A STUDY ON EFFICACY OF POST ISOMETRIC RELAXATION TECHNIQUE WITH MULTIFIDUS TRAINING IN LOW BACK PAIN AMONG MIDDLE AGED PEOPLE

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ABSTRACT

Low back pain is a common disorder. A common painful condition affecting the lower portion of spine which is caused by injury to a muscle or ligament. Common causes includes improper lifting, Poor posture, lack of regular exercise. Low back pain is about 10 to 25% in age group from the late teens to age 40. As middle aged people are exposed to various stresses, this age group is characterized by high incidence of so called low back pain. In rare case (<1%). low back pain is caused by serious spinal problems. Back pain can occur in any area of the back, but it is more common in the lower back, which supports most of the body's weight. Etiology of low back pain is varied. Most commonly due to a sprain or strain in the muscles and soft tissue of the back..The multifidus muscle is an important stabilizer of the lumbar spine. It functions together with transverses abdominis and pelvic floor muscle for spine stability. Multifidus muscle weakness and atrophy is associated with chronic low back pain. The multifidus muscle produce extension of vertebral column and central lateral rotation of spinal column. The multifidus is a thin muscle that plays a crucial role in the stability of the spine. The multifidus attaches at every vertebra, meaning that it is involved with the stability and health of the spine at every vertebral joint. The recondition of the multifidus is a problem because the loss of muscle mass often results in issues to the lower back and core including; Instability of the spine/trunk Poor posture, over compensation is secondary stabilizer muscle, Poor quality movement and hip/back movement patterns. The study aims to reduce the effect of low back pain in middle aged people by strengthening their multifidus muscle. The multifidus muscles will be strengthened by performing exercises in various positions to reduce the effect of low back pain in middle aged people. The parameters used are Numerical pain rating scale. Goniometry.

KEYWORDS: Low Back Pain, Middle aged women, Numerical Pain Scale, Goniometry, Multifidus muscle strengthening exercises.

AIM OF THE STUDY

The study aims to reduce the effect of low back pain in middle aged people by strengthening their multifidus muscle.

OBJECTIVE OF THE STUDY

To determine to prove the effect of The multifidus muscles strengthening by performing exercises in various positions to reduce the effect of low back pain in middle aged people.

METHODOLOGY

The Randomised Controlled Trait (RCT) is carried in the Department of Physical Medicine and Rehabilitation of Shri Indra Ganesan Institute Of Medical Science College Of Physiotherapy, were considered for study informed consent was taken from the participants and they were arranged subjected to treatment subjects were assessed for baseline data's of numerical pain rating scale and goniometry. A group of 5 members were identified as low back pain Positive straight leg rasing test and negative slump test and negative Faber's test. Their pain was assessed with numerical pain rating scale & flexibility was assessed with goniometry. The patient who has low back pain condition was treated with multifidus muscle strengthening exercise.

OUTCOME MEASURES

Numerical pain rating scale and Goniometry.

STATISTICAL ANALYSIS

The collected data will be tabulated and analyzed using descriptive & inferential statistics. To all the parameters mean and standard deviation (SD) will be used. Paired t-test will be used to analyze significant changes between pre-test & post-test measurements.

RESULTS

It explains the paired 't' test value of pre-test Vs post test 4.6 at 0.05 level of significance which was greater than tabulated 't' value of18.99.This showed that there was a significant difference between pre-test Vs post test results. The pre-test mean was7.2post test mean was 2.6 which shows the recovery of selected sample in response to intervention.

CONCLUSION

In present study, it can be concluded, that post isometric relaxation technique with multifidus strengthening is helpful in middle aged people with low back pain. The exercise can be performed without the supervision of the therapist, it can be done by the patients at their respective times. The exercise also helps in strengthening other muscle of low back in due course it can be concluded that Post isometric relaxation technique with multifidus strengthening is helpful in low back pain.

