Effects of Mckenzie exercises in reducing pain and improving functional range of motion in individuals with low back pain associated with lumbar disc prolapse- A Review of Literature.

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ABSTRACT

The goal of this study is to see if McKenzie exercises can assist persons with lumbar disc prolapse feel better and have more functional range of motion. Lumbar disc prolapse is one of the most common causes of low back pain. When the nucleus pulposus of the intervertebral disc protrudes at the lumbar level, the spinal cord or nerve roots are directly compressed. The posterior Longitudinal ligament buckles and osteophytes occur commonly as a result of disc bulging. The majority of persons with symptomatic lumbar disc prolapse have morning stiffness and low back discomfort. Depending on the extent of disc protrusion, the herniation can cause a range of issues. During lumbar flexion, the nucleas pulposus receives the majority of the compressive force.

CONCLUSION

The study concluded that mckenzie exercise is effective in reducing pain and improving functional range of motion in individuals with low back pain associated with lumbar disc prolapse.

Keywords:- *lumbar disc prolapse, mckenzie exercises, low back pain.*

INTRODUCTION

Low back pain (LBP) affects more than 80% of the population in developed countries at some point in their lives. Low back discomfort is prevalent worldwide, with estimates ranging from 49 to 80 percent. According to thirty-one studies, the prevalence of back pain in India ranges from 62 percent in the general population to 78 percent in those who have Lumbar disc herniation. The most prevalent cause of lumbosacral radiculopathy is LDH, which is defined as the localized displacement or disturbance of disc material beyond the borders of the intervertebral disc space[1].

PIVD is a collective term that describes a process in which annular fiber rupture allows the nucleus pulposus to be displaced inside the intervertebral space, most typically in a posterior or postero-lateral orientation. The stages of nucleus degeneration, nuclear displacement (stages of protrusion, extrusion, and sequestration), and fibrosis are the sequences of changes that occur in PIVD[2]. It is a degenerative disease in which disc components (nucleus pulposus or annulus fibrosis) are displaced beyond the intervertebral disc space. LIDH is one of the most common causes of sciatica and lower back pain. Radiological examination can confirm the diagnosis[3]. Chemical stimulation of the nociceptive nerve fibers by inflammatory agents following injuries to these anular fibers may induce pain. Extradiscal structures that are nociceptively innervated, such as the posterior longitudinal ligament, the dural sleeves of the nerve roots, and possibly the dural covering of the spinal cord, can be compressed by disc herniation. Radiculitis can also be caused by a herniated disc. Radicular pain can also be caused by a herniated disc. Mechanical compression has been proven to affect the dorsal root ganglia[4]. As a result of the degenerative process in the spinal column, age is a primary risk factor. Symptoms usually appear in midlife, with males being affected in their 40s and women in their 50s and 60s[5]. Many people experience significant pain and incapacity during the acute phase of LBP, which can last up to 6 weeks. Acute LBP has a positive prognosis[6]. Because of its physically restrictive character, chronic LBP (CLBP) frequently leads to lifestyle modifications and extended absences from work. CLBP must be treated as soon as possible because to the discomfort and inconvenience it causes[7]. Radicular leg discomfort in the lumbar spine is frequently caused by lumbar intervertebral disc disease[8]. The elimination of distal and spinal discomfort in response to repetitive motions or persistent postures is known as centralization (McKenzie and May, 2003). The recurrent movement that creates centralization, an abolition or

