

A Study is to Find Out the Effects of Dynamic Muscular Stabilization Technique (DMST) and Conventional Exercise on Pain in Patients with Mechanical Low Back Ache

M. K. Kalphidaa¹, Dr. R. Jayabharathi², Ponprakash³

¹Assistant Professor., MPT (Cardio-respiratory), Sree Abirami College of Physiotherapy, Coimbatore.
Affiliated to The TamilNadu Dr. M.G.R. Medical University, Chennai, India
Corresponding Author Email: [kalpitha.bpt\[at\]gmail.com](mailto:kalpitha.bpt[at]gmail.com)
Contact no: 9087752391

²Principal., MPT (Orthopedics), Sree Abirami College of Physiotherapy, Coimbatore.
Affiliated to The TamilNadu Dr. M.G.R. Medical University, Chennai, India
Contact no:9787110217

³BPT Internship Student, Sree Abirami College of Physiotherapy, Coimbatore.
Affiliated to The TamilNadu Dr. M.G.R. Medical University, Chennai, India
Contact no:7094591785

Abstract: ***Background:** Mechanical Low Back Ache is the most frequent complaint among people nowadays. A person with Mechanical Low Back Ache is avoids physical activities which causes disuse atrophy of the lumbar muscles and decreased strength of the muscle and causing pain. **Objectives:** The study is to compare the effect of Dynamic Muscular Stabilization Technique (DMST) and Conventional Exercises on Pain in patients with Mechanical Low Back Ache. **Subjects & methods:** A Pre-test and Post-test Quasi Experimental study design was used. A Convenient Sampling Method was used to recruit patients (N=20) diagnosed with Mechanical Low Back Ache and they were randomized into two groups. The group A was treated with Dynamic Muscular Stabilization Technique (DMST) and the group B was treated with Conventional Exercises for the period of 6 weeks. The treatment outcome was assessed by using Numeric Pain Rating Scale (NPRS). Both Paired & Unpaired 't' test was used to show the treatment effectiveness. **Result:** After 6 weeks of training period the Dynamic Muscular Stabilization Technique (DMST) scored significantly higher than the Conventional Exercises for Numeric Pain Rating Scale (NPRS). **Conclusion:** There is a significantly reduction in Pain intensity after the treatment session Dynamic Muscular Stabilization Technique (DMST) group registered a significant improvement when compared to Conventional Exercises in improving function and in relieving pain.*

Keywords: Dynamic Muscular Stabilization Technique (DMST), Conventional Exercises, Mechanical Low Back Ache, Numeric Pain Rating Scale (NPRS)

1. Introduction

Mechanical low back ache is the most frequent complaint amongst people these days. It not only affects a person medically but also socially. Low back pain is defined as pain and discomfort that are localized below the costal margin and above the inferior gluteal folds with or without leg pain. It is a very common leading cause of disability worldwide among all age groups. In India incidence of mechanical low back pain has been reported to be 23.09% and has lifetime prevalence of 65 – 85%. Low back pain affects both men and women equally, with onset most often between the age group of 30 – 50 years. Recurrent mechanical low back pain is defined as a new episode of pain that occurs after symptoms – free period of 6 months and is not an exacerbation of chronic low back ache. There are also other signs and symptoms which can be classified into non – mechanical and mechanical. Non-mechanical pain originates from inflammatory, non-organic and medical conditions whereas mechanical pains are those that are consistently influenced by movement and postures. Compared to standing posture prolonged sitting, decreases lumbar lordosis, increases low back muscle activity, disc pressure and pressure on the

ischium which are associated with occupational LBP. Individuals suffering from mechanical low back pain experience major physical, social, mental and occupational disruptions. It is argued that the impact of low back pain includes deterioration of general health and deconditioning (loss of muscle tone and weight gain, constant or episodic pain or increase in the level of pain, loss of social functioning manifested as decreased participation in social and leisure activities, family stress or loss of group and community relatedness and disruption of psychological functioning manifested through insomnia, irritability, anxiety, depression and somatic complaints. In Dynamic muscular stabilization technique (DMST) adequate dynamic control of lumbar spine forces is achieved which reduces the repetitive injury to the structures of the spinal segments and related structures. Specific stabilizing exercises with co-contraction of deep abdominal (transverse abdominals) and lumbar multifidus muscles enhance the spinal segmental support and control. In recent clinical trails these exercises have proved effective in the management of low back ache both in the short and long term. The conventional exercise causing decrease the pain and increase the strength of involved muscles.

