



## EFFICACY OF MOTOR CONTROL STABILITY EXERCISE IN CHRONIC NON-SPECIFIC LOW BACK PAIN AMONG MALE WEIGHT LIFTERS

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**ABSTRACT** The major cause of disability affecting the working population in the world is Low back pain (LBP). During weightlifting depending on the phase of the lift the loads comes on both the upper and lower extremities, with the trunk musculature serving as both primary movers and stabilizers. And as a result the back is at risk of injury due to the loading used in weightlifting. Aim is to evaluate the effectiveness of motor control stability exercise in the treatment of chronic low back pain among male weight lifters. The design is experimental design with random sampling. The Ultrasound scanning and FABQ shows the activity level and work in participants are significantly improved by decreasing the scores and an absolute reduction in pain of 100% in VAS. The findings of this support the view that the functional integration of Stability training directed at the deep muscles are effective in reducing pain and functional disability in chronic low back pain among weight lifters.

### KEYWORDS :

#### INTRODUCTION

The major cause of disability affecting the working population in the world is Low back pain (LBP). The low back is one among the top ten diseases or injuries in the world and the study done based on global burden of disease in 2010. LBP is common in adult population at least once in life span of about 85-90% and 15% of them are suffering at some point of time (Bono, 2004). LBP is very common among athletes and 85% of them are affected during their active participation in sports. Low back pain (LBP) is defined as pain localized between the 12th rib and the inferior gluteal folds, with or without leg pain. Acute NSLBP is low back pain over a period of less than 6 weeks, sub-acute NSLBP is over a period of 6 to 12 weeks and chronic NSLBP low back pain is over a period of 12 weeks or more. LBP is a common problem in our society in both work and sports or play. Weight lifting is designed such a way to give a challenge to the body. During weightlifting depending on the phase of the lift the loads comes on both the upper and lower extremities, with the trunk musculature serving as both primary movers and stabilizers. And as a result the back is at risk of injury due to the loading used in weightlifting. Lower lumbar spinal injuries are common in athletes due to the demand in their task performance and usually they damage inter-vertebral disc because of excessive weight loading. Low back pain in weight lifters are 23% which is less compared with normal active men which is about 31%. This shows the evidence that regular strengthening exercises and good lifting techniques reduces the injury rate in weight lifters than normal active men.

Motor control is not a muscle contraction, it describes the way a task is performed by movements and posture. When the movement or posture changes the motor control also gets altered and it is best explained by kinematics and synergies of muscle control (Hodges and Richardson, 1998). The brain has the function of performing a task rather than a single muscle contraction, so no muscles work in isolation.

The focus of current treatment is on stability of lumbar spine and the approach is termed lumbar stabilization, core stabilization or segmental stabilization or motor control stability exercises. Motor control stability exercises can be defined "as the restoration or augmentation of ability of the neuromuscular system to control and protect the spine from injury or reinjury". The aim of the approach is to improve the muscle strength, endurance, neuromuscular control to maintain the static and dynamic trunk and spine stability. The goal of this exercise program is to restore the deficit in motor control of the neutral zone during movements and re-establish the function of stabilizers.

#### Objectives of the study

To evaluate the effectiveness of motor control stability exercise in the treatment of chronic low back pain among male weight lifters

#### Methodology

Experimental design with random sampling  
For this study, 17 intercollegiate men weight lifters were selected as

subjects. The age of the subjects ranged from 20 to 28 years. Subjects were screened by to identify those who are unsuitable for exercise management of their low back pain because of significant comorbidity such as serious spinal pathology or contraindication to exercise. Consent has taken from the subjects prior to the study. Outcome measures are taken before the exercises programs. Variables used are Fear Avoidance belief questionnaire-Activity and work, Ultra sound scan for Right & Left Transverse Abdominis and Multifidus muscles, Visual Analogue scale-Numeric pain rating scale

The subjects included are males participants in competitive weight lifting aged from 20-28 years, CNLBP more than 12 weeks and showed as Positive prone Instability test. The subjects with Specific causes like spinal tumour, Infections, Inflammatory arthritis, metabolic diseases, progressive neurological deficits, fracture, Serious spinal pathological conditions like myelopathies, stenosis, spondylolysis, spondylolisthesis, scoliosis and spondylosis, Extra spinal conditions like Cardiovascular problems, any vascular or visceral conditions, Previous lumbar surgery excluded from the study. According to the clinical guidelines for the chronic low back pain, the structured exercise program is designed for 8 sessions of 12 weeks. The exercise administered for both groups and after 8th and 12th weeks re-administration of all outcome measures done.