NEED OF THE STUDY

The occurence of Low back pain is higher in women than in men [1,2]. Women are affected by many chronic pain conditions of the musculoskeletal system in more numbers than men [3]. The chronic pain attributes sex differences in pain to interactions between biological, psychological, and socio cultural factors [4,5]. The pain sensitivity among women can also partially explain greater reports of pain by women compared to men [6,7]. Biologic response to pregnancy and childbearing, physical stress of child-rearing, perimenopausal abdominal weight gain are additional causes for Low back pain [1]. Population-based studies have shown that the prevalence of widespread pain increases with age, peaking in the seventh and eighth decades [8,9].

Among all chronic pain problems and spinal pain conditions, Low back pain is the most common and important clinical, social, economic, and public health problem affecting the population widely across the world [11]. Low back pain is known to be of multi-factorial causes [12, 13, 14]. Employment and workplace factors, both physical and psychological, such as heavy lifting, pushing, pulling, vehicle driving, and prolonged walking or standing were found to be predictors of LBP and there are similar associations with stressful and monotonous work and dissatisfaction with work. Body mass index has been found to be linked to Low back pain in obese people [14]. So to reduce the effect of low back pain in middle aged people can be done by strengthening their multifidus muscle.[15,16] Many other ways to reduce the back pain are there in Physiotherapy like giving the modalities like IFT, Ultrasound, TENS etc [17,18] The regular doing of spinal extension exercises and abdominal exercises, core strengthening exercises also relieves the symptoms. In this study the multifidus muscles will be strengthened by performing exercises in various positions to reduce the effect of low back pain in middle aged people. The parameters used are Numerical pain rating scale and Goniometry.

INTRODUCTION

A common painful condition affecting the lower portion of spine which is caused by injury to a muscle or ligament. Common causes includes Improper lifting , Poor posture, lack of regular exercise. Low back pain is about 10 to 25% in age group from the late teens to age 40. As middle aged people are exposed to various stresses, this age group is characterized by high incidence of so called low back pain. In rare case (<1%). low back pain is caused by serious spinal problems. Back pain can occur in any area of the back, but it is more common in the lower back, which supports most of the body's weight. Etiology of low back pain is varied. Most commonly due to a sprain or strain in the muscles and soft tissue of the back. The multifidus muscle is an important stabilizer of the lumbar spine. It functions together with transverses abdominis and pelvic floor muscle for spine stability. multifidus muscle weakness and atrophy is associated with chronic low back pain. The multifidus muscle produce extension of vertebral column and central lateral rotation of spinal column. The multifidus is a thin muscle that plays a crucial role in the stability of the spine. The multifidus attaches at every vertebra, meaning that it is involved with the stability and health of the spine at every vertebral joint. The recondition of the multifidus is a problem because the loss of muscle mass often results in issues to the lower back and core including;

Instability of the spine/trunk Poor posture, over compensation is secondary stabilizer muscle, Poor quality movement and hip/back movement patterns.

HYPOTHESIS OF THE STUDY

NULL HYPOTHESIS

The null hypothesis states that there is a no significant improvement on strengthening the multifidus muscles of middle-aged people with low back pain.

ALTERNATE HYPOTHESIS

There will be significant improvement on strengthening the multifidus muscles of middle aged people with low back pain.

METHODOLOGY

Study design: Quasi Experimental Study with pre and post evaluation

Study Setting : Shri Indra Ganesan Institute of Medical Science Physical Medicine and Rehabilitation, Tiruchirappalli

Sampling method : Convenient sampling – method

Sample size: According to prevalence rate required sample size is five participants. The convenient samples of five subjects from the middle aged women will be taken for this study. The subjects are selection form the following criteria.

INCLUSION CRITERIA

- Age group between 45 to 55
- Both Males and Females
- Low back pain whose numerical pain scale is more than 7
- low back pain people having positive straight leg raising. negative slump test and negative Faber's test

EXCLUSION CRITERIA

- Aged below 45 years and above 55 years.
- Disc prolapse.
- Osteomyelitis of spine.
- Recent fracture of vertebrae.
- Tuberculosis of spine.
- Spondylolisthesis.
- Patient who require surgical management.
- Postural abnormality.
- Inflammatory joint disease
- Osteoporosis

OUT COME MEASURES

- Numerical pain rating scale, Goniometry.

