and phasic. Patterns of weakness and tightness can be predicted in the sensorimotor systems to reach homeostasis. These changes in muscular tone create a muscle imbalance, leads to movement dysfunction. Muscles prone to tightness generally have a lowered irritability threshold and thus creating abnormal movement and may direct effect on joint surfaces that leading to joint degeneration.¹²

2. MATERIALS AND METHODS

Thirty patients were participated from the Nandha medical college and hospital has also received consent form from the participants. The participants came from various occupational backgrounds and complaints about similar mechanical low back pain. There were in the age group of 30 – 40 years. The 30 patients were classified into two groups at random, i.e. groups A and B. 15 patients in group A underwent Core stability exercises Frontal plank, Side plank, Pelvic floor exercises, Abdominal hollowing, Pelvic bridging for 30 minutes, 15 patients in this group B underwent Janda's approach Strengthening exercises: Press ups, Prone cobra's, Quadruped opposite arm/leg, Supine buttocks lift with arms at side and Stretching exercises: Hip flexor stretch, C stretch for IT band, Cat and camel, Tail wag for 30 minutes. Each exercise has 10 repetitions of 30 minutes duration per day for 3 months. This reduces the pain and improves postural stability by following the exercises. All these exercises are demonstrated to the subjects individually under the therapist's guidance. Following interventions are taught the patient and home programmes. And the patients are regularly monitored to know the accuracy of results. This research is approved by the institutional ethical committee from the Nandha

Medical College and Hospital, Erode, Tamilnadu, India before measurements began.

Statistical Analysis

The patients are regularly monitored to know the accuracy of results. Data analysis was done using an unpaired 't' test. The unpaired t-test was used to find out the statistical significance between post and post-t-test values of the Y balance test and NPRS. Means and standard deviations (\pm) were used to describe all the data, and the Paired and Unpaired 't' tests were used to see if the data were normal. To make sure there wasn't a big difference between the two groups. The effect of exercise was also looked at with an unpaired 't' test and repeated measurements (two groups, twice). The statistical test was set to be significant if $p < 0.05$.

Table 1 Data Analysis and Presentation

Parameters	Mean difference	SD	't' value	Table value	P value
Y balance test	26.04	5.81	7.32	2.15	0.644
NPRS	2	0.76	7.75	2.15	0.486

Different between the two groups

3. Results

The Paired 't' test analyses for the pre-test and post-test variable for the Y balance test for measuring postural stability in low back pain which is shown in Table I. Both groups show a significant difference between the pre-test and post-test values. The 't' value for Group A is 11.71, and the 't' value for Group B is 19.17. The Paired 't' test analyses for the pre-test and post-test variable for the pain measured by the Numerical pain rating scale are shown in Table II. Both groups show a significant difference between the pre-test and post-test values. The 't' value for Group A is 32.18, and the 't' value for Group B is 19.13. The unpaired test analyses for the Post-test variables for both the group's postural stability and pain measured by the Y balance test and numerical pain rating scale are shown in Table III. There was a significant difference shown between the Groups. Group A subjects show superior to Group B. The 't' value for the post-test variables for both groups is 7.32 and 7.75.

4. Discussion

The purpose of this study was to find out the Effect of core stability exercises and Janda's approach (stretching and strengthening) in the improvement of postural stability and reduced pain in subjects with Low Back Pain. Both groups test value shows that there was a significant reduction in postural stability and pain in Core stability exercises compared to Janda's approach



(stretching and strengthening), which was supported by studies as follows. This study showed that both exercises Proved to be effective in the management of low back pain statistically but clinically there was greater Pain reduction in the core stabilization exercise Group as compared to the Janda's approach (stretching and strengthening) group.^{13,14} A pilot randomized controlled trial conducted by Areeudomwong et al. measured the Effect of 10 10-week core stabilization programs on Pain presentation pattern, disability and activation of trunk muscles in subjects with clinical instability Of the lumbar spine. The subjects in the control group were treated with stretching of the trunk Muscles and hydrocollator therapy.¹⁵ Results of their Study indicated decreases in pain and disability in both treatment groups similar to the findings of this Study. However, the improvement in the activation Ratio of transverses abdominus and internal Oblique relative to rectus abdominus muscle was found in the subjects that were treated with core Stabilization exercise. It has been hypothesized that core stabilization exercise enhances the ability of the segmental muscles resulting in improved Function and decreased pain in subjects with chronic Nonspecific low back pain.¹⁶

Subjects allocated to the core stabilization Group demonstrated treatment. These Findings were also reported in similar studies By Koumantakis and O'Sullivan of chronic low Back pain, spondylolysis or spondylolisthesis. O'Sullivan signified that abdominal drawing in Manoeuvre (ADIM) helps in the integration of muscles Into a task by providing powerful biofeedback.¹⁷ Similar findings were also reported in another study in which ADIM aided in the stabilization of the lumbar Spinal segments during functional tasks performed in well-healthy subjects. In this study core stabilization Exercises also significantly reduced lower back The present controlled trial was aimed to find out the effectiveness of Stretching and strengthening Exercises in subjects with Postural Low Back Aches for 10 sessions in terms of pain reduction using VAS, improvement in the index of lumbar lordosis, muscle strength of abdominals and gluteals and flexibility of iliopsoas, rectus femoris, erector spinae. SWD& core muscle strengthening exercises were common conventional treatments given to both groups. Along with this, stretching and strengthening protocol was an intervention added in the control group for 10 sessions Janda's approach hypothesized that a weak muscle may merely be inhibited because of a tight or hypertonic antagonist (Sherrington's law of reciprocal inhibition). The study hypothesised that restoring muscle tension or the length of a tight muscle might spontaneously

facilitate a weak antagonist¹⁸. The normalisation of muscle tone and length should be followed by specific strengthening, movement re-education, and endurance training. Once peripheral structures are normalized, muscle balance is restored. Normal muscle tone surrounding joints must be restored. Sherrington's law of reciprocal inhibition states that a hypertonic antagonist muscle may be reflexively inhibiting its agonist. Therefore, in the presence of tight and/or short antagonistic muscles, restoring normal muscle tone and/or length must first be addressed before attempting to strengthen a weakened or inhibited muscle.¹⁹ Techniques to decrease tone must be specific to the cause of the hypertonicity. Asymmetrical stress factors should be eliminated to decrease biomechanical overload and compromise²⁰.

5. Conclusion

This study concluded that Core stability exercises and Janda's Approach (stretching and strengthening) is very effective in treating patients with Low back pain. In that Core stability exercises showed greater benefit than Janda's approach (stretching and strengthening) to improve postural stability and reduce pain in patients with mechanical Low back pain..

Ethical Permission: Nandha Medical College and hospital ,Erode. ERC letter No ERC/NCPT/184/NMCH

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Data Sharing Statement: The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publically.

Author's contribution

Prof. Saranraj. P has conceptualized the work. Dr.Rajadurai. S, Mrs.Susmitha. P, and Dr.Arun have gathered the data concerning this work. Prof Saranraj. P and Yazhili. S have analyzed the data, and necessary inputs were given towards designing the manuscript. Finally, all authors discussed the methodology and results and contributed to the final manuscript.

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