

Efficacy of Mckenzie Approach and Conventional Physiotherapy Protocol in Reducing Pain and Disability in Subjects with Postural Low Back Pain

Mohammad Shariful Islam¹, Md Monoarul Haque^{2*}, Rokshana Irin³

¹Physiotherapy Consultant, IBN SINA D. LAB, Doyagonj, Dhaka

²Publication Secretary, Bangladesh Physiotherapy Association

³Consultant Physiotherapist, The Barakah Hospital Ltd., Dhaka

***Corresponding Author:** Md Monoarul Haque, Publication Secretary, Bangladesh Physiotherapy Association.

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Abstract

Background: Low back pain is one of the most common symptoms experienced by people throughout the world. There are three mechanical syndromes in the McKenzie approach: Postural Syndrome, Dysfunction Syndrome, and the Derangement Syndrome. Each mechanical syndrome will respond to a different treatment approach.

Objective: To find out efficacy of Mckenzie approach and conventional physiotherapy protocol in reducing pain and disability in subjects with postural low back pain was aim of this study.

Methods: It was experimental study conducted over a period of 6 months. Total 100 subjects with non-specific back pain were selected by using simple random sampling. Visual Analogue Scale (VAS) and Oswestry low back pain disability questionnaire were used. Unpaired and paired t test were used to test efficacy between two groups.

Results: There was significant effect of McKenzie approach and strengthening exercises in reduction of pain. Study found significant effect of Mckenzie approach and sstrengthening exercises in improvement of function.

Conclusion: McKenzie approach is very effective in treating patient with postural low back pain and it results in significant improvement of functional activities and relieving pain.

Keywords: Postural Low Back Pain; McKenzie approach; Conventional Physiotherapy

Background

Low back pain is a common complaint among adult populations. Impairments of the back and spine are the most frequent causes of chronic limitation of physical activity among persons under 45 years of age [1]. Hard work and excessive lifting strains have caused injury through the millennia. In recent years more subtle stresses i.e. static and faulty postures are the usual root of back trouble. Today's lifestyle, more than any other in history, creates an insidious strain on the back, stressing the soft tissues and predisposing them to injury [2]. The life time prevalence of low back pain has been estimated at 60-70% internationally [3]. A telephone survey conducted in New Zealand found the annual incidence of back pain at 63.7% and total prevalence at 79% [4]. Many Physicians prescribe McKenzie treatment when referring a patient to physical therapy for spinal pain. McKenzie exercises are often mistakenly associated only with back bends or spinal extension exercises. The McKenzie approach is a comprehensive spinal assessment for patients with "non-specific" LBP. This approach utilizes a well defined clinical algorithm to classify patients into a mechanical syndrome. Placement into a mechanical syndrome is based on a "cause and effect" relationship between the patient's history as well as the patient's symptom response to repeated test movements, test positions, and auxiliary tests during the assessment process. There are three mechanical syndromes in the McKenzie approach: Postural Syndrome, Dysfunction Syndrome, and the Derangement Syndrome. Each mechanical syndrome will respond to a different treatment approach. Patients that fail to enter one of the three mechanical syndromes are tested by a series of auxiliary tests. In

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this study efficacy of McKenzie approach is compared with ultrasound and spinal strengthening exercises in treating of postural low back pain in subjects with postural low back pain.

Methods

It was experimental study conducted over a period of 6 months at Islami Bank Central Hospital, Kakrail, Dhaka and Ibn Sina D. Lab, Doyagonj, Dhaka. Total 100 subjects with non-specific back pain were selected by using simple random sampling after due consideration of the inclusion and exclusion criteria. Visual Analogue Scale (VAS) and Oswestry low back pain disability questionnaire were used.