decrease in symptoms, or an increase in restricted range of motion is termed as directional preference (McKenzie and May, 2003). The terms "centralization" and "directional preference" are used interchangeably. Centralization and directional preference are essential clinical phenomena because they occur as a result of therapeutic loading methods and are thus therapeutically produced, as well as because they characterize a long-term change[9]. The McKenzie method focuses on maintaining long-term postures or movements. McKenzie Method of Mechanical Diagnosis and Therapy (MDT) is a well-researched classification system. When categorizing patients with LBP, this evaluation and therapy approach has shown strong interexaminer reliability. MDT was created to categorize patients into one of three mechanical subgroups (disorder, dysfunction, or postural condition) or a "other" grouping, based on which treatment should be directed[10]. Although McKenzie exercises can help with acute low back pain, they can also help with subacute low back pain and CLBP[11]. This is a frequent therapy strategy utilized by physiotherapists when dealing with back discomfort. The 'centralization phenomenon,' which has been widely employed, is used to quantify improvement in symptoms. By examination, it combines recurrent end range actions; the classification of exercise direction is based on the patient's response to those recurring actions. The McKenzie exercise relies heavily on posture adjustment and the maintenance of that correction[12]. The McKenzie Method's purpose is to have the patient participate actively in their therapy by practicing the prescribed exercises five or six times a day, as opposed to once or twice a week in a clinic. The McKenzie Method teaches patients how to self-treat low back pain problems in the long run, allowing them to reduce their chance of recurrence and self-treat their symptoms if they do. The McKenzie Method is well-known as a dependable and effective diagnostic and treatment technique for low back pain, as well as a tool for doctors to use in early prognosis[13]. This program combines the clinician's repetitive manipulative therapy with the patient's home-based activities. In patients with lumbar disc prolapse, the McKenzie program is cost effective and improves pain and impairment in the short and long term[14]. The McKenzie technique is a less active form of spinal manipulation in which the patient is responsible for the motion, position, and pressures that help to improve the problem. The McKenzie back extension is a transition from lying prone to lying prone on one hand with excessive pressure. These back extensions exercises from prone lying are thought to have a better effect in shifting disc content anteriorly away from spinal nerves, reducing radicular sensations in patients with derangement, and conducting repeated extension exercises will assist maintain and improve spinal extension[15]. The purpose of this study is to see how McKenzie exercises affect low back pain caused by lumbar disc prolapse.

METHODOLOGY

The following literature search was done using various electronic databases such as google scholar , PubMed, Web of Science and researchgate , etc to carry out systematic analysis of the literature study. The study was searched using the keywords like mckenzie exercises, low back pain and lumbar disc prolapse.
The studies consisted of following inclusion and exclusion criteria:
Inclusion criteria:
1.Individuals with low back pain were included in the study.
2. People who have symptomatic disc prolapse.
3. The study includes people who have limited functional mobility.
4. Both males and females are included in the study.
5. Articles with full text.
Criteria for exclusion:
1. People who have an asymptomatic condition.
2. Articles written in languages other than English were excluded.

Sr no.	Author and year	Study Title	Methodology	Result and Conclusion

1.	Bo Zhang, Haidong Xu, Juntao Wang, Bin Liu, Guodong Sun-2017	A narrative review of non-operative treatment, especially traditional Chinese medicine therapy, for lumbar intervertebral disc herniation	Since the 1980s, we have conducted a search on non-operative treatment for LIDH, particularly TCM therapy, mostly using PubMed, Web of Science, China National Knowledge Internet (CNKI), and Chinese biomedicine databases, with no language restrictions. We wrote a narrative evaluation based on these relevant references, emphasising current understanding about the effectiveness. for LIDH treatment, as well as the efficacy and safety of various conservative treatments, with a special focus on TCM therapy, such as acupuncture, autonomy, Chinese massage, and Chinese herbal medications.	Because each of these therapies has its own set of benefits and drawbacks, we can't say that one way of non-operative treatment is clearly superior to another, and there isn't enough evidence to define ideal nonsurgical manageme nt.
2.	MAY, Stephen, RUNGE, Nils and AINA, Alessandro-2018	Centralization and directional preference: an updated systematic review with synthesis of previous evidence	Any full-text study in individuals with low back or neck pain, with or without radiating symptoms, that documented some feature of centralization or directional preference was included. From June 2011, the date of the latest search, to December 2017, Medline, Cinahl, and AMed were searched.The website www.mckenziemd t.org, which has a	After screening 2486 titles and abstracts, 101 full texts were assessed for eligibility, and 43 articles were eventually included (see Figure 1). RCTs or controlled trials (10), or their secondary

			section on centralization and offers references relevant to the McKenzie technique, was also utilised. All of the included articles' reference lists were also combed through.The following search terms were used separately and in combination: centralization, OR directional preference; OR phenomena; AND spine pain, OR back pain, OR neck pain, OR cervical, OR lumbar.	analyses (4), cohort studies (15), or case studies (10), and four cross-sectional studies were among the 43 new papers since the last evaluation (May and Aina 2012). This review analyzed 43 additional papers in addition to synthesising literature from 62 earlier investigations.
3.	LuFei Harder-2021	The effects of the McKenzie Method and strengthening/ stabilization exercises in patients with chronic nonspecifific low back pain.	High-quality resources and research on the effectiveness of exercise therapy in patients with CNLBP were found using PubMed, EBSCOhost/MEDLINE, and Google Scholar.The McKenzie Method and alternative exercise regimens for patients with low back pain are covered in these databases, which are significant to the study since they comprise health and social care and medical articles.	In conclusion, the researcher has established that both therapy modalities, McKenzie Method and strengthening exercises, are beneficial in treating persons with persistent nonspecific low back pain, based on the data in this review.
4.	Maurits van Tulder, PhD,* Antti Malmivaara, MD, PhD† Rosmin Esmail,	Exercise Therapy for Low Back Pain	We searched the Cochrane Controlled Trials	There were 39 trials found in

