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Efficacy of Myofascial Release versus Positional Release Technique on Pain and Functional Ability in Patients with Mechanical Low Back Pain

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ABSTRACT

Background: Mechanical low back pain is a common musculoskeletal disorder in which pain, disability, restricted lumbar movement, and myofascial dysfunction can interfere with daily activities. Myofascial Release (MFR) and Positional Release Technique (PRT) are manual therapy approaches that act through different mechanical and neurophysiological mechanisms. Objective: To compare the efficacy of MFR and PRT on pain intensity, functional ability, and lumbar range of motion in patients with mechanical low back pain. Methods: A randomized clinical trial with a two-group parallel design was conducted in the Physiotherapy Department of People's Hospital. Thirty participants were recruited and allocated equally to Group A (MFR, n=15) and Group B (PRT, n=15). Both groups received three sessions per week for four weeks (12 sessions), with each session lasting approximately 45 minutes. Pain was assessed by the Visual Analogue Scale (VAS), functional disability by the Oswestry Disability Index (ODI), and lumbar mobility by the modified Schober's test. Paired t-tests assessed within-group change, independent t-tests assessed between-group differences, and Pearson correlation examined the relationship between pain reduction and functional improvement. Results: VAS scores improved significantly in both groups: MFR from 6.92±1.15 to 2.35±0.78 and PRT from 6.85±1.22 to 2.52±0.84 (both $p<0.001$). The post-intervention VAS difference between groups was not significant ($p=0.570$). ODI improved from 44.1±8.2% to 19.2±5.1% in the MFR group and from 43.8±7.9% to 24.1±6.3% in the PRT group (both $p<0.001$); the greater mean ODI improvement with MFR (24.9 vs 19.7 percentage points) was significant ($p=0.003$). Lumbar flexion and extension increased significantly in both groups. Pain reduction and functional improvement showed a strong positive correlation ($r=0.79$, $p<0.001$). Conclusion: Both MFR and PRT are effective for pain reduction in mechanical low back pain, but MFR produced greater improvement in functional disability and may be preferred when the rehabilitation goal is broader functional restoration.

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Keywords: Mechanical low back pain; Myofascial Release; Positional Release Technique; Visual Analogue Scale; Oswestry Disability Index; lumbar range of motion.

1. INTRODUCTION

Mechanical low back pain (MLBP) is a major musculoskeletal problem characterized by pain, muscular tension, or stiffness in the lumbar region that is influenced by posture, movement, physical loading, or other mechanical factors. The thesis identifies low back pain as an important contributor to disability and loss of productivity, particularly among working-age adults. Unlike back pain caused by systemic disease, infection, fracture, tumor, or neurological compromise, mechanical low back pain is closely related to the functional behavior of the lumbar spine, surrounding musculature, ligaments, and myofascial tissues [1].

The thoracolumbar fascia (TLF) has an important biomechanical role in the lumbar region. It is a multilayered connective-tissue structure that surrounds the deep spinal musculature and contributes to force transmission between the trunk, pelvis, and extremities. The thesis literature emphasizes that fascia is not simply a passive wrapping structure; it contains sensory and nociceptive elements and participates in proprioception, load transfer, and coordinated movement [2]. When fascial layers lose normal sliding behavior because of increased tissue viscosity, fibrosis, or localized restriction, mechanical loading can become inefficient and painful. Such changes may coexist with myofascial trigger points and protective muscle hypertonicity.

Manual therapy is frequently used in the conservative management of MLBP because it can address tissue restriction, pain sensitivity, and altered movement without relying solely on pharmacological treatment. Two manual therapy approaches highlighted in the thesis are Myofascial Release (MFR) and Positional Release Technique (PRT). MFR is a direct or semi-direct technique in which sustained, low-load pressure and stretch are applied to restricted fascia with the aim of improving tissue extensibility, reducing abnormal tension, and restoring more normal movement between tissue layers. The thesis protocol combined gross fascial stretching, including a leg-pull maneuver, with sustained direct pressure to lumbar and gluteal fascial restrictions.

