



# **Addition of Cognitive Behavioral Therapy with Motor Control Exercises on Pain and Function in Elderly Individuals with Chronic Low Back Pain**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

**Introduction:** Low back pain is a common, disabling, costly medical problem in most countries. CLBP is one of the most frequently reported conditions affecting the older adults. Numerous studies have also documented the associations of pain-related beliefs and appraisals with pain intensity and related problems, including depression, physical disability, and activity and social role limitations. Recently there is an increased attention to the role of cognitions in mood, anxiety, and other psychological disorders sparked interest in incorporating cognitive therapy techniques into behavioral therapies for chronic pain. CBT is a form of psychological therapy. It focuses on actions are the behavioral part. CBT is a feasible treatment for cognitively intact, older persons with CLBP, and may be efficacious as well. The aim of the study is to analyze the effect of cognitive behavioral therapy with Motor control exercises programme on CLBP.

**Methods:** Study is an experimental study design includes 40 patients with CLBP with more than 6 months duration. 20 participants underwent motor control exercises with moist heat pack and 20 participants underwent motor control exercises with cognitive behavioral therapy and moist heat pack. Study was conducted for 8 weeks of duration and the outcome measures were pain and disability which was measured using numerical pain scale and Oswestry disability index.

**Results:** The between group comparison was made using the unpaired t test and the results were found to be  $10.15 \pm 0.502$ , at the 95% of the Confidence intervals for disability. The between group comparison was made using the unpaired t test and the results were obtained are  $7.47 \pm 0.22$ , at the 95% of the Confidence intervals for Pain.

**Conclusion:** The study concluded that motor control exercises with cognitive behavioral therapy were significantly effective in reducing pain and disability.

*Keywords: Chronic low back pain; motor control exercises; cognitive behavioral therapy; Pain; Oswestry disability index.*

## 1. INTRODUCTION

Chronic low back pain in elders arises from age related changes in the lumbar spine and these changes were closely associated with the lifestyle of the individuals [1]. Low back pain (LBP) is the most common health problem among older adults that results in pain and disability [2]. Development of the low back pain has strongly associated with postural load conditions in elders. Prevalence of low back pain exceeded 70% of elders working in rural/mountain areas and 42% in those in city. Poor posture, irregular movement of the lumbar spine with reduction of balance between the muscles enhances the nociceptive stimuli. Motion restriction due to pain leads to the contracture of intervertebral joints and the atrophy of the other lumbar spine structures, resulting in a vicious circle of pain [3]. Older adults aged 65 years or above, are the second most common age group to visit physicians for LBP [4]. Severe LBP usually results in poor treatment outcomes and functional disability [5]. Management of low back pain is very costly and there are a large increasing proportion of health care expenditures without evidence of corresponding improvements in outcomes [6]. The study showed that the major costs of LBP can be identified with the chronic and recurrent LBP. There are different ways in the management of low back pain that has thrived through decades of physiotherapy practice like Cryotherapy, Thermotherapy, TENS, Biofeedback, Ultrasound, SWD and traction [7,8,9]. More recently a new protocol has been developed for retraining control of the stabilizing muscles around the spine and the pelvis. Spinal segmental stabilization exercises are also called as Motor control exercises which plays an important role in the management of back pain and neck pain are gaining the popularity [10]. Re-

education of postural muscles may be achieved using specific stabilization exercises. The aim of the study is to correct imbalances of activity between more deeply placed stability muscles and more superficially placed mobilizing counterparts. The motor control exercise program is based on the treatment approach aimed to improve the function of specific muscles of the low back in frequent sessions [11,12]. Behavioral Therapy (BT) and Cognitive Behavioral Therapy (CBT) for CLBP are terms for psychological interventions that often get applied interchangeably in the CLBP literature. Therapies based upon these principles seek to help the patient with pain reduce symptom intensity, regain functioning, and reduce suffering. Many techniques get incorporated into this form of therapy and rarely are single components applied in actual practice [13]. Numerous studies have conducted on the therapeutic efficacy of CBT techniques, which are a key component in most multidisciplinary/interdisciplinary pain management programs. The effectiveness of the CBT in addition to the motor control exercises was not well discussed. So this study aims to identify the effect of addition of the CBT with the motor control exercise on pain and disability in chronic low back pain in elders.