	MSc,‡ and Bart Koes, PhD§-2000	A Systematic Review Within the Framework of the Cochrane Collaboration Back Review Group	Register, Medline, Embase, PsycLIT, and article reference lists. All methods of exercise therapy for people with nonspecific low back pain with or without radiation into the legs were included in randomised studies. Two reviewers extracted data and rated trial quality independently.	this study. Exercise therapy is not more effective for acute low back pain than inactive or other active treatments with which it has been evaluated, according to substantial data. The data included in this systematic review does not support the use of particular exercises for the treatment of acute low back pain. Patients may benefit from exercises. Exercises may be helpful for patients with chronic low back pain to increase return to normal daily activities and work.
5.	Maciej Czajka 1 A-E Aleksandra Truszczyńska-Baszak 1 A,D,E,F Małgorzata Kowalczyk-2018	The effectiveness of McKenzie Method in diagnosis and treatment of low back pain – a literature review	The study looked at 50 studies from the last 20 years that dealt with the diagnosis and treatment of low back pain using the McKenzie Method. Following the	The McKenzie Method was found to be highly helpful in diagnosing pain, depending

			application of inclusion criteria, the final analysis included 22 papers.Google Scholar, PubMed, the Library of the Centre for Postgraduate Medical Education, and the Main Medical Library were all used.	on the level of qualifications of the therapists who used it. The McKenzie Method was found to be an effective treatment for low back pain, producing greater results than traditional rehabilitation and comparable results to other therapeutic techniques. Conclusions: A thorough understanding of this procedure is essential for achieving high diagnostic efficiency. The McKenzie Method in combination with other forms of therapy produced the best outcomes in terms of improving spine mobility and overall quality of life, as well as lowering impairment levels.

6.	John Mayer, DC, PhDa,b,c,*, Vert Mooney, MDa,d, Simon Dagenais, DC, PhD-2008	Evidence-informed management of chronic low back pain with lumbar extensor strengthening exercises	6) Leading spine practitioners and researchers were requested to contribute articles to this supplement, where they were asked to synthesise the best available evidence for a certain intervention and encouraged to make this knowledge accessible to nonexperts.Each article has five sections (description, theory, evidence of efficacy, harms, and summary) with common subheadings to allow for comparison across the 24 interventions described in this special emphasis issue, combining narrative and systematic review methodology as the authors see suitable.	The current data demonstrates that lumbar extensor strengthening exercise, provided alone or in combination with co-interventions, is more successful in decreasing pain, disability, and other patient-reported outcomes in CLBP in the short term than no treatment and most passive modalities. When lumbar extensor strengthening activities are compared to other exercise programs, there is no evident effect.
7.	Mohammad Anwar Hossain1,2, Iqbal Kabir Jahid2, Md. Forhad Hossain3, Zakir Uddin4,*, Md. Feroz Kabir5, K. M. Amran Hossain1, Md. Nazmul Hassan6 and Lori Walton7-2021	Efficacy of McKenzie Manipulative Therapy on Pain, Functional Activity and Disability for Lumbar Disc Herniation	This was a 36-month RCT at the Center for Rehabilitation of the Paralyzed (CRP) in Savaar, Bangladesh, in which the assessors were blinded. Seventy-two subjects were randomly selected from hospital records, ranging in age from 28 to 47	Both groups experienced significant pain and disability reductions, with the McKenzie technique exceeding the control group (p.05). In

