

## Evidence-based Case Report

# McKenzie Exercise for Reducing Low Back Pain Complaints in Office Worker: An Evidence-based Case Report

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### ABSTRACT

**Background** Low back pain is not a malignancy and is a self-limiting condition, but patients always seek treatment to reduce the severity of their symptoms. Chronic Low Back Pain can alter lifestyle and increase the rate of prolonged absenteeism at work resulting in physical limitations. Discomfort due to chronic low back pain is a sign that requires immediate treatment.

**Methods** The purpose of this evidence-based case report is to get the right answer about McKenzie's exercise in reducing low back pain in office workers. Article searches were conducted through PubMed, Embase, and Cochrane Library. Inclusion criteria were Systematic Review, Meta-Analysis, Randomized Control Trial (RCT), Adult or Productive Age, Non-Specific Chronic Low Back Pain, and McKenzie Exercise. Then, it was critically reviewed using Oxford CEBM criteria for intervention-therapy studies.

**Results** 1 research article that met the inclusion criteria with the type of Randomized Control Trial (RCT) was obtained.

**Conclusion** The critical review showed that the McKenzie exercise could reduce complaints of low back pain at 5 weeks of treatment, but this exercise did not show a clinical effect in the form of a reduction in complaints of low back pain after being implemented for 3, 6, and 12 months.

## INTRODUCTION

Low back pain (LBP) is pain that is felt in the lower back area, namely between the corners of the lowest ribs and the lower buttocks (lumbar or lumbosacral area), and can be local pain or radiate to the upper thighs/legs or both.<sup>1</sup>

Low back pain is often found in the industrial world and has a high prevalence which has both personal and socioeconomic consequences. In 1997, Finland reported that 33% of women and 29% of men experienced complaints of low back pain and 11% of women and 10% of men reported having been diagnosed and treated by a doctor.<sup>2</sup>

Globally, low back pain occupies 10% of debilitating conditions that result in changes in life expectancy due to disability.<sup>3</sup> Lower back pain is not malignant and is a condition that can heal on its own, however, patients always seek therapy to reduce the severity of the symptoms they experience. Chronic Lower Back Pain (Chronic Low Back Pain) can change lifestyle and increase the number of prolonged absences from work resulting in physical limitations. Discomfort due to chronic lower back pain is a sign that it requires immediate treatment.<sup>4</sup>

The etiology of low back pain is not completely understood but can be assumed to be multifactorial, indicating there are individual factors, physical factors, and psychosocial factors that

may contribute to the development and severity of symptoms.<sup>5</sup> Previous research has identified several individual factors associated with Low Back Pain including gender<sup>6</sup>, level of education<sup>7</sup>, smoking<sup>8</sup>, sleep disorders<sup>9</sup>, and long driving.<sup>10</sup>

Clinical factors that can increase the risk of Low Back Pain such as scoliosis<sup>11</sup>, weak back muscle strength<sup>12</sup>, poor lumbar stability<sup>13</sup>, and abnormal body mobility.<sup>14,15</sup>

Work-related factors as the risk factor for Low Back Pain include accumulated computer use which can increase Lower Back Pain.<sup>16</sup> Sitting for more than half of the working hours together with an awkward position or a standing position bent forward routinely increases the frequency of lower back pain.<sup>17,18</sup> The ergonomic position of workstations' poor performance contributes significantly to the development of low back pain.<sup>18</sup> Psychosocial problems such as high stress<sup>19</sup>, low job satisfaction<sup>18</sup>, low social support<sup>20</sup>, and appreciation for effort<sup>21</sup> also contribute to cases of lower back pain. Low physical activity (sedentary work) is one of the occupational factors that influences the occurrence of lower back pain both directly and indirectly. Sedentary work According to Raymond, this means that in everyday life, employees almost always do their work in a sitting position (rarely/only occasionally walking).<sup>22</sup>

Based on the results of research by Waikar & Bradshaw (1995) on 203 workers with sedentary work, at the managerial, staff, and technical personnel levels, the results showed that the majority experienced musculoskeletal complaints.<sup>23</sup>