## 2. METHODOLOGY

It is an experimental study design with control group and experimental group of participants. 40 subjects with chronic low back pain more than 55 years were included in the study. All subjects were divided into two equal groups. Subjects were chosen following selection criteria include both gender with age group of 55-68 years, have low back pain more than 1-year duration, not having any neurological involvement or

cardiovascular, non-radiating pain or no weakness in the lower limb. Study was conducted for duration of 6 months. Motor control group (MCG) receives a set of exercises as per the protocol prescribed by Richardson et al. 1999. The exercises were done alternate days for 60 minutes of duration. The Cognitive behavioral therapy group (CBTG) receives a set of instructions which was prescribed based on protocols and motor control exercises for 60 minutes. Both the groups underwent moist heat therapy for 10 minutes. The individual participants underwent 8 weeks of exercise programme. Outcome measures are pain and functional disability, Pain was assessed using visual analog scale and functional disability was assessed using Oswestry disability index [14].

### 3. RESULTS

Data analyzed using SPSS 20.1. Student 't' test was used to find out the difference between the groups, paired 't' was used to find out the difference between pretest and posttest between groups, whereas Unpaired 't' test was used to find out the difference between Posttest variables between the groups. The values were calculated using the paired t test to compare the values within the groups. The values of the disability measured by the Oswestry disability index for the Group A are  $19.52 \pm 0.540$ , at the 95% of the Confidence intervals. The results of the study show that there was a significant difference obtained between the pretest and the posttest values. Same analysis was conducted for the Group B participants and the values were  $23.89 \pm 0.647$  at 95% of CI. The between group comparison was made using the unpaired t test and the results were found to be  $10.15 \pm 0.502$ , at the 95% of the Confidence intervals. Fig. 1 shows the graphical representation of the disability scores.

The values were calculated using the paired t test to compare the values within the groups. The values of the pain values measured by the numerical pain rating scale for the Group A are  $8.37 \pm 0.22$ , at the 95% of the Confidence intervals. The results of the study show that there were significant differences obtained between the pretest and the posttest values. Same analysis was conducted for the Group B participants and the values were  $19.71 \pm 0.19$ , at the 95% of the Confidence intervals. The between group comparison was made using the unpaired t test and the results were obtained are  $7.47 \pm 0.22$ , at the 95% of the Confidence

intervals. GraphII shows the graphical representation of the pain scores.

### 4. DISCUSSION

Like among young adults, the majority of LBP among older adults has no definite pathology. These patients experience LBP that is altered by posture, activity, or time of the day. Non-specific LBP may originate from different pain sources. Many older patients with chronic LBP display physical findings. Therapeutic exercise should be prescribed based on specialist evaluation of the pain reduction achieved by medication. Motor control exercises are multi component exercise program that aims at improving strength, flexibility and endurance. These active form of exercises are designed to strengthen muscles, to support the spine and helps to prevent low back pain [15]. Studies have supported that segmental stabilization and muscular strengthening in chronic low back pain. They suggested that both techniques were effective as they decreased pain and reduced disability [16]. Cognitive functional therapy helps people to identify abnormal patterns of posture and focusing on changing it so it enhances the effect of traditional rehabilitation of pain. Also, it replaces abnormal thoughts with more constructive ways of thinking [17]. The level of body control and awareness (body perception), as well as their ability to relax their trunk muscles and normalize pain provocative postural and movement behaviors are the main target of cognitive functional therapy and has an effect on pain management [18]. The significant decrease in back pain with more evidence in pain reduction in group B than in group A might attributed to cognitive functional therapy as it directly challenges the behaviors in a cognitively integrated, functionally specific and graduated manner. As in group B the study focused on changing the posture by cognitively awareness of it and also cognitively changing the perception of pain by focusing on good perception of it and posture after the treatment program [19]. Group A and Group B participants underwent motor control exercises where both the groups has produced significant improvement as similar to the study [20]. Similar studies postulated that the co-contraction of the TrA and LM muscles is the basis of the lumbo-sacral biomechanical stability and that these muscles act by reducing the compressive overloads, attenuating or eradicating pain perception [21]. The outcomes of the current study is also found that even after pain remission in patients with low back pain,

proper deep muscle reestablishment often did not happen and that specific physical therapy focusing on those muscles was necessary [22]. The limitation of the study includes a small number of participants and the follow up was not

made after the study, personal hygiene, activities are not under the control, the study not used any modalities, and there is no particular work population selected [23].

