



COMPARISON OF THE EFFECTIVENESS OF MCKENZIE EXTENSION EXERCISE AND CORE STRENGTHENING EXERCISE ON PATIENTS OF PIVD LUMBAR SPINE THROUGH ROM OF FLEXION AND EXTENSION - AN OBSERVATIONAL STUDY IN OUTPATIENT DEPARTMENT OF A PACIFIC MEDICAL COLLEGE

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Article History: Received: 24.03.2023

Revised: 10.05.2023

Accepted: 27.06.2023

Abstract

Background: Degeneration of the lumbar intervertebral disc is a major factor associated with low back pain. The term prolapsed disc means the protrusion or extrusion of the nucleus. It is not a onetime phenomenon rather it is a sequence of change in the disc which ultimately leads to its prolapsed. It is a spinal condition that can cause lower back pain as well as numbness, tightness of muscle, pins and needles sensation, and feeling of muscle weakness in the lower body.

Objective: The study aims to assess the effect of core strengthening exercise and McKenzie exercise in patients with PIVD (lumbar spine) through ROM of flexion and extension.

Methods: This experimental comparative study was carried out after the approval of Pacific Medical University, Institute's ethical approval obtained dated 06/09/2022, PMU/ PMCH/IEC/2022/228. All participants completed information and consent form at recruitment.

30 subjects were chosen based on inclusion and exclusion criteria and randomly assigned to 2 groups of 15 subjects each. Exercises for McKenzie extensions were given to Subjects in Group A, while Core-strengthening exercises were given to Subjects in Group B. Both groups received treatment for six weeks. Both groups received treatment five times per week for a period of six weeks. On the first day of every week until the conclusion of the six weeks, patients were assessed through ROM of flexion and extension.

Results: In terms of pain alleviation, muscle strength, and functional performance, this study found that individuals with prolapsed intervertebral discs (a disorder affecting the lumbar spine) responded better to core strengthening exercises than McKenzie extensions.

Conclusion: The statistical analysis of the current study shown that the core strengthening exercise programme was very effective in treating low back pain brought on by prolapsed intervertebral discs (Lumbar spine disease). As a therapeutic approach, it is successful in lowering pain and functional impairment.

Keywords: Visual Analogue Scale, Prolapsed Inter vertebral Disc, Lumbar spine, range of motion.

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DOI: 10.31838/ecb/2023.12.s3.558

1. Introduction

The vertebral column is the spine's primary bone element, The intervertebral disc is the main joint between two consecutive vertebrae in the vertebral column. Each disc consists of three different structures: an inner gelatinous nucleus pulposus, an outer annulus fibroses that surrounds the nucleus pulposus, and two cartilage endplates that cover the upper and lower surfaces of vertebral body.^{1,2} The intervertebral discs lie between the vertebral bodies, linking them together They are the main surrounds a more gelatinous core known as the nucleus pulposus; the nucleus pulpous is sandwiched inferiorly and superiorly by cartilage endplates.³

The term prolapsed disc means the protrusion or extrusion of the nucleus. It is not a onetime phenomenon rather it is a sequence of change in the disc which ultimately leads to its prolapsed. It is a spinal condition that can cause lower back pain as well as numbness, tightness of muscle, pins and needles sensation, and feeling of muscle weakness in the lower body. This is also referred as a herniated or ruptured disc and is usually caused by normal age-related deterioration.⁴ Degeneration of the lumbar intervertebral disc is a major factor associated with low back pain. In fact, the risk of developing low back pain increases with the severity of degenerative disc changes.⁵

Core stability' is defined as the ability to control the position and motion of the trunk over the pelvis to allow optimum production, transfer and control of force and motion.

Core strengthening has become a major trend in rehabilitation. The term has been used to lumbar stabilization, motor control training, and other regimens. Core strengthening is, in essence, a description of the muscular control required around

the lumbar spine to maintain functional stability.⁶

The most significant biochemical change to occur in disc degeneration is loss of proteoglycan the

osmotic pressure of the disc matrix and therefore a loss of hydration.³

The major player in the stabilizing role for the posterior elements in the lumbar spine is the facet

joint. This is an important point in all type of stability evaluation.

