Effect of Strain Counterstrain Technique and Core Strengthening Exercises on Pain and Functional Status among Middle Aged People with Chronic Low Back Pain

P. Yamini¹, Surya Vishnuram², Kamalakannan M³, Ramana K⁴

¹Undergraduate, ²Tutor, ³Associate Professor, ⁴Assistant Professor, Saveetha College of Physiotherapy, Saveetha Institution of Medical and Technical Science, Chennai, Tamil Nadu, India.

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Abstract

Background: Low back pain (LBP) is characterized as “pain along the posterior portion of the body from the lower border of the twelfth rib to the lower gluteal folds. A technique called strain counterstrain method is used to treat musculoskeletal pain. Core strengthening exercises can also lead to significant improvements in pain reduction and functional status. The goal of this study is to find the effectiveness of strain counterstrain technique and core strengthening exercises in treating low back pain.

Methods: Total of 100 participants were chosen from Capital hospital, Vijayawada by convenient sampling. During study period from September 2022 to July 2023. A written consent form was obtained from them. After obtaining pre-test of VAS and Oswestry disability questionnaire the patients were categorised randomly into two groups. GROUP A received Strain counterstrain technique alone and GROUP B received Strain counterstrain technique with core strengthening exercises.

Result: A statistically significant difference was found between GROUP A and GROUP B as well as within the group, according to the statistical analysis performed on the quantitative data.

Conclusion: The findings of the present study demonstrate improvements in both Strain counterstrain technique and core strengthening exercises among middle aged people with chronic low back pain. However, (GROUP B) shows an extremely significant improvement compared to (GROUP A).

Key points: Strain counter strain, core strengthening exercises, chronic low back pain.

Introduction

Pain in the region of the back from the lower edge of the twelfth rib to the lower gluteal folds is referred to as low back pain (LBP).¹ Chronic low back pain (CLBP) is described as pain in the lower back that lasts longer than three months. The spine, intervertebral discs, and surrounding tissues are subjected to repetitive damage or overuse, which results in low back discomfort.² Many people have reported experiencing low back discomfort frequently, Low back pain affects 75-84% of the general population, Compared to men, women has a higher chances of persistent low back pain and age group of 42-64

Corresponding Author: Kamalakannan M, Associate Professor, Saveetha college of physiotherapy, Saveetha institute of Medical and Technical sciences, Thandalam, Chennai, India.

E-Mail: kamalakannan.scpt@saveetha.com
years saw the greatest reported rates of lower back pain for both sexes (33.3%). Mobility disability affects the majority of CLBP sufferers. Lower back pain is characterized by muscle spasms, tightness, and tingling feelings, stiffness early in the day, deficits in coordination and movement particularly in cases with pain extending to the lower extremities. If neglected, chronic low back discomfort can lead to complications. It interferes with blood pressure regulation, increasing the risk of hypertension which can result in a heart attack, stroke, or even death. Patients are typically diagnosed based on their history and additional characteristics such as Palpation: A doctor will use their hands to feel around the low back to look for any tense or spasming muscles, sensitive spots, or abnormalities in the joints. For patients with CLBP without widespread pain, moderate- to high-intensity exercise will be taken into consideration. Although the electrical modalities have not been proven to be successful interventions, massage is currently advised in both the acute and chronic stages of back pain. Spinal manipulation increases psychological wellbeing while offering modest short- and long-term relief from back pain. The positional release technique known as Strain Counterstrain (SCS) is used to treat chronic low back pain. Orthopedic problems are frequently treated with SCS. The purpose of strain-counterstrain is to unblock the lymphatic system’s pump mechanism so that it can function normally, to restore fascia to its normal state and to reduce tightness in muscles and other connective tissues. With Strain-Counterstrain therapy, joints influenced by the now-relaxed muscle operate optimally, extending the range of motion and reducing pain in the affected muscles.

Purpose

To compare the effectiveness of strain counterstrain technique and core strengthening exercises in the individual’s with chronic low back pain.

Materials and Methods

It was an experimental study conducted on 100 participants from Capital hospital, Vijayawada using Convenient sampling. The participants were separated into two equal groups based on random allocation.

