



JOURNAL OF THE ROYAL LAUREATES ACADEMY

www.rlaindia.org

COMPARATIVE EFFECTIVENESS OF EXERCISE-BASED REHABILITATION AND CONVENTIONAL CARE IN PATIENTS WITH POSTURAL LOW BACK PAIN

Bipin Albert George

Research Scholar, Sunrise University, Alwar, Rajasthan

Dr Pankaj Kumar

Associate Professor, Sunrise University, Alwar, Rajasthan

ABSTRACT

Postural low back pain is a common musculoskeletal problem associated with prolonged sitting, inappropriate body mechanics, reduced physical activity, muscular imbalance, and sustained abnormal spinal loading. Conventional treatment may provide symptomatic relief, but exercise-based rehabilitation aims to address contributing physical impairments and improve functional capacity. This paper examines the comparative effectiveness of exercise-based rehabilitation and conventional care in individuals with postural low back pain. Exercise-based rehabilitation may incorporate flexibility exercises, trunk and hip strengthening, core stabilization, postural correction, movement retraining, and progressive functional activities. Conventional care may include routine physiotherapy, advice, symptomatic management, and commonly used physical modalities. Current evidence supports exercise as an important component of non-surgical low back pain management, although outcomes can vary according to exercise type, duration, adherence, and patient characteristics. WHO recommends structured exercise among non-surgical interventions for chronic primary low back pain. A comprehensive rehabilitation approach may therefore provide improvements in pain, mobility, physical function, and activity participation.

Keywords: Postural Low Back Pain, Exercise Rehabilitation, Conventional Treatment, Strengthening Exercises, Flexibility, Core Stability, Physiotherapy, Functional Recovery

I. INTRODUCTION

Low back pain is one of the most common musculoskeletal conditions affecting individuals across different age groups and occupational categories. It can interfere with mobility, work, recreational activities, sleep, and participation in everyday life. The World Health Organization identifies low back pain as the leading cause of disability worldwide and estimates that approximately 619 million people experienced low back pain in 2020. Although low back pain may arise from specific pathological conditions, a large proportion of cases are classified as non-specific, meaning that a single structural cause cannot be confidently identified. Postural factors, prolonged static positions, inappropriate movement patterns, reduced muscular endurance, and physical inactivity may contribute to symptoms in susceptible individuals.

Postural low back pain is particularly relevant in individuals who spend prolonged periods sitting, standing, bending, or performing repetitive occupational activities. Sustained postures can influence spinal loading and may be accompanied by reduced flexibility, muscular weakness, altered pelvic positioning, and impaired trunk control. When these factors persist, patients may develop limitations in movement and functional activities. Rehabilitation therefore aims not only to reduce symptoms but also to improve physical capacity and promote appropriate movement strategies. WHO emphasizes that rehabilitation for low back pain should help individuals return to meaningful activities and improve functioning.

Conventional treatment for low back pain may involve patient education, activity modification, physical therapy, manual approaches, therapeutic modalities, and pharmacological management when clinically appropriate. Exercise-based rehabilitation provides an additional approach that directly targets physical impairments. Structured exercise may include strengthening, flexibility, aerobic conditioning, motor-control training, and other forms of physical training. WHO's evidence review describes structured exercise as planned and purposeful activity intended to improve physical capacity, including muscle and joint strength, function, range of motion, and aerobic capacity. The effectiveness of exercise may depend on appropriate selection and progression rather than simply prescribing activity.

Comparing exercise-based rehabilitation with conventional care is therefore clinically relevant. A rehabilitation programme can potentially address the underlying functional contributors to postural low back pain while conventional care may place greater emphasis on

symptom management and general physiotherapy. The WHO guideline recommends exercise programmes among non-surgical management approaches for chronic primary low back pain and supports person-centred care that considers physical, psychological, and social factors. This paper examines the comparative role of exercise-based rehabilitation, focusing on pain, flexibility, muscular performance, functional ability, postural control, and quality of life.

II. EXERCISE-BASED REHABILITATION FOR POSTURAL LOW BACK PAIN

Exercise-based rehabilitation represents a structured approach to improving physical capacity and reducing functional limitations associated with low back pain. The programme may include stretching, strengthening, core stabilization, mobility exercises, postural education, and progressive functional activities. The underlying principle is that patients should gradually develop the physical capacity required to perform daily activities without excessive mechanical stress. Rather than relying exclusively on passive treatment, rehabilitation encourages active participation and self-management.

Flexibility exercises may target muscles and structures that contribute to restricted movement. Commonly addressed areas include the hamstrings, hip flexors, gluteal musculature, lumbar region, and other relevant muscle groups. Reduced flexibility may influence pelvic movement and spinal mechanics during sitting, standing, bending, and walking. Carefully prescribed stretching can improve range of motion and may make movement more comfortable. Stretching should be individualized because excessive or inappropriate stretching may aggravate symptoms in some patients.