PRT, also referred to as strain-counterstrain in the thesis, is an indirect technique. Instead of stretching a painful or shortened tissue, the involved segment is positioned in a posture of maximum comfort or 'ease.' Tenderness is reduced, the position is maintained for approximately 90 seconds, and the patient is returned slowly to neutral. The proposed mechanism described in the thesis is a reduction in abnormal muscle spindle activity and neural hypertonicity, thereby interrupting the pain-spasm cycle [4]. This makes PRT clinically attractive in patients who are sensitive to direct pressure or forceful movement.

Evidence summarized in the thesis supports both approaches but does not establish a consistent advantage for one technique across all outcomes. Fairbank and Pynsent established the Oswestry Disability Index as a key measure of functional disability in low back pain [5]. Comparative and review evidence cited in the thesis shows that MFR can improve pain, disability, fascial mobility, and physical function, while PRT can reduce tender-point

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sensitivity, pain, and muscle hypertonicity. The thesis also cites comparative work suggesting similar analgesic effects for MFR and PRT, alongside evidence that broader fascial techniques may have stronger effects on function and mobility [6-13].

The clinical question is therefore not merely whether MFR or PRT reduces pain, but whether their different mechanisms lead to different degrees of functional recovery. Pain relief is important, but rehabilitation success in mechanical low back pain also depends on the patient's ability to sit, stand, walk, lift, bend, and perform daily tasks. A technique that produces similar pain reduction but greater functional improvement could have meaningful implications for routine physiotherapy practice.

The present study directly compared MFR and PRT under a standardized four-week treatment schedule. Pain intensity, functional disability, lumbar flexion and extension, and the relationship between pain reduction and functional improvement were examined. By comparing a direct myofascial approach with an indirect positional approach, the study sought to provide a practical basis for selecting manual therapy according to the dominant rehabilitation goal.

2. AIM AND OBJECTIVES

The aim of the study was to compare the efficacy of Myofascial Release versus Positional Release Technique on pain intensity and functional ability in patients diagnosed with mechanical low back pain.

The specific objectives were:

- To evaluate the effect of MFR on pain intensity using the Visual Analogue Scale (VAS).
- To evaluate the effect of MFR on functional ability using the Oswestry Disability Index (ODI).
- To evaluate the effect of PRT on pain intensity using the VAS.
- To evaluate the effect of PRT on functional ability using the ODI.
- To compare post-intervention effectiveness of MFR and PRT on pain and functional ability, while also examining lumbar range of motion.

3. MATERIALS AND METHODS

3.1 Study design and setting

The research was conducted as a randomized clinical trial using a two-group parallel design. Participants were recruited through a purposive clinical sampling approach and were then allocated to the two intervention groups by a simple lottery method. The study was carried out in the Physiotherapy Department of People's Hospital, where treatment and outcome measurement could be performed in a standardized clinical environment.

3.2 Participants and sample size

A total of 30 participants with mechanical low back pain were included. The thesis abstract reports an adult age range of 20–50 years. Fifteen participants were assigned to Group A and received Myofascial Release, while 15 participants were assigned to Group B and received Positional Release Technique. Baseline demographic and clinical characteristics were comparable between the two groups.

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3.3 Selection criteria

Eligible participants had clinically diagnosed mechanical low back pain of more than four weeks' duration, at least one active myofascial trigger point or tender point in the lumbar paraspinal, quadratus lumborum, or gluteal region, and an ODI score representing moderate to severe functional limitation. Participants were excluded when the clinical presentation involved spinal fracture, tumor, infection, neurological deficit, radiculopathy, spinal cord compromise, systemic inflammatory disease, recent spinal surgery or injection, pregnancy, or severe psychological disturbance likely to interfere with pain reporting.

3.4 Outcome measures

Pain intensity was measured with a 10-cm Visual Analogue Scale (VAS), where 0 represented no pain and 10 represented unbearable pain. Functional ability was evaluated using the Oswestry Disability Index (ODI), a 10-section questionnaire covering activities such as personal care, lifting, walking, sitting, standing, and social life. Lumbar mobility was assessed with the modified Schober's test, recording lumbar flexion and extension in centimeters. These measures were collected at baseline and after the four-week intervention period.

3.5 Intervention protocol

Both groups received three treatment sessions per week for four consecutive weeks, giving a total of 12 sessions per participant. Each session lasted approximately 45 minutes, including manual therapy and a standardized rest period.

