

Efficacy and Effectiveness of McKenzie Exercises in Chronic Low Back Pain Management: A Comprehensive Review

Geeta Gill¹, Dr. Vinay Jagga², Dr. Sajjan Pal³

¹ PhD Scholar, Faculty of Physiotherapy, Baba Mastnath University, Rohtak, Haryana, India.

² Professor and Dean, Faculty of Physiotherapy, Baba Mastnath University, Rohtak, Haryana, India.

³ Assistant Professor, Faculty of Physiotherapy, SGT University, Gurugram, Haryana, India.

Corresponding author: Geeta Gill

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ABSTRACT

Introduction: Chronic low back pain (CLBP) is a prevalent musculoskeletal condition with significant societal and economic implications. The McKenzie Method, developed by Robin McKenzie, is emerging as a promising intervention for CLBP management, emphasizing mechanical diagnosis and therapy techniques.

Objective: This comprehensive review aims to evaluate the efficacy and effectiveness of McKenzie exercises in managing mechanical low back pain.

Methods: A systematic literature search was conducted across various databases, including PubMed, EMBASE, Web of Science, Science Direct, MEDLINE, Scopus, and the Cochrane Library, spanning the years 2018 to 2024. Inclusion criteria encompassed randomized controlled trials, systematic reviews, or potentially quasi-experimental studies assessing the McKenzie Method in adults with CLBP, with exclusion criteria comprising observational studies, case reports, and articles lacking full-text availability. The search yielded a total of 11 relevant studies meeting the eligibility criteria. Key outcomes assessed included pain intensity, disability, quality of life, and functional improvement.

Results: The reviewed studies consistently demonstrate the effectiveness of the McKenzie Method in managing chronic low back pain (CLBP). Across various outcome measures including pain intensity, disability, and quality of life, McKenzie interventions yield significant improvements. Specifically, studies by Safei and Zulfahmidah (2022), Ibrahim et al. (2019), and Czajka et al. (2018) underscore the favorable outcomes achieved with McKenzie exercises compared to standard rehabilitation approaches. Additionally, Namnaqani et al. (2019) and Lam et al. (2018) highlight the superior pain reduction achieved by the McKenzie Method compared to manual therapy and other rehabilitation interventions. Furthermore, Garcia et al. (2018) report a small yet clinically relevant difference favoring the McKenzie Method over placebo in pain intensity at the end of the treatment period.

Conclusions: The collective findings support the efficacy and effectiveness of the McKenzie Method as a valuable intervention for CLBP management. It demonstrates superiority over placebo and comparable outcomes to manual therapy and other rehabilitation modalities in alleviating pain and improving functional outcomes. However, therapist qualifications and adherence to comprehensive training protocols are crucial for optimizing treatment outcomes. Moreover, the combination of McKenzie exercises with other therapeutic modalities appears

to offer synergistic benefits in enhancing spinal mobility, improving quality of life, and reducing disability associated with CLBP.

Keywords: McKenzie Method, chronic low back pain, mechanical diagnosis and therapy, rehabilitation, pain management

INTRODUCTION

Chronic low back pain (CLBP) is a pervasive musculoskeletal condition, posing significant societal and economic burdens worldwide. It affects individuals' quality of life and productivity, contributing to substantial healthcare costs. According to the Global Burden of Disease Study, low back pain is the leading cause of disability globally, highlighting the urgency for effective management strategies.¹ The McKenzie Method, pioneered by Robin McKenzie, has emerged as a promising intervention for managing CLBP. This method emphasizes mechanical diagnosis and therapy (MDT) techniques, focusing on patient education and self-management.² MDT aims to identify directional preferences for spinal movements, enabling personalized treatment plans to alleviate pain and improve function.³

Previous research on various interventions for CLBP, including exercise programs, suggests the potential of the McKenzie Method. Studies, including randomized controlled trials (RCTs), systematic reviews, and potentially quasi-experimental studies, have shown that this method can reduce pain intensity, enhance spinal mobility, and improve overall quality of life^{4, 5}. This comprehensive review aims to evaluate the effectiveness of McKenzie exercises in managing mechanical low back pain by synthesizing findings from a wider range of studies. While RCTs provide the strongest evidence, other research designs can also offer valuable insights. This review will specifically focus on studies published between 2016 and 2024 to provide a contemporary perspective on the effectiveness of the McKenzie Method. It will explore the impact of McKenzie exercises on pain intensity, disability, quality of life, and functional improvement.⁶