Low physical activity is often associated with a static sitting position, where a static position while working can increase the risk of lower back pain.<sup>7</sup> According to research conducted by Emami et al., the main risk factors for lower back pain are bending over and sitting in a sedentary position for more than 4 hours per day.<sup>24</sup>

Apart from being associated with static working positions and low physical activity, LBP is also associated with obesity nutritional status, because in people who are obese, there is compression of the nerves in the spine which causes lower back pain.<sup>5</sup>

The results of Suharto's (2008) research in Makassar on 20 employees of the Tax Service Office showed that there was a decrease in the number of employees who complained of back pain after being given back exercises, from previously 17 people to 4 people after doing back exercises.<sup>25</sup>

Research conducted on 60 industrial workers in the textile and garment sector had an impact on back exercise which was carried out for 10 days, reduced the level of lower back pain with a significant difference in the pain levels of the intervention and control groups.<sup>9</sup>

Even though there is data that interventions can be carried out to reduce complaints of low back pain, it is still necessary to review the evidence to get the right answer and to increase understanding of the effect of the McKenzie Exercise in reducing low back pain.

## CASE DESCRIPTION

A 43-year-old male came with a chief complaint were feeling pain in his back for the last 1 year. The patient does not have any urinary disorder and does not have a traumatic history for the last 1 year. The patient does not have a history of this disease before.

The patient works in the accounting division at a government office. His main job is to maintain and control cash flow and also to validate the payment with other organizations or institutions who cooperate with the government. He works 8 hours/day including lunch time for five days a week. He has been working in the accounting division for approximately 5 years without any change in the workstation and the pain increasing for the last 1 year caused by workload increased. Work in the accounting division requires sitting in front of the computer for more than 2 hours. There are 3 of the patient's co-workers have the same feeling of pain in the back but they don't take any medication and do some exercises instead. The patient has the lower back pain for the last 1 year and has taken some medications such as analgesics from the health facility. The patient has been watching the back exercise on the online video streaming. The patient asked the doctor to get information on whether the McKenzie Exercise will reduce the low back pain or not.

## PROBLEM FORMULATION

Can McKenzie Exercise Reduce Low Back Pain? To answer this question, we used PICO guidelines to get some keywords. For the 'Problem' section, we have 'Worker' OR 'Sitting Worker' OR 'Low Back Pain'. For the 'Intervention' section, we have 'McKenzie Method' OR 'MTD'. For the 'Outcome' section, we have 'Low Back Pain'

## EVIDENCE SEARCH STRATEGY

The literature search was performed to answer the clinical question via electronic databases from PubMed, Embase, and Cochrane Library. The keywords used were Low Back Pain and McKenzie.

The inclusion criteria of this search consist of Systematic Review articles, Meta-Analysis articles, Randomized Controlled Trial (RCT) articles, subjects or samples of chronic non-specific low back pain, studies conducted on productive age, and studies not comparing with another exercise. The exclusion criteria were case report articles, cross-sectional study articles, guidelines, protocol, a study conducted on pediatrics and young adults, subject or sample on acute low back pain and other back pain, compared with other exercise studies and statistical value is not available.