PROCEDURE

The subject referred to Shri Indra Ganesan Institute Of Medical Science College Of Physiotherapy, outpatient department were considered for study informed consent was taken from the participants and they were arranged subjected to treatment subjects were assessed for baseline data's of numerical pain rating scale and goniometry. A group of 5 members were identified as low back pain Positive straight leg raising test and negative slump test and negative Faber's test. Their pain was assessed with numerical pain rating scale & flexibility was assessed with goniometry. A brief demonstration was given about multifidus muscle strengthening exercise to the patient who has low back pain. The Pre test data and post test data was collected The results were recorded. The results of post test of the same parameter was recorded and compared.

MULIFIDUS MUSCLE STRENTHNING EXERCISE PROGRAM

1.SPINAL BRIDGING EXERCISE

The patient lies down with the back, knee in full flexion and feet flat on the floor and close to the buttock. Then the patient lifts hip off the floor towards the ceiling/sky as high as possible. Hold for 10 Seconds. Repetition for 8 times

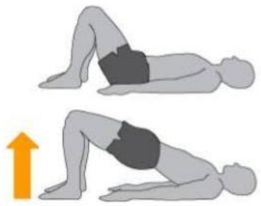


Figure: 1 Spinal bridging exercise

2. BIRDE DOG

Ask patient to balance on the floor on her hands and knee. The back should be flat and hips parallel to the floor. Instruct patient to raise right arm out in front of her and raise her opposite side left leg out behind, keeping it straight. Hold for 10 seconds and then repeat on the other side. 5 to 10 repetition for each side.

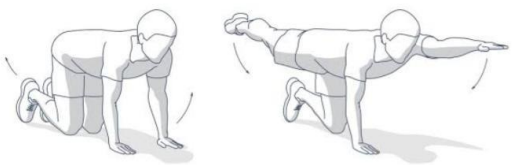


Figure : 2 Bride dog

3.SUPERMAN EXERCISE

Patient position in prone lying lie face down on him stomach with arms fully extended over him head and legs straight back. Keep him neck in a neutral position by looking straight down. Patient contract him glutes to lift him arm andlegs off the floor towards the ceiling. Stop when patient feel a flex in him lower back. Hold for 1-2 second.

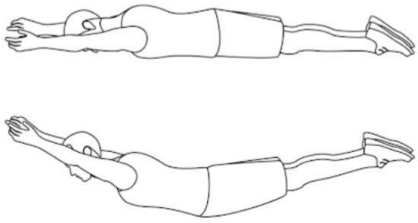


Figure: 3 Superman Exercise

4.HALF ROLL DOWN EXERCISE

Patient position supine lying. Lie flat on him back. Bend knee placing feet flat on floor. Instruct patient to exhale raising to a sitting position. Patient tough him knee with him arm and focus on tightening him stomach. Inhale bringing him shoulder to the floor. Hold for 1-3 second. Repetition for 8 times.

Figure: 4 Half roll down

5.SIDE BALANCE EXERCISE

Patient lie on the one side and correctly align pelvis and spine in neutral keeping head. Instruct patient to leg slightly raised perpendicular to the floor. Put head on one stretched arm. Other arm bent and put behind the face leaning on the floor. Instruct patient to do not turn pelvis and leg to the front.
Breath in and stretch leg forward, then breath out and recover leg back. Repeat with the other side. Hold for 10 second. Repeated for 5 times.

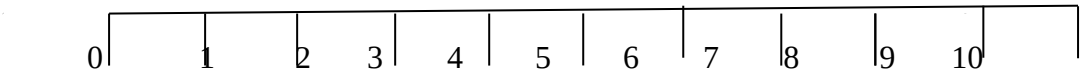
Figure: 5 Side balance

PARAMETERS : NUMERICAL PAIN RATING SCALE (NPRS)

The Numerical Pain Rating Scale a subjective measure in which individuals rate their pain on a ten point. Numerical scale. The scale is composed of 0 (No pain at all) to 10 (worst imaginable pain). It has been shown that a composite scoring system including best, worse, and current level of pain.