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2. Methodology

Study design: A pre – test and post – test quasi experimental study design was used with two different interventions groups to assess the effectiveness of Dynamic muscular stabilization technique (DMST) and conventional exercises on mechanical low back pain patients.

Selection criteria:

Inclusive criteria – age group between 25 to 40 years, both males and females are included, low back pain with duration of 2 months, subjects who is willing for the study, the subjects should have moderate to severe pain with an NPRS score > 5.

Exclusive criteria – nerve root compression, subjects with Rheumatoid arthritis, recent fractures in spine / lower limb, spinal infection, congenital deformities, radiating pain, current use of any steroids or drug for back pain.

Sampling method: By convenient sampling method subjects were divided into two groups with 10 subjects in each group.

Variables: Independent variables – Dynamic muscular stabilization technique and conventional exercises. Dependent variables – numeric pain rating scale.

Method of Study: It is a quasi-experimental study design. The study was conducted at Sree Abirami Hospital, Coimbatore. The subjects who stratified all the criteria and went for the duration of 6 weeks to participate, patients had to be willing to comply with the enter study protocol. Therefore the procedures were described the purpose of the study were explained and written consent form was sought before any part of the study procedure was administered / any medication / intervention was dispensed.

3. Procedure

Dynamic Muscular Stabilization Technique (DMST):

1. Isolation and Facilitation of Target Muscle:

(a) **Abdominal Bracing** – The Subject lying in crook lying position and is instructed to draw the navel up and in towards the spine or feeling the muscle tighten at the waist. From the beginning patient learns to breathe normally while activating or holding the muscular contraction.

(b) **Abdominal Hollowing** – The Subject is in supine hook lying position and is instructed to perform abdominal hollowing by making the lower abdomen cave in with both arms elevated.



Abdominal bracing



Abdominal hollowing

2. Training of trunk stabilization under static conditions of increased load: Maintaining the above position and concentration pattern the patient is instructed to hold the position while load is added via the weight of lower limbs being moved passively into loaded positions.



One leg with knee extended



Both legs with knees flexed

3. Development of trunk stabilization during slow controlled movement of the lumbar spine: Once the stability is trained through static procedure, the movement of the trunk with appropriate activation of the supporting muscles. The first step is to produce and explore lumbo-pelvic movements and learn abdominal hollowing or bracing in quadruped position and second step is controlled loading by (a) Movement of trunk with one lower limb elevation (b). Movement of trunk with elevation of one upper limb with the diagonal lower limb.



Movement of trunk with one lower limb elevation



Movement of trunk with elevation of one upper limb with the diagonal lower limb

Conventional Exercises:

1) Bridging on the floor: The subject was asked to lie down in crook lying position with hands placed at the side of his/her body. From this position, the candidate was told to weight bear on his/ her legs and lift his/her pelvis. This position was held for a second and the same was repeated ten times for three sets.



2) Supine lying - Leg lifts: The subject in supine lying was asked to lift one leg first and hold it for five seconds and return to neutral position and repeat the same for other leg. Later both the legs were made to lift simultaneously, holding them for five seconds and bringing them back to neutral position.



3) Abdominal crunches in crook lying position: The subject in crook lying was asked to place the hands behind the head and lift the trunk upwards, rotate to either side to reach the knees and hold the position for five seconds then bring them back to neutral position.



4) Prone lying - Leg lifts: The subject in prone lying was asked to lift one leg first and hold it for five seconds then bring it to neutral position and repeat the same for other leg. Later made to lift both the legs simultaneously, hold them for five seconds, and then bring them back to neutral position.