Inclusion criteria:
- Middle aged persons (35 to 50 years) with chronic low back pain
- People with severe back pain (VAS score above 6)
- People with reduced Functional status (Back pain functional scale)
- Duration: Greater than 3 months (pain)

Exclusion criteria:
- Subjects With Any Fractures, Cardiovascular, Nervous, Pulmonary or Metabolic disorders were excluded
- Subjects who were not willing to participate will be excluded
- Spinal surgery
- Infection in the spine.

Outcome measure:

VAS scale & Oswestry disability questionnaire

Procedure

After acquiring participants that fit the selection criteria, A sample of 100 individuals between the ages of 35 to 50 years were selected from Capital hospital Vijayawada. They were briefed about the study and the intervention after which their informed consent was taken. Following that, they were placed into two groups, namely Group A and Group B, each having 50 participants. Demographic information, as well as the VAS and Oswestry disability questionnaire score were collected to measure the degree of pain at the start and after the completion of the fourth week. The pre-test and post-test values are compared and evaluated statistically. And comparison is done within the groups.

Treatment Protocol:

Group A: Strain Counterstrain technique

Group B: Core strengthening exercises along with strain counterstrain technique.

Exercise Regime for core strengthening exercises procedure:

1. Bird Dog:

Duration: Start with 5-10 repetitions on each side, holding the position for 5-10 seconds. Gradually
increase to 10-15 repetitions with longer holds.

- Intensity: Begin on your hands and knees, extend one arm forward while simultaneously extending the opposite leg backward, maintaining a stable core and neutral spine.

- Frequency: Aim for 2-3 sets, 2-3 times per week.

2. Cat-Camel Stretch:

- Duration: Perform slow, controlled movements, going through the range of motion for 10-15 repetitions.

- Intensity: Start on your hands and knees, arch your back up like a cat, and then lower your belly and extend your spine downward.

- Frequency: Include this stretch in your routine daily or as needed for pain relief.

3. Pelvic Tilts:

- Duration: Perform 10-15 repetitions, holding the tilt for 5-10 seconds.

- Intensity: Lie on your back with knees bent, gently flatten your lower back against the floor by tilting your pelvis backward.

- Frequency: Incorporate pelvic tilts into your routine daily or as recommended by your healthcare professional.

4. Bridge:

- Duration: Start with 10-15 repetitions, holding the bridge position for 5-10 seconds. Gradually increase to 15-20 repetitions with longer holds.

- Intensity: Lie on your back with knees bent, lift your hips off the floor, engaging your glutes and core muscles.

- Frequency: Aim for 2-3 sets, 2-3 times per week.

5. Modified Side Plank:

- Duration: Begin with 10-15 seconds on each side, gradually increasing to 30-60 seconds.

- Intensity: Start by lying on your side, resting on your forearm with knees bent, lift your hips off the ground, creating a straight line from your head to your knees.

- Frequency: Include modified side planks in your routine 2-3 times per week.

Data analysis

The collected data were tabulated and assessed using descriptive and inferential statistics. The parameter was subjected to a mean and SD calculation. The analysis of significant variations between pre- and post-test measures were done using a paired t-test. A significant change between two groups was examined using an unpaired t-test.

![Graph-1: Comparison of post-test values of Group-A and Group-B using VAS Scale](image1)

![Graph-2: Comparison of Post-test Mean of Group-A and Group-B using Oswestry Disability Questionnaire](image2)

Results

When compared with the pre-assessment, the post assessment shows there is a significant decrease in the pain by using the VAS and Oswestry Disability Questionnaire. The statistical mean value of VAS scale pre intervention was 7.04 and Oswestry Disability Questionnaire was 23.5 and the mean value of VAS scale post intervention was 5.80 and Oswestry Disability Questionnaire was 18.56 with
p value less than 0.0001. Group B the VAS scale pre intervention was 7.02 and Oswestry Disability Questionnaire was 22.5 and the mean value of VAS scale post intervention was 4.00 and Oswestry Disability Questionnaire post intervention was 14.1 with p value<0.0001. The same way the Oswestry Disability Questionnaire in both groups are analysed. The group with strain counterstrain along with core strengthening exercises shows a significant difference in the pain than the people who were given the Strain counterstrain.