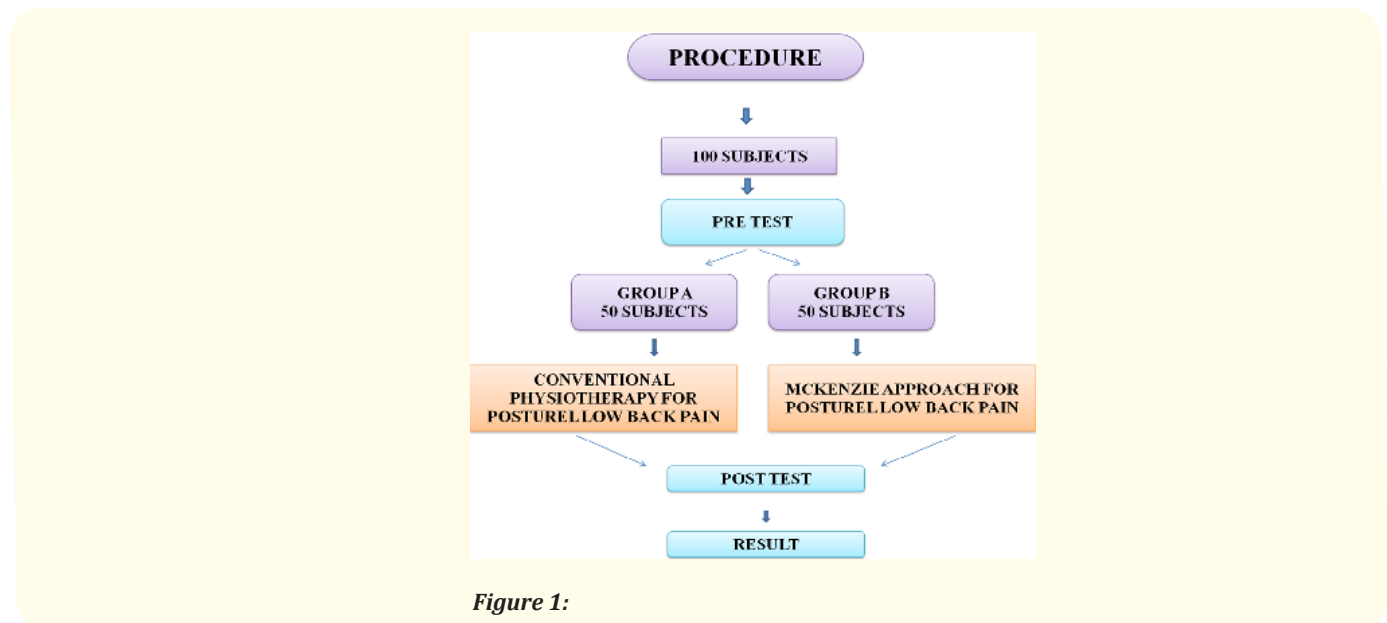


Figure 1:

A clear explanation of the study was given to the selected patients and informed consent was obtained from the patients who agreed to participate. The subjects were positioned comfortably and assessed thoroughly about his/her condition. Pain and function measures were taken at the beginning, first day of treatment and at the end of the fourth week.

50 subjects (Group A) were treated with

1. Ultrasound - 1.5 w/cm square for 5 mins over lower back
2. Strengthening exercises of the back – back extension in prone lying (sustained for 10 repetition, 3 times a day)
 - A. Frequency of treatment: once a day.
 - B. Treatment duration: 4 weeks

50 subjects (Group B) were treated with Mckenzie Approach

Mckenzie approach of postural low back pain, patient education and postural correction. Patient adopts the posture that produces their symptoms. Instructs patient how to abolish symptoms by correcting the posture and provides explanation on the mechanism that produces pain of postural origin. Attainment of the corrected posture is taught through the use of the “slouch-overcorrect” exercise. First patient adopts full slouched position – 0% or extreme of bad then move to 100% or extreme of good by rolling pelvis forwards and raising the chest. Repeat for 20 times slowly from one position to other – feel difference between two positions. Then drops back from 100% to 90% and maintain this for 5 minutes without dropping any further towards a slouched position. Manual assistance may need to active movement in order to guide the patient in moving correctly from slouched to overcorrected position. The therapist gently pulls the patient’s waistline forwards and up while preventing patient’s torso moving forwards. Correction of poor standing posture by tilting

pelvis backwards and raising the chest. Therapist place finger into sternal notch – “lift your chest up into my finger”. Therapist other hand placed over the patient’s lumbosacral area to provide stimulus to reduce lumbosacral extension. Patients are taught how to maintain the corrected posture through the use of a Lumbar roll and actively when a lumbar roll can-not be used. Consequences of postural neglect are discussed.

Muscle strengthening and stabilization: Lastly, the subjects will receive muscle strengthening exercises of the lower back. The patient will be asked to extend back in prone lying position, first with hand support then without hand support to increase muscle power. The contraction will be sustained for 10 seconds and 10 repetitions.

1. Frequency of treatment: once a day, for 3 days a week
2. Treatment duration: 4 weeks

Paired ‘t’ test was used to compare the pre-test and post-test values of visual analogue scale for pain and functional disability. The Unpaired ‘t’ test was used to compare the pre test and post test values of group A and group B for visual analogue scale and functional disability.

Results

Visual Analogue Scale for Pain Paired ‘t’ Test: Group - A (Conventional Physiotherapy Protocol)

The comparative mean values, standard deviation and Paired‘t’ test values of Group - A who were treated with ultrasound and strengthening exercises.

Group A	Mean	Standard Deviation	‘t’ Value
Pre test	7.94	0.84	46.10
Post test	3.36	0.66	

Table 1:

The table 1 shows analysis of VAS on paired‘t’ test. Using Paired‘t’ test with 49 degrees of freedom and 5% level of significance, the tabulated ‘t’ value is 2.145 which was lesser than the calculated ‘t’ value 46.10. This test showed that there was significant effect of ultrasound and strengthening exercises in reduction of pain.