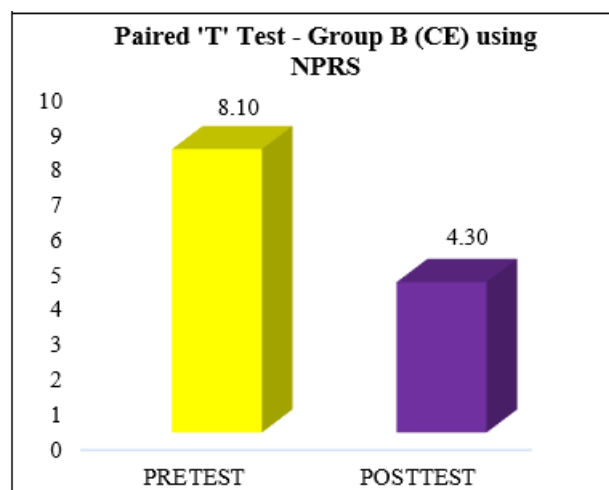
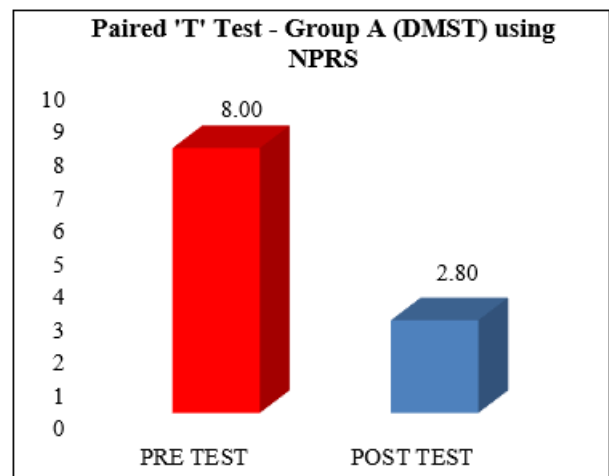


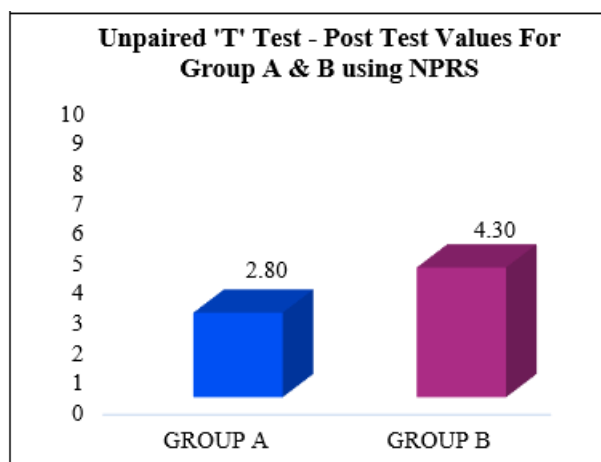
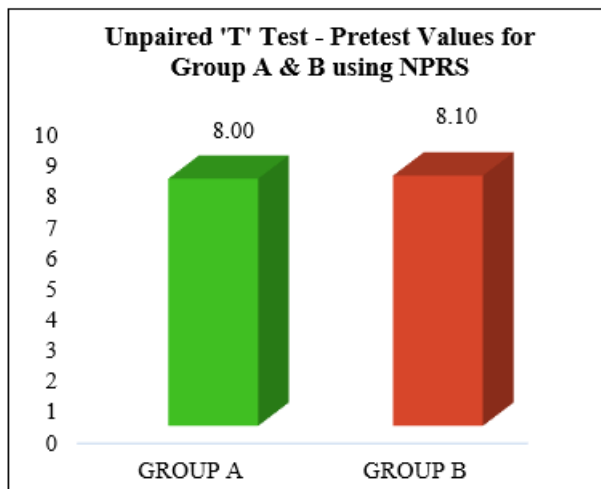
5) Prone lying - Trunk lifts: The subject in prone lying was asked to keep the hands along the side of the body, lift the trunk off the floor and hold the position for five seconds, then bringing it back to neutral position.