Pain level

- 0 - No pain
- 1 to 3 - Mild pain (nagging, annoying, interfering with ADLs)
- 4 to 6 - Moderate pain (interferes significantly with ADLs)
- 7 to 10 - Severe pain (disabling ; unable toperform ADLs)



No pain moderate pain severe pain

GONIOMETER

A Goniometer is an instrument that measures that available range of motion at a joint. The art and science of measuring the joint ranges in each plane of the joint are called goniometry. To measure the range of motion physical therapists most commonly use a goniometer. If a patient is suffering from decreased range of motion in a particular joint, the therapist can use a goniometer to assess what a range of motion is at the initial assessment, and then make sure the intervention is working by using the goniometer in subsequent.

Table: 1

Numerical Pain Rating Scale	Mean	Mean Difference	Standard Deviation	Paired‘t’values
Pre test	7.2	4.6	0.54	18.99
Post test	2.6			

The Table: 1, represent the mean value, mean difference, standard deviation and paired ‘t’ value between pre and post value of ‘Numerical Pain Rating Scale [NPRS].It explains the paired ‘t’ test value of pre-test Vs post test 4.6 at 0.05 level of significance which was greater

than tabulated ‘t’ value of 18.99.This showed that there was a significant difference between pre-test Vs post test results. The pre-test mean was7.2post test mean was 2.6 which shows the recovery of selected sample in response to intervention.

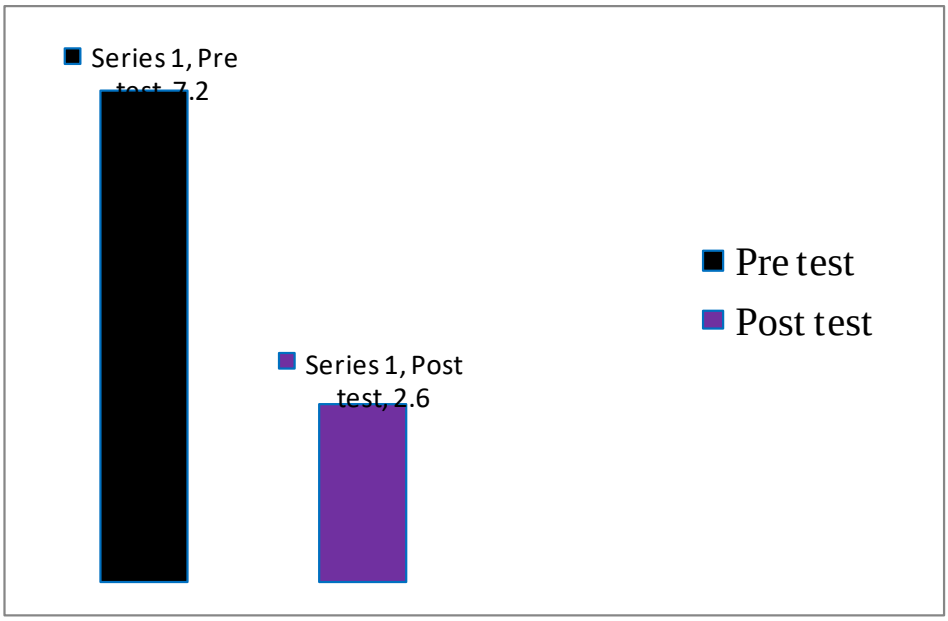


Figure: 6

The Figure - 6 explains the graphical representation of pre test and post test values of numerical pain rating scale which shows the decreased pain after the strengthening exercises given to multifidus.