Visual Analogue Scale for Pain Paired ‘t’ Test of Group - B (Mckenzie Approach of Postural Low Back Pain and Strengthening Exercise)

The comparative mean values, standard deviation and Paired‘t’ test values of Group B who were treated with Integrated Neuromuscular Inhibition Technique.

Group B	Mean	Standard Deviation	‘t’ Value
Pre test	7.98	0.82	39.26
Post test	2.06	0.84	

Table 2:

The table - II shows analysis of VAS on paired‘t’ test. Using Paired‘t’ test with 49 degrees of freedom and 5% level of significance, the tabulated ‘t’ value is 2.145 which was lesser than the calculated ‘t’ value 39.26. This test showed that there was significant effect of McKenzie approach and strengthening exercises in reduction of pain.

Visual Analogue Scale for Pain Unpaired‘t’ Test - Comparison between Pre Test Values of Group-A and Group-B

The comparative mean values, standard deviation and Unpaired‘t’ test values of Group-A and Group-B.

Group	Mean	Standard Deviation	't' Value
Group A	7.94	0.84	0.24
Group B	7.98	0.82	

Table 3:

The table 3 shows analysis of VAS on unpaired't' test. The pre test values of group A and B is analyzed by unpaired't' test. The calculated't' value is 0.24, which is lesser than the tabulated 't' value 2.048 at 5% level of significance and 98 degrees of freedom. This test showed that there was no significant difference in reduction of pain between the effect of group A and group B.

Visual Analogue Scale for Pain Unpaired 't' Test - Comparison between Post Test Values of Group-A and Group-B

The comparative mean values, standard deviation and Unpaired 't' test values of Group - A and Group - B.

Group	Mean	Standard Deviation	't' Value
Group A	3.36	0.66	8.57
Group B	2.06	0.84	

Table 4:

The table 4 shows analysis of VAS on unpaired't' test. The pos test values of group A and B is analyzed by unpaired't' test. The calculated't' value is 8.57, which is greater than the tabulated 't' value 2.048 at 5% level of significance and 98 degrees of freedom. This test showed that there was significant difference in reduction of pain between the effect of group A and group B.

Oswerty Low Back Pain Questionnaire for Function Paired 't' Test - Pre Test and Post Test Values of Group-A (Conventional Physiotherapy Protocol)

The comparative mean values, standard deviation and Paired 't' test values of Group A who were treated with ultrasound and strengthening exercises.

Group A	Mean	Standard Deviation	't' Value
Pre test	46.82	6.00	31.81
Post test	24.98	3.31	

Table 5:

The table 5 shows analysis of Oswerty low back pain questionnaire for function on paired't' test. Using paired't' test with 49 degrees of freedom and 5% level of significance, the tabulated 't' value is 2.145 which was lesser than the calculated 't' value 31.81. This test showed that there was significant effect of Oswerty Low Back Pain Questionnaire in improvement of function.

Oswerty Low Back Pain Questionnaire for Function Paired't' Test - Pre Test and Post Test Values of Group-B (Mckenzie Approach of Postural Low Back Pain and Strengthening Exercise)

The comparative mean values, standard deviation and Paired't' test values of Group -B who were treated with ultrasound and strengthening exercises.

Group B	Mean	Standard Deviation	't' Value
Pre test	47.16	6.77	30.13
Pre test	17.68	3.59	

Table 6:

Efficacy of Mckenzie Approach and Conventional Physiotherapy Protocol in Reducing Pain and Disability in Subjects with Postural Low Back Pain

The table 6 shows analysis of Oswerty low back pain questionnaire for function on paired 't' test. Using paired 't' test with 49 degrees of freedom and 5% level of significance, the tabulated 't' value is 2.145 which was lesser than the calculated 't' value 30.13. This test showed that there was significant effect of Mckenzie approach and sstrengthening exercises in improvement of function.

Oswerty Low Back Pain Questionnaire for Function Unpaired 't' Test - Comparison between Pre Test Values of Group-A and Group-B

The comparative mean values, standard deviation and Unpaired 't' test values of Group - A and Group-B.

Group	Mean	Standard Deviation	't' Value
Group A	46.84	6.00	0.26
Group B	47.16	6.77	

Table 7:

The table 7 shows analysis of Oswerty low back pain questionnaire for function on Unpaired 't' test. Pre test values of group A and B is analyzed by unpaired 't' test. The calculated 't' value is 0.26, which is lesser than the tabulated 't' value 2.048 at 5% level of significance and 98 degrees of freedom. This test showed that there was no significant difference in improvement of function between the effect of group A and group B.