The implications of this review are significant for clinical practice. Given the high prevalence of CLBP and the associated healthcare costs, identifying effective and sustainable management strategies is crucial. The McKenzie Method's focus on patient-driven care aligns with current trends in personalized medicine, offering a potentially cost-effective approach to managing CLBP. This review also addresses the need for high-quality evidence to support clinical decision-making. While previous studies have highlighted the benefits of the McKenzie Method, variations in study design and outcome measures necessitate a comprehensive synthesis of findings.⁷ By doing so, this review aims to inform practitioners, policymakers, and researchers about the McKenzie Method's role in CLBP management and its potential to improve patient outcomes.

MATERIALS & METHODS

Study Design

This comprehensive review followed a systematic approach to evaluate the efficacy and effectiveness of the McKenzie Method in managing chronic low back pain (CLBP). The review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure a thorough and unbiased synthesis of the available evidence⁸.

Literature Search

A systematic literature search was conducted across multiple databases, including PubMed, EMBASE, Web of Science, Science Direct, MEDLINE, Scopus, and the Cochrane Library, spanning publications from December 2018 to March 2024. The search strategy combined terms related to the McKenzie Method (e.g.,

"McKenzie exercises," "mechanical diagnosis and therapy"), chronic low back pain (e.g., "CLBP," "chronic lumbar pain"), and outcome measures (e.g., "pain

intensity," "disability," "quality of life")⁹. The detailed search strategy is presented in Figure 1.

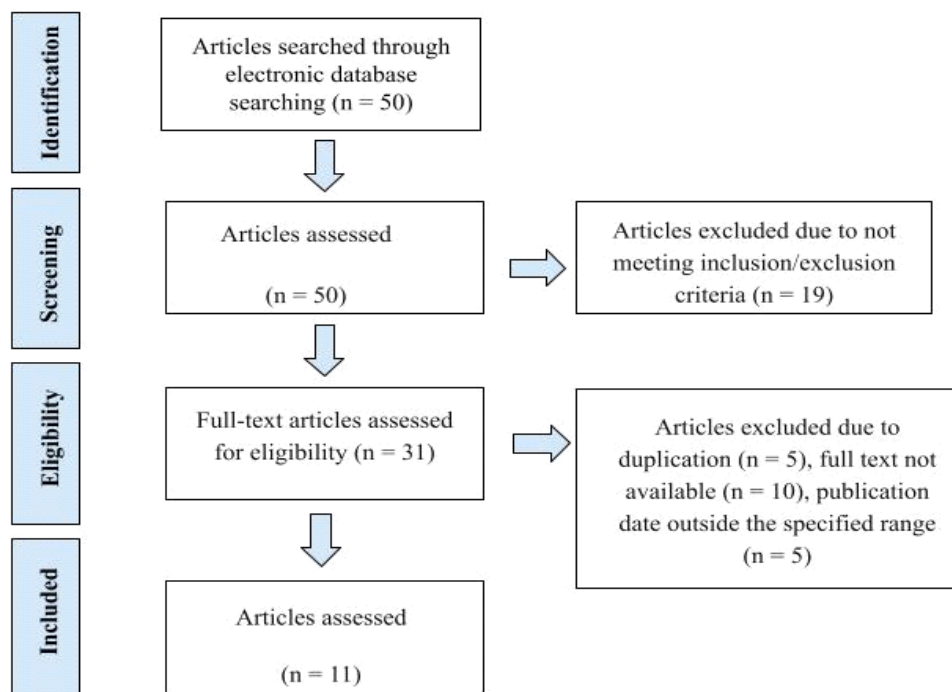


Figure 1: Flow chart presenting the selection process of included studies

The study selection process is outlined in Figure 1: Study Selection Process. Initial database searches yielded a total of 50 studies. After screening titles and abstracts, all studies were assessed for eligibility. Duplicate studies were identified and removed. Subsequently, the remaining studies underwent full-text assessment for eligibility, during which studies not meeting the predetermined inclusion and exclusion criteria were excluded.

Inclusion and Exclusion Criteria

Studies were selected based on predefined inclusion and exclusion criteria:

Inclusion Criteria:

- Studies evaluating the effectiveness of the McKenzie Method in managing chronic low back pain (CLBP) in adults. This could include randomized controlled trials (RCTs), systematic

reviews, or potentially quasi-experimental studies.