The post mean value for VAS scale is 5.80 and the Oswestry disability questionnaire is 18.56 in the Strain counterstrain technique whereas the post mean value for the VAS scale is 4.00 and the questionnaire is 14.10 in the people with core strengthening exercises along with strain counterstrain technique with t values 13.7811 in VAS and 14.5395 Oswestry disability questionnaire and p value is<0.0001

Discussion

The goal of the study is to determine whether the Strain CounterStrain Technique and core strengthening exercises are useful for treating middle-aged adults with chronic low back pain. According to a recent systematic analysis, the likelihood of experiencing low back pain for the first time in a year ranges between 6.3% and 15.3%, whereas the likelihood of experiencing low back pain at any time in a year is estimated to be between 1.5% and 36%. In many parts of the world, low back pain is the primary factor in activity restriction and work absence, and it is also connected with a significant financial burden.

According to research by ChouR et al., people with chronic low back pain (CLBP) have less muscle mass and more fatty infiltration in their lumbar extensors. Although decreases in pain and impairment following Strain-Counterstrain treatment for low back pain have been documented in case studies, Lewis and Flynn et al. (2001) claimed that there is no experimental evidence to support the use of this technique for the treatment of acute low back pain.11

Core strengthening exercises are simpler for patients with CLBP. Additionally, patients can freely conduct core strength training at home without any specific equipment, which is crucial because home-based exercise regimens might provide additional advantages for determined In contrast to the control group, the group given core exercises demonstrated a greater drop in pain intensity and an increase in range of motion, according to a 2014 study.15

Some of the exercises performed include Pelvic Bridging, Plank, Cat and Camel, Bilateral Straight Leg Raise, and other exercises that strengthen the muscles surrounding the lumbar spine. Cramping is lessened as a result of them helping to improve blood circulation. Exercises that involve aerobic activity include knee lifts, diagonal toe touches, lunges, criss-cross, and others. According to Gatti et al. (2000)17, functional tasks that are a daily concern for CLBP patients are the primary basis for evaluating the severity of a disability. Thus, while being difficult exercises, core training and trunk balance training can lessen impairment.

In addition, the Strain-Counterstrain is referred tool of spinal manipulative therapy, The lumbar and sacral areas are passively positioned in various degrees of flexion, extension, lateral flexion, and rotation, according to Assen Duffy et al. in 2003, A comprehensive study found no improvement in its efficacy in treating severe low back pain.16 Thus, it is clear that for patients with chronic low back pain, core strengthening activities are superior to the Strain counter strain method. Pain was rated by participants on a 10-cm visual analogue scale, which has been shown to be valid and reliable According to Price et al 1983, Duncan et al 1989, and Price et al 1994, each participant’s pain was summarised as the mean of three ratings on the visual analogue scale: minimum pain in the last 24 hours, current pain, and maximum in the last 24 hours.18 According to a study by Wong CK and Schauer C (2004), patients were surveyed to examine the reliability and validity of Strain Counterstrain (SCS). All participants showed important pain reductions with the VAS in both muscle groups by the end of the research. The SCS organizations tended to reduce pain.19

Costa et al. established the superiority of motor control exercises over electrotherapeutic modalities used to treat chronic nonspecific low back pain. Subjects in the treatment group were treated to specific exercises targeting the activation of the transversus abdominis and multifidus. When appropriate control was developed subjects progressed to more complex functional tasks. (20)
The strain counter strain method has an advantage over other pain-relieving strategies such as the integrated neuromuscular inhibition method and manual pressure release. This finding had the same results showing that the Strain counter strain technique was beneficial in reducing pain but slightly different in results when combined with exercise therapy.21

**Conclusion**

From the results obtained in the study it can be concluded that core strengthening exercises along with strain counterstrain show significant effect on chronic low back pain among middle aged people compared to the Strain-Counterstrain technique

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**References**