			years old and clinically diagnosed with LDH MRI findings. Sixty-eight were found to be eligible.Stretching exercises and graded oscillatory mobilisation were given to the control group, whereas McKenzie manipulative treatment was given to the experimental group for 12 sessions over four weeks. Both groups got a conventional set of care.	comparison to baseline, both groups reported considerably lower post-report unpleasant in activities (SBI) (p.01). McKenzie outperformed the control group (p.05) in terms of overall fear avoidance and SBI feeling of strange sensation in leg. In single and multiple level LDH patients, the McKenzie manipulative therapy technique was found to be useful for pain, disability, and activity participation in a short period of time, from day one to week four, and the treatment effect lasts for another six months.
8.	Trupti Warude1, S. Shanmugam2-2012	The Effect of Mckenzie Approach and Mulligan's Mobilisation (SNAGS) in Lumbar Disc Prolapse with Unilateral Radiculopathy	30 individuals aged 25 to 45 were assigned into groups A and B based on the Qubec Task Force (QTF) classification. Shortwave diathermy, intermittent lumbar	Except for rotation ROM, both groups exhibited improvement in VAS, MOLBPDI, and ROM. Group B,

			traction, and interferential therapy were used as baseline treatments for both groups, as well as the McKenzie technique for Group A and Mulligan's (SNAGS) for Group B.Measures of success The VAS, the Modified Oswestry Disability Index (MOLBPDI), and lumbar range of motion (ROM) were all measured before and after treatment.	on the other hand, made more progress. McKenzie method and Mulligan's mobilisation (SNAGS) are both beneficial in relieving pain, functional capacity, and range of motion in prolapsed intervertebral discs with unilateral radiculopathy, but the latter is more so.
9.	MohaMMadhosseinifar, PhD Candidate1), MohaMMad akbari, PhD1)*, haMid behtash, MD2), Mohsen aMiri, PhD3), Javadsarrafzadeh, PhD1)-2013	The Effects of Stabilization and Mckenzie Exercises on Transverse Abdominis and Multifidus Muscle Thickness, Pain, and Disability: A RandomizedControlled Trial in NonSpecific Chronic Low Back Pain	The discomfort, impairment, and thickness of the transverse abdominis and multifidus muscles were measured using a visual analogue scale, a functional rating index, and sonography before and after the intervention. For both groups, the training programme consisted of 18 scheduled sessions of individual training	In both groups, the pain score decreased after interventions. Only the stability group's disability score dropped. During resting and contracting states, the thickness of the left multifidus was dramatically increased in the stabilization group. Stabilization exercises are more helpful than McKenzie exercises at reducing

				pain intensity and increasing function score.
10.	OLIVIER T. LAM, PT1 • DAVID M. STRENGER, PT2 • MATTHEW CHAN-FEE, PT3 PAUL THUONG PHAM, PT4 • RICHARD A. PREUSS, PT, PhD5 • SHAWN M. ROBBINS,-2018	Effectiveness of the McKenzie Method of Mechanical Diagnosis and Therapy for Treating Low Back Pain: Literature Review With Meta-analysis	The data extraction form was influenced by the Cochrane meta-analysis guidelines, and the methodology for this review was based on the PRISMA statement. There were randomised controlled trials that looked at the efficacy of MDT for pain and disability in people with LBP.The following search terms were used to search six electronic databases: MEDLINE, Embase, CINAHL, Cochrane Database of Systematic Reviews, PsycINFO, and the Physiotherapy Evidence Database [PEDro]: (1) MDT therapy, (2) low back/lumbar pain, and (3) randomised controlled trials	A literature search yielded 758 publications, with 678 coming from databases and 80 from reference lists (FIGURE 1). 2 independent reviewers reviewed 354 abstracts and chose 51 publications for full-text review after deleting duplicates. Following the review, 17 publications were chosen for the meta-analysis; however, four of these 17 studies did not have enough data to be included in the statistical analyses. MDT is not superior to alternative rehabilitation therapies for lowering

				pain and impairment in people with acute LBP, according to moderate to high-quality data.
11.	1Mohamed Nabil El-Bahrawy, 2Nagwa Ibrahim Rehab and 3Samar Adel Ibrahim Farahat-2019	EFFECT OF LUMBAR STABILIZATION VERSUS MCKENZIE EXERCISES ON PAIN AND FUNCTIONAL DISABILITY IN PATIENTS WITH POST LAMINECTOMY SYNDROME: A RANDOMIZED CONTROLLED TRIAL	Traditional physical treatment (ultrasound, TENS, and moist heat) was given to group (A), lumbar (core) stabilisation exercises were given to group (B), and McKenzie exercise was given to group (C). For four weeks, the training regimen consisted of three sessions per week. The Visual Analogue Scale (VAS) was used to quantify pain intensity, and the Oswestry Disability Questionnaire was used to assess disability.	In three groups, there was a statistically significant reduction in the mean values of pain score and Oswestry disability Questionnaire after therapy (p0.05). Following treatment, the core stabilization exercise group had a significantly higher reduction in pain and functional disability than the McKenzie group and the conventional therapy group (p0.05). McKenzie is less helpful than core stabilization exercise in lowering pain and impairment in patients with PLS.