2. Methodology and Procedure

After the approval of Pacific Medical University, Institute's ethical approval obtained dated 06/09/2022, PMU/PMCH/IEC/2022/228. All participants completed information and consent form at recruitment.

The following study includes 30 patients between the age group 20-50 years. This study was conducted at Outpatient Department of Pacific College of Physiotherapy. Subjects were diagnosed by a certified medical practitioner as having pivd (lumbar spine). Then subjects were selected through inclusion criteria. Prior to inclusion, the purpose of the study was explained to all the patients. A written consent was taken from all of them. They were randomly assigned into 2 groups of 15 each.

Group A - McKenzie exercise

Group B - core strengthening

Mckenzie exercise

Mechanical Diagnosis and Therapy (MDT), another name for the McKenzie approach. The McKenzie approach is well recognised as a successful back pain treatment plan. It emphasises self-care through posture correction and frequent, high-intensity repetitions of exercise movements at the end of their range.

All the patients in this group received

precautions. Patients were advised not to actively try to suppress their pain. The exercises were described to the patients. The same five exercises have been chosen for all 15 patients.

1. Prone Lying
2. Prone on Elbows
3. Press-ups while prone
4. Prone on Arm/Leg Raises
5. Standing Extension

Core strengthening

All the patients in this group received warnings and were told not to actively try to suppress their discomfort. Total 6 exercise has been selected which is same for all 15 patients. The patients were explained about the exercises.

The transverse abdominous, multifidus, diaphragm, and pelvic floor muscles are only a few of the muscular groups that make up the "core". Together, these muscles help the lumbar (lower back) and abdominal regions to be as stable as possible.

1. Cat & Camel exercise
2. Bridging exercise
3. The Wall Squat
4. Supine Twist
5. Isometric of back
6. Pelvic tilt

3. Statistical Analysis and Results

Table 1: Statistics demonstrating the efficiency of both the groups of VAS pre- and post-score

Groups	T/T	N	MIN	MAX	SUM	MEAN	Std. Deviation	Std. Error
Group A	Flexion pre	15	5	15	155	10.33	3.994	1.031
	Flexion post	15	20	45	510	34	7.606	1.964
	Extension pre	15	5	10	105	7	2.535	0.655
	Extension post	15	5	15	160	10.67	2.582	0.667
Group B	Flexion pre	15	5	15	160	10.67	3.716	0.959
	Flexion post	15	20	45	560	37.33	6.779	1.75
	Extension pre	15	5	12	114	7.6	2.947	0.761
	Extension post	15	10	15	190	12.67	2.582	0.667

Within and between group differences were compared in order to assess the efficacy of the two treatment techniques taken into consideration in this study. Pain relief was defined as an increase in range of motion of flexion and extension. The McKenzie Extension Exercise was used to treat lower back pain associated with PIVD lumbar spine conditions in group A patients through ROM of flexion and extension as shown in Table Statistics.

Table Statistics Showed the Effectiveness Pre and Post Score of group B patients who are treated with Core strengthening Exercise on Low Back Pain of PIVD Lumbar spine Condition with single variables that is ROM of flexion and extension.

The data from the two groups, McKenzie Extension Exercise and Core Strengthen Exercises, were compared using the student t test.

Regarding all chosen factors, the subject conditions were comparable between the groups. In terms of the ROM the McKenzie extension exercise and the Core strengthening exercise showed a substantial difference.

Therefore, it is discovered that core strengthening exercises are more helpful than McKenzie extension exercises.