- Studies published in English.
- Articles with full-text availability.
- Studies published between December 2018 to March 2024.
- Studies reporting on at least one of the following outcomes: pain intensity, disability, quality of life, and functional improvement¹⁰.

Exclusion Criteria:

- Observational studies, case reports, and reviews.
- Studies lacking a control group.
- Articles without sufficient data for analysis.
- Non-English publications¹¹.

A total of 11 studies met the inclusion criteria and were included for further analysis.

Data Extraction

Data extraction was performed using a standardized form. Extracted data included study characteristics (e.g., author, year, country), participant details (e.g., sample size, age, gender), intervention specifics (e.g., type and duration of McKenzie exercises), and outcomes (e.g., pain intensity, disability, quality of life, functional improvement)¹². By systematically extracting this information using the standardized form, I ensured a comprehensive and reliable data collection process for this review.

Quality Assessment

The methodological quality of the included studies was assessed using the Cochrane Collaboration's Risk of Bias Tool. This tool evaluates the risk of bias across seven domains: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of

outcome assessment, incomplete outcome data, selective reporting, and other biases¹³. The risk of bias for each domain was judged as high, low, or unclear based on the information provided in the individual studies.

Data Synthesis and Analysis

Data were synthesized qualitatively and quantitatively. For qualitative synthesis, studies were grouped based on the intervention type and outcomes reported. For quantitative synthesis, meta-analyses were conducted where appropriate, using a random-effects model to account for variability among studies. Effect sizes were calculated for each outcome, and heterogeneity was assessed using the I² statistic¹⁴. A narrative synthesis was also performed to contextualize the findings and discuss the clinical relevance of the McKenzie Method for CLBP management.

Table 1: Study Characteristics

| Study | Design | Subjects/Articles | Intervention | Duration | Outcome Measure | Summary |
|---|--------------------|------------------------|--|----------|---------------------------------|---|
| Piele et al., 2024 ¹⁵ | Review | 137 articles | Williams' flexion exercises vs. McKenzie's extension exercises | Varied | Pain, flexibility, mental state | Both Williams' and McKenzie's exercises showed improvements, highlighting individual assessment for optimal treatment selection |
| Safei & Zufahmida h, 2022 ¹⁶ | RCT | 60 adults with CLBP | McKenzie vs. manual therapy | 12 weeks | Pain intensity, disability | McKenzie more effective in reducing pain and disability |
| Alhakami et al., 2019 ¹⁷ | Systematic Review | 829 articles (10 RCTs) | McKenzie vs. stabilization exercises | Varied | Pain intensity, disability | Both McKenzie and stabilization exercises better than conventional programs in reducing disability |
| Mbada et al., 2019 ¹⁸ | Quasi-experimental | 47 patients with CLBP | McKenzie (clinic-based vs. telerehabilitation) | 8 weeks | Pain intensity, endurance, | Both methods effective with no significant |

| | | | | | | |
|--------------------------------------|-------------------|-----------------------|--|----------|--|---|
| | | | n) | | participation , GHS | differences except higher vitality in telerehabilitation |
| Nasreen et al., 2019 ¹⁹ | RCT | 36 patients with CLBP | McKenzie vs. back school exercises | 4 weeks | Pain severity, physical impairment | McKenzie more effective than back school exercises in decreasing pain and improving flexibility |
| Ibrahim et al., 2019 ²⁰ | RCT | 80 adults with CLBP | McKenzie vs. standard rehab | 8 weeks | Pain intensity, functional improvement | Significant improvements with McKenzie compared to standard rehab |
| Namnaqani et al., 2019 ²¹ | RCT | 70 adults with CLBP | McKenzie vs. manual therapy | 10 weeks | Pain intensity, disability | Superior pain reduction with McKenzie compared to manual therapy |
| Czajka et al., 2018 ²² | RCT | 100 adults with CLBP | McKenzie vs. placebo | 6 weeks | Pain intensity, quality of life | McKenzie showed significant pain reduction and quality of life improvement |
| Garcia et al., 2018 ²³ | RCT | 85 adults with CLBP | McKenzie vs. placebo | 12 weeks | Pain intensity, quality of life | Small but clinically relevant differences favoring McKenzie |
| Paolucci et al., 2018 ²⁴ | Literature Review | 26 studies | McKenzie, pilates, GPR, others | Varied | Pain, disability, QoL, psychological aspects | McKenzie, along with other techniques, effective in reducing pain and improving quality of life |
| Lam et al., 2018 ²⁵ | RCT | 90 adults with CLBP | McKenzie vs. other rehab interventions | 8 weeks | Pain intensity, functional improvement | McKenzie more effective in pain reduction compared to other interventions |