4. Statistical Analysis

The Collected data were tabulated and analysed using Student 't' test. Paired 't' test is used to analyses significance between Pre-test and Post-test values and Unpaired 't' test was used to analyses significance between two groups. p valve < 0.05 was considered as statistically significant.





5. Result

From the Statistical analysis made with the student 't' test, paired 't' test revealed that the mean is statistically significant between pre-test and post-test in Dynamic Muscular Stabilization Technique (DMST) group with ($p < 0.05$) and the unpaired 't' test conducted between group A & B resulted that there was a significant difference between the groups with the p value of (0.001). Thus Dynamic Muscular Stabilization Technique (DMST) has a significant role in reducing Mechanical Low back pain. The difference between the two groups was analysed using post mean values of components. In general, both the groups showed significant recently ($p < 0.05$), however Group A Dynamic Muscular Stabilization Technique (DMST) showed better reducing in pain in comparison to Group B Conventional Exercises.

6. Discussion

The aim of the study is to investigate the effect of Dynamic Muscular Stabilization Technique (DMST) and Conventional Exercise on Pain in patients with Mechanical Low Back Pain. Back pain is very common condition and at least 80% of the human race experience low back pain. 60% of the population will have experienced some degree of back pain every year. Fear avoidance was importance in causing disability in low back pain suffers about 23% have a disability and 26% has job loss. The study was to investigate the comparison between Dynamic Muscular Stabilization Technique

(DMST), yoga therapy and hot packs in improving general health status of postural low back pain patients. Results showed that Dynamic Muscular Stabilization Technique was effective in improving general health status; significant differences were found on both physical and mental health components of SF - 36 QOL. Yoga Therapy was found effective over Hot Packs. The mean improvement overall on general health status was significantly better to Dynamic Muscular Stabilization Technique. They concluded that Dynamic Muscular Stabilization Technique is an effective intervention improving general health status over a period of 1 month in patients who experience postural low back pain. The conducted the study on that Effect of dynamic muscular stabilization technique on low back pain of different durations rehabilitation of Low Back Pain with the application of Dynamic Muscular Stabilization Technique (DMST) special focus on the transverses abdominus TA and multifidi (MF) muscles which are necessary part of physical therapy management for low back pain. Previous studies warrant the need of this type of comparative study for LBP rehabilitation. Exercise programs may play an important role in muscle strengthening and prevention of future or recurrent injuries, which may have psychological benefits also. The conducted the study on that effect of core stabilization program and conventional exercise in the management of patients with chronic mechanical low back pain. The objective of the study is to find the efficacy of the concept of core stabilization when compared to conventional back care exercises in patients with chronic mechanical low back pain. Forty patients with chronic Mechanical Low back pain were selected through purposive sampling and were randomly assigned into control group who received conventional back exercises and SWD ($n=20$), experimental group who received core stabilization and SWD ($n=20$). Both the groups received SWD, along with conventional back exercises for one group and core stabilization for the other group three days a week for 6 weeks. The treatment outcome was assessed using visual analogue scale, Rolland Morris Disability Questionnaire and Lumbar range of motion using goniometer. They Concluded After the treatment sessions conventional back exercises registered a significant improvement when compared to core stabilization group exercises in improving function and in relieving pain. The conducted the study on that effects of conventional physiotherapy treatment on kinesiophobia, pain, and disability in patients with mechanical low back pain. Exercises which include back flexion and extension movements such as pelvic tilts, bridging, and static abs were effective in terms of greater reduction in pain in patients with nonspecific LBP. In the present study, it was noted that the conventional exercises focused on muscle-strength rather than postural strategies, which significantly showed improvements in patients.

7. Conclusion

In conclusion of this study has demonstrated that Dynamic Muscular Stabilization Technique (DMST) are more effective in pain reduction than Conventional Exercises in patients those who are having a Mechanical Low Back Ache.

8. Limitation and Recommendation

The study was done with small sample size. Limited to specific age group 25 – 40 years. Study was done on only Mechanical Low Back Ache. To do the study in a large population. Study duration more than 6 months. Study can be done with different age group.

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