12.	Anas Mohammed Alhakami 1, 2) , Sally Davis3) , Mohammed Qasheesh4) , Abu Shaphe4)*, Aksh Chaha-2019	Effects of McKenzie and stabilization exercises in reducing pain intensity and functional disability in individuals with nonspecific chronic low back pain: a systematic review	From its start to the present, Web of Science, PubMed/MEDLINE, Cochrane Library online, National Rehabilitation Information Centre (NARIC), ProQuest Medical Library, and PEDro have all been used. The author's search phrases and Boolean operators include "chronic" AND "nonspecific" AND "low back pain" OR "lumbar spine" AND "stabilisation" OR/AND "McKenzie" AND "exercise" OR "method" OR "training" OR "therapy" AND "transverses abdominus" AND "multifidus" OR "method" OR "training" OR "therapy" AND "transverses abdominus" AND "multifidus" OR "method" OR "training	- After removing duplicates from the title search, a total of 829 articles were found. This qualitative review covered a total of ten papers. All ten studies are randomized controlled trials, and they all focus on persons with chronic nonspecific low back pain. All of them were comparison trials in which McKenzie exercise was compared to other types of workouts. Compare and contrast McKenzie exercise with stability. Five research, for example, compared McKenzie exercise to other types of exercises such Back School exercise, mat-based Pilates,

				rigorous strengthening training, manual treatment, and electrophysical approaches, while two studies compared McKenzie exercise to stabilization exercises. Furthermore, three research compared stability exercise to other forms of workouts. For example, active lumbar strengthening exercises, stretching, and general exercise 27, 35, and 36).
13.	Marc Karlsson1,2, Anna Bergenheim2,3,4, Maria E. H. Larsson2,4, Lena Nordeman2,4, Maurits van Tulder5,6 and Susanne Bernhardsson2-2020	Effects of exercise therapy in patients with acute low back pain: a systematic review of systematic reviews	Systematic reviews of randomised controlled trials were found in PubMed, the Cochrane library, CINAHL, PEDro, Open Grey, Web of Science, and PROSPERO. Two authors independently assessed the methodological quality of the study using AMSTAR. If possible, meta-analyses were carried out using data from the original research. The researchers looked at data on pain, disability,	The findings of this systematic review of systematic reviews suggest that there is very low-to-moderate certainty evidence that exercise therapy of any kind, compared to other interventions, causes little or no significant

			recurrence, and side effects. Grades were used to determine the certainty of the evidence.	difference in pain or disability in adult patients with acute LBP at any of the follow-up points reported.
14.	Fayez Ibrahim Namnaqani1, Abdulrhman Salah Mashabi2, Khalid Mohammed Yaseen3, Mansour Abdullah Alshehr	The effectiveness of McKenzie method compared to manual therapy for treating chronic low back pain: a systematic review	The following techniques were used: pain, mobilisation, traction, end-range exercises, mechanical diagnosis and therapy (MDT), manipulation, and active range of motion (AROM) exercises. When conducting the search, regional variations in spelling (e.g., between US and British English) were taken into account, as were acronyms and abbreviated phrases. There were no language filters applied.Further prospective sources of information were identified by manually searching and reviewing the references of the relevant publications retrieved. All of the patients had an orthopaedic checkup and a postural assessment. To confirm the diagnosis of Chronic LBA, the Slump test, Faber's test, Bilateral straight leg raising	There were a total of 203 publications found in the electronic databases, with an additional 7 items discovered through a manual bibliographic search. The McKenzie approach was found to be successful in reducing pain in CLBP patients in the short term, according to this review, which looked at a number of different pain measurements.