Table 2: 't' Test Comparison of both the groups

GROUP	MEAN	Std. Deviation	Std. Error	95% confidence interval of the difference		t	DF	Sig. (2-tailed)
				Lower	Upper			
Group A Flexion pre/post	-23.667	9.537	2.462	-28.948	-18.385	-9.611	14	0.000
Extension pre/post	-3.667	4.419	1.141	-6.114	-1.220	-3.214	14	0.006
Group B Flexion pre/post	-26.667	7.237	1.869	-30.675	-22.659	-14.270	14	0.000
Extension pre/post	-5.067	3.807	0.983	-7.175	-2.958	-5.154	14	0.000

4. Discussion

“There were 30 subjects total in this trial, with groups A and B including both males and females. The protocol ran for 6 weeks. The criteria used to compare the effectiveness of group A's McKenzie extension exercise and group B's core strengthening activity were ROM of flexion and extension⁷.” Results were recorded both during and following therapy. The two factors that all of the individuals had in common were functional impairment and low back discomfort. This treatment has been demonstrated to have a measurable effect for individuals with low back pain⁷. When the mean values of ROM (Table) were analyzed, it was discovered that groups A's flexion ROM pre and post intervention was statically significant at 10.33 and 34, and its extension ROM mean value was 7. and 10.67. According to the statistical analysis group B's findings, the pre- and post-intervention mean values for flexion ROM are 10.67 and 37.33, extension ROM is 7.6 and 12.67. Strengthening the muscles in the core may increase a particular passive stability that would

reduce instability and lessen disc movement. Thus, we can conclude that core strengthening causes pain to decrease. Pain relief offers opportunities to increase movement. More helpful at reducing discomfort and maybe enhancing physical activity is core stability. “When we compared the t test of the Effectiveness of Core Strengthening Exercises and McKenzie Extension Exercise on Low Back Pain of Lumber Prolapsed Disc Condition, we discovered that both groups' results were statistically significant (Tables). The results also showed that both groups' pain levels had improved, which indicates a reduction in functional disability”.

In Group A - mean value and t value of flexion ROM pre and post is (-23.667) and (-9.611) , mean value and t value of extension ROM pre and post is (-3.667) and (-3.214) .

In Group B mean value and t value of flexion ROM pre and post is (-26.667) and (-14.270) , mean value and t value of extension ROM pre and post is (-5.067) and (-5.154) .

The functional impairment was improved by the core group b's significantly (P

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0.0001) larger increase in pain-free movement. Core strengthening is a preventative measure that boosts stability and strength, which lowers the chance of disc displacement. Decreased core strength results in repeated disc displacement. "When compared between the two treatment groups, all outcome measurements demonstrated improvements from the baseline values of the McKenzie extension exercise that were statistically significant at the 0.01 level (2-tailed)." The McKenzie exercise assisted in transferring the disc to the other side of the derangement, hence lowering disc prolapse, and the core stabilisation exercise strengthened the surrounding muscles, demonstrating the efficiency of both procedures in post-treatment outcome measurements. Which is unquestionably the most efficient in lowering pain and enhancing functional disability. Intervertebral disc.⁹ Over other therapies, core strengthening therapy enhances patients' ability to return to work. No other comparison treatment was more successful than Core strengthening. According to clinical research, core strengthening is a good way to treat back pain in the short term (3 months to 24). The results of this pilot study showed that the Core strengthening protocol of treatment for low back pain was considerably more effective in reducing pain, extending the amount of time that can be spent comfortably sitting, and expanding the range of motion that is pain-free⁸. The approach's impact on pain and functional disability shown a post-treatment, significantly decreased level of pain.

5. Conclusion and Clinical Implication:

The study can be applied to patients suffering from prolapsed intervertebral

disc condition. In group B patients, there has been a good improvement on the ROM. "The results of the current study shown that a core strengthening exercise programme was very beneficial in treating low back pain caused by a prolapsed lumbar intervertebral disc condition." It is effective in reducing pain and functional impairment as a therapy strategy. In this case, my results significantly show that core strengthening exercise is more effective than McKenzie extension exercise in treating pain and improving functional disability. Core strengthening exercise helps strengthen the surrounding muscles.

Scope & Limitation

The research to be carried out by taking large sample size. Further studies can be done by using different outcome measures. Studies with longer duration are recommended with longer follow-up period to assess the benefits. Further studies can also be done by using different variable.

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