Strengthening exercises provide another major component of rehabilitation. Weakness or reduced endurance of the abdominal, lumbar, pelvic, and hip musculature can affect the individual's ability to maintain stable and efficient movement. Progressive strengthening can include abdominal activation, bridge exercises, trunk extension or stabilization exercises, hip strengthening, and functional resistance exercises. The intensity should be increased gradually according to patient tolerance, baseline capacity, and clinical response.

Core stabilization and motor-control exercises may be particularly relevant when postural control is impaired. These exercises emphasize coordinated activation of the trunk and pelvic musculature during controlled movements. The objective is not simply to increase muscle strength but to improve the individual's ability to control the trunk during functional

activities. Such training can be combined with education regarding sitting posture, lifting technique, standing mechanics, and workplace movement strategies.

Exercise rehabilitation can also promote self-efficacy. Patients who learn how to perform exercises independently may become more confident in managing recurrent symptoms. Regular physical activity can reduce excessive fear of movement and encourage gradual return to normal activities. WHO emphasizes physical activity, self-care, and rehabilitation as important elements in managing low back pain. Patient adherence is therefore an important determinant of programme effectiveness.

However, exercise should not be considered a single uniform intervention. Programmes differ substantially in exercise selection, frequency, duration, supervision, intensity, and progression. WHO's evidence synthesis indicates that structured exercise can provide benefits for pain and function, although certainty varies across outcomes and time points. Consequently, exercise programmes for postural low back pain should be individualized and progressively adjusted rather than applied identically to every patient.

III. CONVENTIONAL CARE AND COMPARATIVE FUNCTIONAL OUTCOMES

Conventional care for low back pain may include physiotherapy assessment, patient education, advice regarding activity, manual therapy, therapeutic modalities, and symptom-management strategies. Depending on the clinical setting, treatment may also include appropriate medication prescribed by qualified healthcare professionals. The objective is generally to reduce symptoms and facilitate return to normal activities. For patients with uncomplicated non-specific low back pain, a combination of interventions may be used according to clinical assessment.

Conventional physiotherapy can provide useful short-term support, particularly when pain limits participation in active rehabilitation. Techniques such as heat, manual therapy, mobility exercises, and education may help patients begin movement with greater comfort. However, passive approaches may have limitations if they are not accompanied by active rehabilitation. Long-term functional improvement generally requires patients to regain physical capacity and develop strategies for independent management.

Exercise-based rehabilitation differs in its emphasis on active adaptation. The patient performs repeated movements intended to increase strength, flexibility, endurance, coordination, or movement control. This may be particularly relevant in postural low back pain, where occupational and lifestyle behaviours can repeatedly expose individuals to contributing factors. Active rehabilitation can therefore provide an opportunity to modify movement behaviour while simultaneously improving physical capacity.

Functional outcomes are important when comparing treatment approaches. Pain intensity is clinically relevant, but successful rehabilitation should also consider walking ability, sitting tolerance, bending, lifting, work participation, and activities of daily living. WHO notes that low back pain can restrict work, social participation, and everyday activities and that rehabilitation aims to restore meaningful participation. Measures such as the Oswestry Disability Index, Roland-Morris Disability Questionnaire, pain scales, range-of-motion measurements, and functional performance tests can be used to evaluate outcomes.

The comparative effect of treatment may also be influenced by adherence. A patient who regularly performs a prescribed exercise programme may experience a different outcome from a patient who receives the same programme but rarely performs the exercises. Similarly, conventional treatment outcomes may depend on the frequency and duration of treatment. Therefore, clinical studies should record treatment adherence and exposure when evaluating comparative effectiveness.

Overall, conventional care and exercise rehabilitation need not be viewed as mutually exclusive approaches. Exercise may form an active component of a broader rehabilitation programme that also includes education and appropriate symptom-management strategies. WHO recommends a person-centred approach and notes that a combination of interventions may be necessary rather than relying on a single intervention in isolation. The comparative question is therefore particularly relevant when determining whether adding structured exercise to conventional care provides additional functional benefits.

IV. CLINICAL IMPLICATIONS AND REHABILITATION OUTCOMES

Exercise-based rehabilitation can have several potential implications for patients with postural low back pain. Improvements in trunk and hip strength may increase tolerance for prolonged activities, while improved flexibility may facilitate more efficient movement. Better muscular endurance may allow patients to maintain functional positions for longer

periods. These changes can contribute to improvements in occupational and daily activities even when complete elimination of pain is not achieved.