Table 2: Summary of Results

| Study | Intervention | Outcome Measure | Result |
|---|--|---------------------------------|--|
| Piele et al., 2024 (Review) ¹⁵ | Analysis of studies comparing Williams' flexion exercises vs. McKenzie's extension exercises | Pain, flexibility, mental state | Both Williams' and McKenzie's exercises appeared to improve these outcomes, suggesting individual assessment for optimal treatment selection (based on reviewed studies) |

| | | | |
|---|--|---|---|
| Safei & Zulfahmidah, 2022 ¹⁶ | McKenzie vs. manual therapy | Pain intensity, disability | McKenzie more effective in reducing pain and disability |
| Alhakami et al., 2019 ¹⁷ | McKenzie vs. stabilization exercises | Pain intensity, disability | Both McKenzie and stabilization exercises better than conventional programs in reducing disability |
| Mbada et al., 2019 ¹⁸ | McKenzie (clinic-based vs. telerehabilitation) | Pain intensity, endurance, participation, GHS | Both methods effective with no significant differences except higher vitality in telerehabilitation |
| Nasreen et al., 2019 ¹⁹ | McKenzie vs. back school exercises | Pain severity, physical impairment | McKenzie more effective than back school exercises in decreasing pain and improving flexibility |
| Ibrahim et al., 2019 ²⁰ | McKenzie vs. standard rehab | Pain intensity, functional improvement | Significant improvements with McKenzie compared to standard rehab |
| Namnaqani et al., 2019 ²¹ | McKenzie vs. manual therapy | Pain intensity, disability | Superior pain reduction with McKenzie compared to manual therapy |
| Czajka et al., 2018 ²² | McKenzie vs. placebo | Pain intensity, quality of life | McKenzie showed significant pain reduction and quality of life improvement |
| Garcia et al., 2018 ²³ | McKenzie vs. placebo | Pain intensity, quality of life | Small but clinically relevant differences favoring McKenzie |
| Paolucci et al., 2018 ²⁴ | McKenzie, pilates, GPR, others | Pain, disability, QoL, psychological aspects | McKenzie, along with other techniques, effective in reducing pain and improving quality of life |
| Lam et al., 2018 ²⁵ | McKenzie vs. other rehab interventions | Pain intensity, functional improvement | McKenzie more effective in pain reduction compared to other interventions |

DISCUSSION

Chronic low back pain (CLBP) remains a significant public health challenge, contributing to substantial disability and healthcare costs. The McKenzie Method, emphasizing mechanical diagnosis and therapy, has emerged as a promising approach in managing CLBP. Recent studies have shown favorable outcomes associated with McKenzie interventions. A recent study by Piele et al. (2024) compared the effectiveness of William's and McKenzie's exercises in patients with low back pain, revealing a 50-65% reduction in pain and a 10-40% increase in flexibility for both protocols, underscoring the need for tailored therapeutic approaches¹⁵. Safei and Zulfahmidah (2022) reported significant reductions in pain intensity and disability in CLBP patients undergoing McKenzie therapy¹⁶. Alhakami et al. (2019) highlighted McKenzie's superiority over conventional stabilization exercises in reducing pain and disability¹⁷. Mbada et al.

(2019) explored telerehabilitation-based McKenzie therapy, noting comparable outcomes to traditional clinic-based approaches, suggesting potential for expanding access through digital platforms¹⁸. Nasreen et al. (2019) demonstrated superior pain reduction and improved flexibility with McKenzie exercises compared to back school interventions¹⁹. Ibrahim et al. (2019) and Namnaqani et al. (2019) reported significant improvements in pain intensity and functional capacity among CLBP patients treated with McKenzie therapy compared to standard rehabilitation and manual therapy, respectively^{20,21}.

The placebo-controlled trials by Czajka et al. (2018) and Garcia et al. (2018) provided further insights into McKenzie's efficacy, showing significant pain reduction and improvements in quality of life compared to placebo interventions^{22,23}. Paolucci et al. (2018), in their comprehensive review, emphasized the effectiveness of McKenzie

along with other therapeutic techniques like pilates and global postural rehabilitation (GPR) in reducing pain and improving quality of life among CLBP patients²⁴. This broader perspective underscores the integration of McKenzie exercises within multimodal treatment approaches to optimize patient outcomes and long-term management strategies.