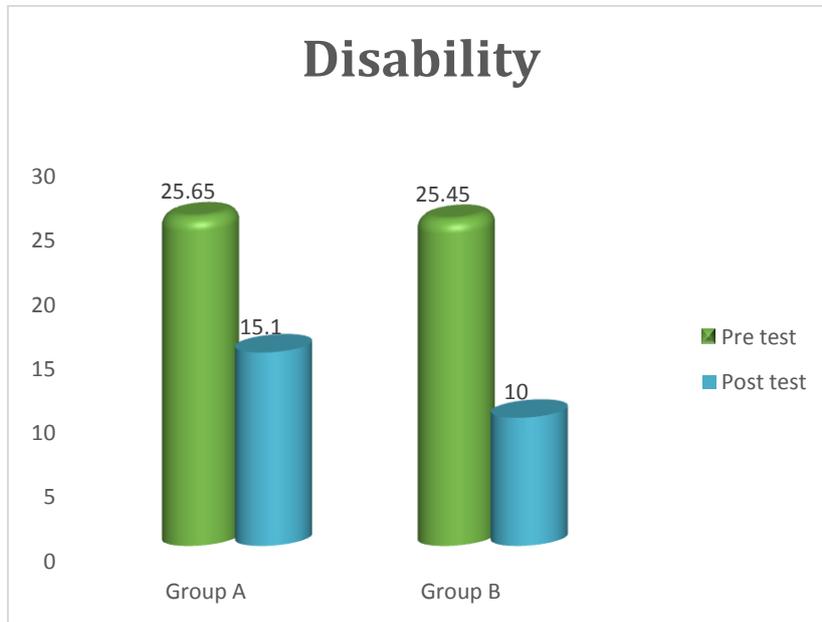


Fig. 1. Disability of respondents

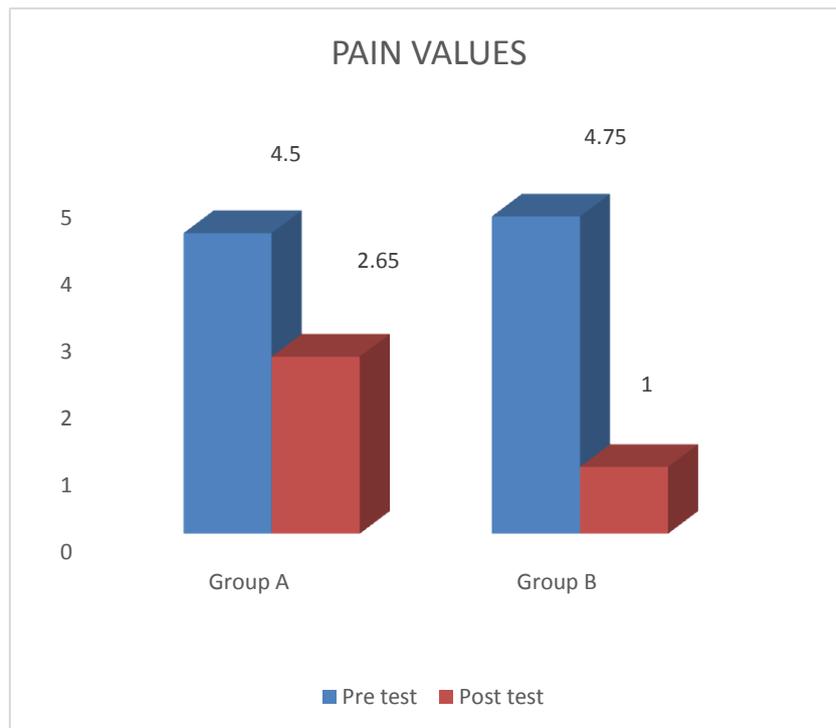


Fig. 2. Pain values of respondents

## 5. CONCLUSION

The study concluded that motor control exercises with cognitive behavioral therapy were significantly effective in reducing pain and disability.

## CONSENT

A brief explanation was given to all the participants and consent was obtained from every individual.

## ETHICAL APPROVAL

Study was accepted by institutional ethical committee and preserved by authors.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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