Table: 2

Goniometer Scale Recording	Mean	Mean Difference	Standard Deviation	Paired‘t’values
Pre test	44	4.6	1.81	05.66
Post test	48.6			

Table 2 exhibits the Lumbar Flexion measurements of the pre and post test values measured using the Goniometer. It represents the mean difference of 4.6 and Standard deviation of 1.81.

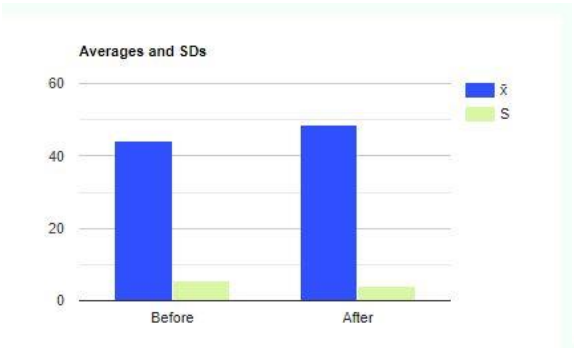


Figure: 7

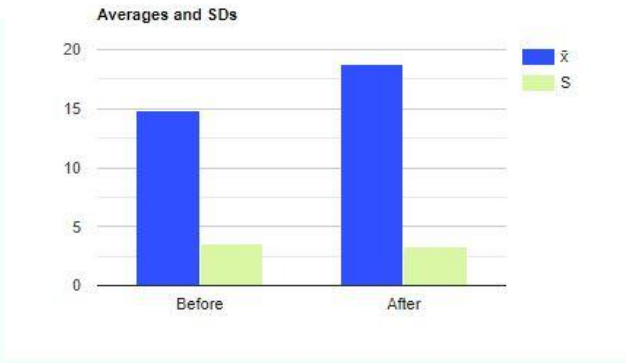


Figure: 8

The Figure 7 and 8 represents the pre and post test values of the Lumbar Flexion and Extension before doing the multifidus strengthening and after doing the multifidus strengthening. This shows that the range of motion of the lumbar region is increased after the exercise program. Compared to pre test the post test results are showing the improvement among the subjects.

Table:3

Goniometer Scale Recording	Mean	Mean Difference	Standard Deviation	Paired‘t’values
Pre test	14.8	4	1.00	08.99
Post test	18.8			

Table 3 exhibits the Lumbar Extension measurements of the pre and post test values measured using the Goniometer. It represents the mean difference of 4.0 and Standard deviation of 08.99.

DISCUSSIONS

The aim of study was to find out the multifidus strengthening exercise is improve the range of motion. A total no of five patients who had low back pain were treated with multifidus strengthening exercise in improving the range of motion. After 12 weeks a post test was conducted by Numerical pain rating scale grading and result was recorded and further statistical analysis. The analysis of result showed that there is a significant improvement for

pain relief and increase the range of motion and the patient is much more better with the relief of symptoms.

CONCLUSION

The study aims to reduce the effect of low back pain in middle aged people by strengthening their multifidus muscle. The study reveals that post isometric relaxation technique with multifidus strengthening is helpful in middle aged people with low back pain. The exercise can be performed without the supervision of the therapist, it can be done by the patients at their respective times. The exercise also helps in strengthening other muscle of low back in due course it can be concluded that Post isometric relaxation technique with multifidus strengthening is helpful in low back pain.

The multifidus muscle strengthening relieve pain, improve the range of motion, restore the muscle flexibility & spine motion to prevent rejection of the problem and improve posture. The home programs like rest, exercising regularly, avoid weight lifting and maintaining proper posture must be taught at the end of the session.

LIMITATIONS

- Sample size
- Time constraints
- A study with large sample size is recommended
- Further studies shall be done with increased duration of treatment session
- A study shall be done with different outcome measures

RECOMMENDATION

- A similar study can be done with increased repetition of exercise of multifidus muscle.
- A similar study can be conducted IFT on multifidus muscle to improve the patient with low back pain.
- A similar study can be conducted with swiss ball exercise method to low back pain.
- A similar study can be conducted with Theraband method to low back pain.

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