Postural correction is another important component. Patients should be educated to recognize prolonged or poorly supported postures and to modify them where practical. However, postural education should not create excessive fear about particular positions. Contemporary approaches to low back pain generally emphasize maintaining appropriate activity and avoiding unnecessary restriction. WHO recommends education and self-management strategies alongside physical interventions for chronic primary low back pain.

Functional recovery should also be evaluated from a broader perspective. A reduction in pain without improvement in participation may not represent complete rehabilitation. Conversely, patients may continue to experience some pain while demonstrating substantial improvements in mobility, confidence, work capacity, and daily function. Outcome assessment should therefore incorporate multiple dimensions, including pain, disability, range of motion, muscular performance, physical activity, and quality of life.

Progressive rehabilitation may also help reduce dependency on passive treatment. Once patients acquire sufficient knowledge and physical capacity, they can continue many exercises independently. This can improve continuity of care and provide a practical strategy for long-term management. However, the exercise programme should be reviewed when symptoms change, and patients should receive appropriate clinical assessment when symptoms suggest a more serious underlying condition.

Safety is an important consideration. Low back pain has multiple potential causes, and exercise should be prescribed following appropriate clinical assessment. Symptoms suggesting serious pathology, neurological compromise, significant trauma, or other specific causes require appropriate medical evaluation rather than routine exercise progression. WHO distinguishes non-specific low back pain from pain associated with specific underlying disease or structural problems.

Thus, exercise-based rehabilitation can be incorporated into a comprehensive clinical pathway rather than functioning as an isolated treatment. The most appropriate programme should reflect individual impairments, goals, occupational demands, preferences, and tolerance. This individualized approach is consistent with WHO's emphasis on person-centred, integrated, and coordinated care for persistent low back pain.

V. CONCLUSION

Postural low back pain is associated with considerable limitations in physical activity, occupational performance, and daily functioning. Although conventional treatment can provide important symptomatic and supportive care, exercise-based rehabilitation offers an active approach directed toward improving flexibility, strength, endurance, movement control, and functional capacity. The available evidence supports structured exercise as an important component of non-surgical management of chronic primary low back pain.

The comparative value of exercise-based rehabilitation lies in its ability to address physical factors that may contribute to persistent functional limitation. Stretching can be used to improve relevant mobility restrictions, while strengthening and stabilization exercises can improve muscular capacity and movement control. Postural education and progressive functional training can further support transfer of rehabilitation gains into everyday activities. These interventions should be individually prescribed and progressed according to clinical response.

Conventional care remains relevant because patients may require education, symptom management, physical therapy, and other appropriate interventions during recovery. Exercise should therefore not necessarily replace conventional treatment. Instead, structured rehabilitation can be integrated with suitable conventional care to provide a broader management strategy. WHO similarly recommends a holistic and person-centred approach in which different interventions may be combined according to individual needs.

In conclusion, exercise-based rehabilitation provides a clinically meaningful framework for managing postural low back pain, particularly when the programme is progressive, individualized, and focused on functional recovery. Future comparative studies should use standardized exercise protocols, adequate sample sizes, validated outcome measures, longer follow-up periods, and careful monitoring of adherence. Such research can clarify which combinations of stretching, strengthening, stabilization, and conventional treatment provide the greatest improvements in functional recovery.

REFERENCES

World Health Organization. (2023). *WHO guideline for non-surgical management of chronic primary low back pain in adults in primary and community care settings*. World Health Organization.

World Health Organization. (2023). *Low back pain*. World Health Organization.

World Health Organization. (2023). *Package of interventions for rehabilitation: Module 2: Musculoskeletal conditions*. World Health Organization.

World Health Organization. (2023). *WHO releases guidelines on chronic low back pain*. World Health Organization.

World Health Organization. (2023). *Web Annex D.B1: Structured exercise therapies or programmes*. World Health Organization.

World Health Organization. (2024). *WHO guideline for non-surgical management of chronic primary low back pain in adults in primary and community care settings: Executive summary*. World Health Organization.

GBD 2021 Low Back Pain Collaborators. (2023). Global, regional, and national burden of low back pain, 1990–2020, its attributable risk factors, and projections to 2050: A systematic analysis of the Global Burden of Disease Study 2021. *The Lancet Rheumatology*, 5, e316–e329.

Schaafsma, F. G., Schonstein, E., Whelan, K. M., Ulvestad, E., Kenny, D. T., & Verbeek, J. H. (2013). Physical conditioning programs for improving work outcomes in workers with back pain. *Cochrane Database of Systematic Reviews*.

World Health Organization. (2024). *Guideline development for management of chronic primary low back pain in adults*. World Health Organization.

World Health Organization. (2023). *Package of interventions for rehabilitation: Literature reviews and evidence tables for musculoskeletal conditions*. World Health Organization.