#### Statistical analysis

##### 1. Ultrasound scanning

Right transverses abdominus		Pre-test	Mid-test	Post-test
	Mean	3.98	4.90	4.94
SD±	0.43	0.53	0.56	
Left transverses abdominus	Mean	4.30	5.40	5.43
	SD±	0.70	0.67	0.62
Right lumbar multifidus	Mean	25.88	29.41	30.05
	SD±	2.78	2.78	2.46
Left lumbar multifidus	Mean	25.35	27.64	28.23
	SD±	2.95	2.71	2.53

##### 2. Fear avoidance belief score-Activity & Work

Activity		Pre-test	Mid-test	Post-test
	Mean	15.76	4.70	1.29
SD±	6.45	3.23	2.33	
Work	Mean	21.64	9.23	2.05
	SD±	10.30	7.25	2.83

##### 3. Visual Analogue scale

Visual Analogue scale				
	Mean	3.82	0.47	0.23
SD±	1.55	0.94	0.56	

## DISCUSSION

### 1. Results of ultra sound scanning

The mean and standard deviation shows that there a significance difference from pre-test to post for right ( $3.98 \pm 0.43$ ,  $4.94 \pm 0.56$ ) and left transverses abdominis ( $4.30 \pm 0.70$ ,  $5.43 \pm 0.62$ ) and right ( $25.88 \pm 2.78$ ,  $30.05 \pm 2.46$ ) and left ( $25.35 \pm 2.95$ ,  $28.23 \pm 2.53$ ) lumbar multifidus.

There is a major fact about the role of Lumbar Multifidus (LM) muscle in the stabilization of the lumbar spine. Biomedical studies have enumerated the role of multifidus in the provision of segmental stiffness, control of the neutral zone and its ability to stabilize the spine when spinal stability is affected. Measurement of muscle size using ultrasound scanning machine has provided correct assessment of muscle wasting in various muscles. The results of this research showed that the use of stabilization exercise in the treatment of patients with non-specific chronic low back pain, improves lumbar multifidus muscle thickness. It also revealed that LM muscle thickness measured in the pre-intervention assessment increased significantly at 8th week post-intervention assessment across group A at L4-L5 vertebral level. This finding implies that increased contracted LM muscle was associated with greater improvement in CLBP patients with pain and functional disability.

The thickness of the right transverse abdominis during the abdominal draw-in manoeuvre, and thickness of the left transverse abdominis during the active straight leg raising manoeuvre were significantly increased

### 2. Results of Fear Avoidance belief score-Activity and Work

The results shows the activity level and work in participants are significantly improved by decreasing the scores. Activity  $15.76 \pm 6.45$ ,  $1.29 \pm 2.33$  and work ( $21.64 \pm 10.30$ ,  $2.05 \pm 2.83$ )

Musculoskeletal pain and disability are not purely influenced by mechanical factors but also by psychosocial factors. The term 'avoidance' means a postponement or getting averted because of previous experiences leading to avoidance learning. Hence pain (acute or chronic) will inhibit an individual to perform physical activity as those activities increase pain. The relationship between fear and pain was first described by Lethem in 1983.

The fear avoidance model of exaggerated pain perception in which fear and pain were both presented and associated with behaviour through avoidance learning. Fear and avoidance belief questionnaire commonly used to assess the symptoms among chronic low back pain patients to assess their return to work. The results showed participants having minimum disability. This finding further being supported by stating that FABQ scores are the most important cognitive factor for the development of chronic disability in CLBP in young adults. 3. 3. Results of Visual Analogue scale There was absolute reduction in pain of 100% from pre to post-test ( $3.82 \pm 1.55$ ,  $0.23 \pm 0.56$ )

Superiority of stabilization exercises to decrease of pain is in accordance with several studies which supported stabilization exercises are more effective than other treatment in CLBP (Goldby et al., 2006; Franca et al., 2010). McGill et al. reported that the routine exercises can create global muscle dominance over local muscle which change muscle coordination and then increase pain intensity. However SE had the ability to correct movement patterns and then decrease pain intensity. As a result, this study supported that stabilization exercises are effective exercises to reduce intensity of pain and improve functional ability in patients with CLBP.

This study was considered important on account of the fact that patients of chronic low back pain would always seek not only a relief from pain but also the ability to perform ADL without discomfort. Hence, the patients need to be trained not only for the static control but also dynamic functional independence.

The most significant finding of the present study was the sustained reduction in symptoms and functional disability levels at the 8th and 12th weeks follow up. The findings of this study support the view that a change in the motor program is such that the automatic pattern of recruitment of the abdominals to stabilize the spine during a motor task incorporated higher levels of deep abdominal muscle activity. This appears to represent an enhanced ability to stabilize dynamically their spine during functional tasks. Hence it can very well be stated that

stabilization exercises do appear to provide additional benefits to patients with sub-acute or chronic low back pain who have no clinical signs suggesting the presence of spinal instability. Therefore, such population of chronic low back pain patients must be identified and treated with specific stabilizing exercise intervention based on motor control and motor learning in order to achieve efficient relief of excessive load from the spine, to enhance segmental stabilization and to control pain in a functional manner.

### Conclusion

In conclusion, exercise can be viewed as being safe for individuals with chronic back pain. There are enough evidences suggest that regular exercises reduces the risk of chronic low back pain syndrome. It reduces the impairments and improves functions. It reduces the back pain intensity and pain related disability. The findings of this support the view that the functional integration of Stability training directed at the deep abdominals and the lumbar muscles are effective in reducing pain and functional disability in patients with chronic low back pain among weight lifters.

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