## CRITICAL APPRAISAL

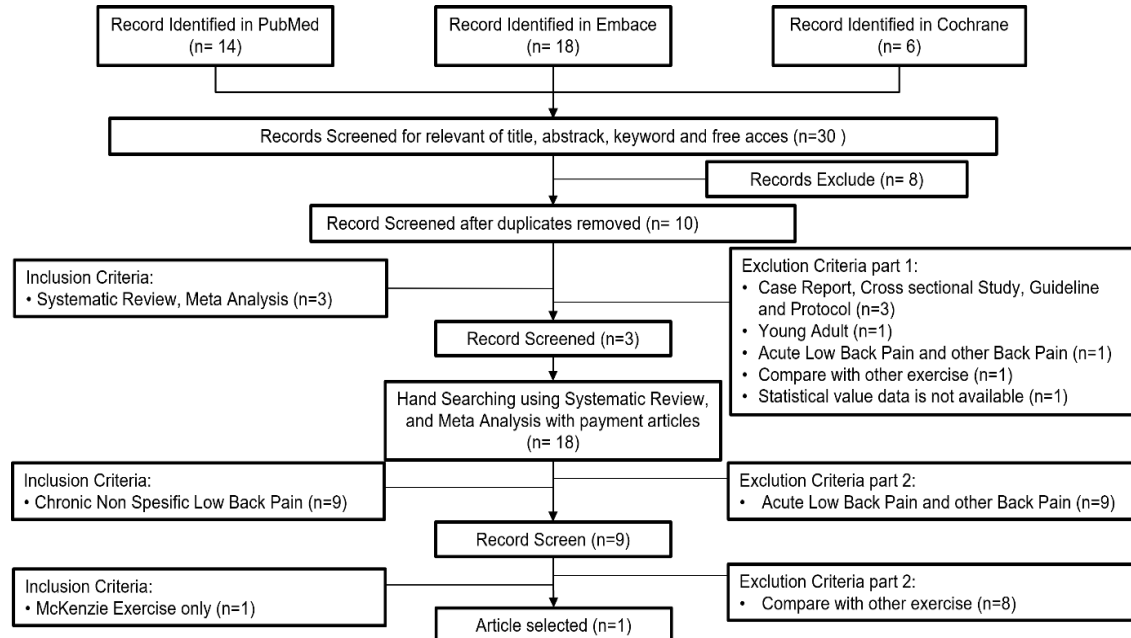
The selected articles were then critically appraised to determine whether the article is valid, important, and applicable to the patient using relevant criteria by the Oxford Centre for Evidence-Based Medicine for interventional study or systematic review.<sup>26</sup>

## RESULT

The literature search was done on April 13<sup>th</sup>, 2022, using a search strategy as seen in Table.

**Table 1. Searching strategy using Electronic Databases from PubMed, Embase, and Cochrane Library**

Database	Searching Strategy	Finding
PubMed	((low back pain[MeSH Terms]) AND (McKenzie Method)) AND (MDT)	14
Embase	McKenzie AND exercise AND low AND back AND pain	18
Cochrane Library	#Low Back Pain AND #McKenzieMethod AND #MDT	6



**Figure 1. Research Article Selection**

The search was carried out using 3 search engines such as PubMed, Embase, and Cochrane Library. The author screened based on the relevance of title, abstract, keyword, and free access. The author also screened articles with duplication, resulting in 10 articles being screened based on inclusion and exclusion criteria. There are 3 final articles in the form of systematic reviews or meta-analyses that can be used, but the author conducted a manual search based on these articles. So 18 articles were obtained which would be screened again based on the type of low back pain which

consisted of acute LBP and chronic LBP. The author carried out another screening on the type of exercise used for intervention McKenzie Exercise. The author got 1 article that described reducing complaints of lower back pain through McKenzie exercises.

**Table 3. Study Characteristics**

Author	Study Design	Subjects	Problem	Intervention	Outcome and Result	Proper Inclusion Criteria	Level of Evidence
Garcia AN, et.al <sup>27</sup>	RCT	148 patients with chronic non-specific low back pain	Low back pain	McKenzie Exercise	The McKenzie Method was slightly more effective than placebo for pain intensity.  Result Adjusted mean differences (95% CI) 5 weeks = -1.0 (-2.10;-0.01), p=0.04 3 months = -0.94 (-1.99;0.09), p=0.07 6 months = -0.75 (-1.80;0.28), p=0.15 12 months = -0.07 (-0.96;1.12), p=0.88	Yes	2

Level of evidence (intervention)<sup>26</sup>

- 1: Systematic review of randomized trials, a systematic review of nested case-control studies, n-of-1 trial with the patient that you are raising the question about, or observational study with dramatic effect.
- 2: Individual randomized trial or (exceptionally) observational study with dramatic effect.
- 3: Non-randomized controlled/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out common harm (For long-term harms, the duration of follow-up must be sufficient).
- 4: Case series, case-control, or historical studies.
- 5: Mechanism-based reasoning.