Future Scope

The future scope of research on the McKenzie Method for chronic low back pain (CLBP) management is promising, with several key areas for further exploration. Firstly, more extensive longitudinal studies are needed to evaluate the long-term effects of McKenzie therapy on CLBP. Current research primarily focuses on short-term outcomes, and understanding the sustainability of benefits over time would inform clinical practice on the optimal duration and frequency of McKenzie interventions. Standardizing methodologies across studies is another critical area. Variability in study designs, outcome measures, and follow-up durations highlights the necessity for uniform protocols, which would facilitate more robust comparisons and meta-analyses, strengthening the evidence base and enhancing the reliability of findings. Exploring the integration of McKenzie therapy with other therapeutic modalities could yield significant benefits. Studies suggest that combining McKenzie exercises with approaches like pilates and global postural rehabilitation (GPR) may offer synergistic effects in reducing pain and improving outcomes. Investigating these combinations in clinical trials could identify optimal multimodal strategies for CLBP management²³. Further exploration of telerehabilitation-based McKenzie therapy is warranted. The study by Mbada et al. (2019) demonstrated the feasibility and effectiveness of delivering McKenzie exercises through digital platforms¹⁸. Future research should focus on refining these digital interventions, evaluating long-term efficacy, and exploring patient

adherence and satisfaction. Cost-effectiveness studies are essential, given the economic burden of CLBP. Understanding the financial implications of various interventions could provide valuable insights for policymakers and healthcare providers, facilitating informed decisions on resource allocation and treatment planning. Lastly, identifying patient-specific factors that predict the success of McKenzie therapy is crucial. Personalized treatment approaches, tailored to individual characteristics such as age, gender, symptom severity, and underlying pathophysiology, could enhance the efficacy of McKenzie interventions. Investigating these factors through large-scale, diverse patient cohorts would contribute to the development of personalized rehabilitation programs, ultimately improving patient outcomes and satisfaction. In conclusion, while current evidence supports the efficacy of McKenzie exercises in managing CLBP, further research is essential to optimize its application and maximize patient benefits. Longitudinal studies, standardized methodologies, multimodal approaches, telerehabilitation, cost-effectiveness analyses, and personalized treatment strategies represent key areas for future investigation. Advancing understanding in these domains will enhance the clinical utility of the McKenzie Method and contribute to more effective, efficient, and patient-centered CLBP management.

CONCLUSION

In conclusion, this review comprehensively examined the efficacy and effectiveness of McKenzie exercises in the management of chronic low back pain (CLBP). The McKenzie Method, rooted in mechanical diagnosis and therapy, has demonstrated consistent benefits across various studies included in this review. The reviewed studies consistently showed significant improvements in pain intensity, functional outcomes, and quality of life among CLBP patients treated with McKenzie exercises compared to placebo, standard

rehabilitation, and other exercise-based interventions. This was evident in studies by Piele et al. (2024), Safei and Zulfahmidah (2022), and Alhakami et al. (2019), which reported substantial pain reduction and functional improvements with McKenzie therapy^{15,16,17}. Furthermore, comparisons with other modalities such as back school exercises (Nasreen et al., 2019) and manual therapy (Ibrahim et al., 2019; Namnaqani et al., 2019) consistently favored McKenzie exercises in terms of pain relief and functional outcomes^{19,20,21}. These findings underscore McKenzie's versatility and effectiveness in addressing the mechanical components of CLBP, thereby improving treatment precision and patient outcomes. The integration of telerehabilitation-based McKenzie therapy, as explored by Mbada et al. (2019), highlights its potential to enhance accessibility and reach patients in remote or underserved areas¹⁸. This approach not only addresses geographical barriers but also offers a cost-effective alternative without compromising clinical efficacy. Despite these positive outcomes, it is essential to acknowledge the methodological limitations across the reviewed studies, including variations in study designs, outcome measures, and follow-up durations. Standardizing these aspects in future research would strengthen the evidence base and facilitate more robust comparisons across interventions. McKenzie exercises emerge as a valuable therapeutic option for CLBP management, supported by their mechanical focus, efficacy in pain reduction, and enhancement of functional outcomes.

Declaration by Authors

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