Oswerty Low Back Pain Questionnaire for Function Unpaired 't' Test - Comparison between Post Test Values of Group-A and Group-B

The comparative mean values, standard deviation and Unpaired 't' test values of Group - A and Group-B.

Group	Mean	Standard Deviation	't' Value
Group A	24.98	331	10.56
Group B	17.68	3.59	

Table 8:

The table 8 shows analysis of Oswerty low back pain questionnaire for function on Unpaired 't' test. The post test values of group A and B is analyzed by unpaired 't' test. The calculated 't' value is 10.56, which is greater than the tabulated 't' value 2.048 at 5% level of significance and 98 degrees of freedom. This test showed that there was significant difference in improvement of function between the effect of group A and group B.

Discussion

The purpose of this study was to find out the efficacy of McKenzie approach and conventional physiotherapy protocol (Ultrasound and strengthening exercises) in subjects with postural low back pain. 100 subjects were selected who fulfilled the predetermined inclusive and exclusive criteria. The subjects were divided into two groups, 50 in each group. Group A underwent conventional physiotherapy (Ultrasound and strengthening exercises) and Group B underwent McKenzie approach and back strengthening exercises. In before and after treatment value there was a significant reduction in pain and disability in both Groups, which was supported by studies as follows. In both groups post test value shows that there was a significant reduction in pain and disability in Mckenzie approach and back strengthening exercises compare to ultrasound and back strengthening exercises, which was supported by studies as follows.

This study demonstrated a significant increase in functional disability and reduces pain after the application of McKenzie approach and back strengthening exercises in subject with postural low back pain. Evidence stated that both centralized and partially centralized patients of low back pain demonstrated significant improvements in physical performances that remained stable for 10 weeks after the complete McKenzie intervention [5]. These improvements emerged as a result of improved pain and related fear and disability beliefs.

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In a study it has been found that McKenzie therapy results in a decrease in short-term (< 3 months) pain and disability for low back pain patients compared with other standard treatments, such as nonsteroidal anti-inflammatory drugs, educational booklet, back massage with back care advice, strength training with therapist supervision, and spinal mobilization [6]. Efficacy of McKenzie therapy for spinal pain and find out that McKenzie therapy was statistically significantly more effective than other treatments in reducing pain and disability at short term follow-up. They suggest that McKenzie therapy provides on average 8.6 point greater short term pain reduction (pain measured on a 0 to 100 point scale) than other conservative treatments [7]. Benefit of the McKenzie method in treating LBP. Within the McKenzie framework, directional preference (DP) exercises are commonly utilized in clinical practice for managing LBP. Although underpinned by a modest body of evidence, the findings from this systematic review of the literature support current clinical practice perspectives where DP exercises have been shown to have positive effects in the management of LBP. Because the McKenzie method promotes self-management, the use of DP exercises, in conjunction with other common manual therapy treatments, such as mobilization, manipulation, and general exercise, may present a cost-effective and time-efficient approach to managing LBP [8]. McKenzie Exercises and Mat Based Pilates Exercises in Subjects with Chronic Non-Specific Low Back Pain. The results of the study support the basic use of McKenzie and mat based Pilates method was efficacious in the treatment of a group of individuals with nonspecific chronic Low back pain. However, no statistical difference in outcomes was noted between the groups. The results of the current study support the use of McKenzie for the management of chronic non-specific low back pain [9]. The study has however, been limited by several factors. Measuring the lumbar repositioning accuracy for movements in the sagittal plane only, i.e., lumbar flexion and extension, which limited the ability to measure the lumbar repositioning accuracy in side bending and rotation movements. The main limitation is that the considerable amount of sensory input due to large contact area with the body leading to increased cutaneous feedback. The study made significant contribution to the body of knowledge as it provided further evidence that proprioceptive dysfunction do exist in individuals with low back pain. Moreover, the study is the first to compare two groups of low back pain pre and post treatment situation and investigate the difference in proprioceptive deficits between them. The study suggested that patients with low back pain may have altered spinal proprioceptive function and disrupted joint position sense in the lumbar region compared to individuals who improved from low back pain. The study suggested that patients with low back pain may have altered spinal proprioceptive function and disrupted joint position and postural sense in the lumbar region compared to individuals who improved from low back pain. The finding of the current study support the importance of incorporating a screening test for monitoring proprioceptive deficits in individuals with back dysfunction. This study concluded that McKenzie approach and back strengthening exercises showed greater benefit than conventional physiotherapy (ultrasound and back strengthening exercises) to reducing pain and disability.

Conclusion

Hence it can be concluded that McKenzie approach, patient education, postural correction and strengthening exercises is very effective in treating patient with postural low back pain and it results in significant improvement of functional activities and relieving pain.

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