## DISCUSSION

The study carried out by Garcia et al<sup>27</sup> is a Randomized Control Trial aiming to compare McKenzie's exercise with a placebo (no exercise) in patients who complain of low back pain. The research was carried out on 148 patients with a diagnosis of Chronic Non-specific Low Back Pain who sought treatment at the physiotherapy clinic at Cidade de Sao Paolo University between May 2014 and July 2015. This study used The McKenzie Method of Mechanical Diagnoses and Therapy (MDT) as a prescription combined with an educational approach so that it has a positive impact on patients with Chronic Low Back Pain in a short period. In this study, we not only looked at pain complaints in patients but also looked at the level of disability recovery in patients.

This study used the Numerical Pain Rating Scale (NPRS) as an instrument for assessing pain intensity. To get more eligible results, patients must have a pain intensity of at least 3 points (from 0-10 using NPRS), aged between 18 and 80 years. Patients who have contraindications for exercise. Undergoing ultrasound and short-wave therapy, proven nerve root damage through clinical neurology examination, serious spinal pathology, serious metabolic and cardiovascular diseases, history of spinal surgery, and pregnancy were excluded from the study.

The use of the McKenzie Method of Mechanical Diagnose and Therapy (MDT) This study was carried out for 1 year with monitoring at the 5th week, 3rd month, 6th month, and 12th month after randomization. Participants were also compared with the placebo group who only received ultrasound for 5 minutes and short-wave heating for 25 minutes, however, the equipment used was not connected to an electrical source to get a placebo effect from the patients.

This study resulted in a reduction in complaints of lower back pain using the Numeric Pain Rate Scale (NPRS) during the 5-week training period. This can be seen in the study results section in the training group McKenzie there was a scale reduction of up to 4 points compared to the placebo group

with a scale reduction of up to 2 points. However, it did not show a decrease in the pain scale after being implemented for 3 months, 6 months, or even 12 months. In this study, it was stated that there was a clinical value/effect if there was a decrease in the pain scale by 1 point.

The limitation of this paper is the number of articles that meet the inclusion criteria set by the author only 1 (one) article. This article was obtained through hand searching method from a Literature Review article with Meta-Analysis conducted by Lam and Strenger.<sup>28</sup>

The clinical implications of this exercise can be used for low back pain complaints, both acute and chronic. If this exercise is applied during the acute period of complaints, it will give good results for 5 weeks of training. When applied to chronic low back pain according to Schenk et al<sup>29</sup> and Kilpikoski et al<sup>30</sup> it can reduce pain levels significantly and provide a significant improvement in the Roland Disability Score. Even up to 6 months of follow-up, McKenzie was still able to give significant results on the disability index in studies previously reported.<sup>31</sup>

A comparison of McKenzie exercises with other exercises can be seen in a study carried out by Cherkin et al.<sup>32</sup> This study compared physical therapy exercises, chiropractic manipulation, and the use of educational booklets. The results were the patients who received McKenzie physical therapy and chiropractic manipulation had the same effects and costs compared to patients who only received educational booklets with minimal intervention.

A systematic review of 5 (five) articles comparing manual therapy (orthopedic manual therapy, spinal manipulation, posture correction, chiropractic manipulation) with McKenzie exercises was carried out by Fayez IN, Abdulrahman SM et al.<sup>33</sup> It concluded that the five studies reported a significant reduction in pain levels for the first 6 months compared to patients who only received manual therapy. Providing 12 months of training did not find any significant differences between the McKenzie training groups but still had the effect of reducing the level of disability compared to Manual Therapy.

The author hopes that studies related to the McKenzie exercise can be conducted in Indonesia using a large sample of Indonesian office workers so that the characteristics of the results can describe the success of this exercise.

## CONCLUSION

There is 1 (one) research article with design RCT (Randomized Control Trial) which uses the McKenzie Exercise to reduce complaints of lower back pain. The evidence found the practice of McKenzie can reduce complaints of lower back pain after 5 weeks of treatment, cannot be used long-term, and does not have clinical effects after being implemented for 3 months, 6 months, or even 12 months.

## DECLARATION

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**Conflict of Interests:** The authors have no conflict of interest to disclose.

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