			test, and Prone lumbar instability test are used. VAS is used to determine the severity of a condition.	
15.	V Vijayaraj-2018	A comparative study between McKenzie technique and neural mobilization in chronic low back pain patients with radiculopathy	All of the patients had an orthopaedic checkup and a postural assessment. To confirm the diagnosis of Chronic LBA, the Slump test, Faber's test, Bilateral straight leg raising test, and Prone lumbar instability test are used. VAS is used to determine the degree of pain in people who have chronic low back pain.The MODQ is used to determine the severity of disability in people suffering from chronic low back pain.	Thirty patients were included in the trial, 15 in group A and 15 in group B. In 30 patients, the diagnostic test for Chronic Low Back Ache with Radiculopathy was positive. The VAS and MODQ Questionnaires were administered four weeks apart before and after therapy. McKenzie technique was used on 15 patients, while neural mobilization was used on 15 others. The paired t test values show that the McKenzie Technique was more effective than neural mobilization for patients with chronic low

				back pain. The pre and posttest values were assessed by VAS and MODQ in the table above, and the paired t test values show that the McKenzie Technique was more effective than neural mobilizatio n for patients with chronic low back pain.
16.	Safdar Hussain Arain1 , Muhammad Kashif Abbasi2 , Sajjad Hussain Bhatti3 , Agha Syed Ali Haider Naqvi4-2021	A Comparative Study of McKenzie Back Program and Conventional Physiotherapy in Relieving Backache due to Lumbar Disc Prolapse.	The Orthopedic Department of Pir Abdul Qadir Jeelani Institute of Medical Sciences, Gambat Khairpur Sindh, undertook this randomised controlled experiment. The study's duration was extended from March 2nd, 2019 to February 2nd, 2021All patients with back pain owing to lumbar disc prolapse who met the inclusion criteria were randomly assigned to one of two groups: group A (McKenzie back programme) or group B (non-McKenzie back programme) (Conventional physiotherapy).	There were 120 patients in total who were studied. A statistically significant improveme nt in FTF was observed in group A at the 2nd and 4th week (P 0.05) post-interventio n in both groups A and B. At the 8th week after the interventio n, VAS, FTF, and ODI in group A were substantiall y higher (P 0.05) than in group B. Conclusion : In patients with

				backache owing to lumbar disc prolapse, the McKenzie back program is more successful than traditional physiotherapy and stretching exercises in lowering pain, enhancing lumbar spine mobility, and decreasing disability.

Table 1

CONCLUSION

McKenzie exercises for low back pain caused by lumbar disc prolapse, according to the study, are effective in lowering pain and improving lumbar functional range of motion.

CONFLICTS OF INTEREST

Authors have declared no competing interests exists.

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This study has not received any external funding.

DISCUSSION

The goal of the review study was to see how McKenzie exercises helped those with low back pain caused by lumbar disc prolapse. The research involved searching the databases PubMed, Google Scholar, Web of Science, and Researchgate . In a study Tarang Srivastava et al. In 2013 concluded that in both groups, the VAS value decreased, although the experimental group improved more significantly than the control group. McKenzie technique for lowering dysfunction pain is an effective, scientific, and cost-efficient therapy[16].
According to a 2018 study by Dibyendunarayan Dhrubaprasad Bidet al., McKenzie exercises are beneficial in lowering pain, pain sensitization, disability, and fear avoidance beliefs in CNSLBP patients with or without CS. McKenzie exercises are useful in lowering pain, pain sensitivity, disability, and fear avoidance beliefs in people with CNSLBP, but they do not enhance trunk flexor and extensor endurance[17]. McKenzie exercises and Wii-Fit Yoga were found to be equally efficient in the treatment of persistent non-specific low back pain in a 2018 study by Sandeep Pal and Ruchika Sharda [18]. In a study, Alessandra Narciso Garcia et al. in 2013 concluded that In patients with persistent low back pain, the McKenzie technique (a more resource-intensive intervention) was marginally more beneficial than the Back School method for disability, but not for pain intensity immediately after treatment[19]. A. Jeganathan et al. concluded in a study published in 2018 that patients with painful flexion should be given Mckenzie extension exercises. Williams flexion and McKenzie extension exercises are considerably effective in relieving mechanical low back pain, according to statistical analysis, interpretation, and evidence in the current study[20]. Manikandan A et al. concluded in a study published in 2021 that the current study

provides evidence that the McKenzie technique is more helpful in lowering pain and enhancing functional abilities in people with Mechanical Low Back Syndrome[21]. Helen A Clare et al. concluded in a 2004 study that McKenzie therapy does result in a higher reduction in pain and disability for low back pain patients in the short term than other standard therapies[22].

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