Group A – Myofascial Release (MFR):

- Participants were positioned prone, with a small pillow under the abdomen to reduce excessive lumbar lordosis.
- A gross fascial stretch using a leg-pull technique was applied to engage the posterior myofascial chain.
- Direct sustained pressure was applied with the palms or ulnar border of the hand to identified lumbar and gluteal fascial restrictions.
- Pressure was maintained for approximately 90–120 seconds at each restriction until a palpable release or softening was perceived.

Group B – Positional Release Technique (PRT):

- The therapist identified the most sensitive tender point in the lumbar musculature, commonly near the spinous processes or medial to the posterior superior iliac spine.

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- The patient was moved passively into a position of ease that reduced tenderness by at least 70%.
- The position of ease was maintained for 90 seconds with light monitoring contact over the tender point.
- The patient was returned slowly to neutral and the tender point was reassessed.

3.6 Statistical analysis

Data from the 30 participants were analyzed in SPSS Version 25.0. Means and standard deviations were used to summarize continuous variables. Paired t-tests assessed pre- to post-intervention change within each group. Independent t-tests were used for between-group comparisons. Pearson's correlation coefficient (r) examined the association between reduction in VAS pain and improvement in ODI. Statistical significance was set at $p<0.05$.

3.7 Ethical considerations

The study was conducted after Institutional Ethics Committee approval and written informed consent. Participation was voluntary, confidentiality was maintained using coded identifiers, and participants could withdraw without affecting routine treatment. Standard physiotherapy safety precautions were followed during both interventions.

4. RESULTS

The two groups were comparable at baseline for age, gender distribution, VAS pain intensity, and ODI functional disability. This baseline similarity supported interpretation of subsequent changes as treatment-related rather than the result of large initial group differences.

Table 1. Demographic distribution and baseline characteristics

Characteristic	Group A (MFR) n=15	Group B (PRT) n=15	p-value
Age (years, mean ± SD)	34.5 ± 7.2	35.2 ± 6.8	0.786
Gender (male/female)	8/7	8/7	1.000
Baseline VAS (mean ± SD)	6.92 ± 1.15	6.85 ± 1.22	0.873
Baseline ODI (%)	44.1 ± 8.2	43.8 ± 7.9	0.919

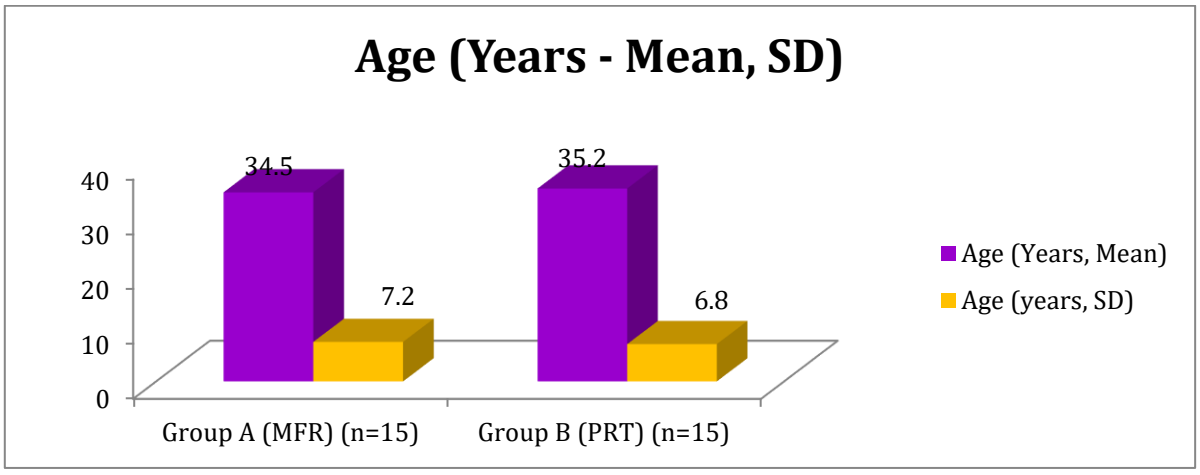

Figure 1. Demographic Distribution of Cases (Age)

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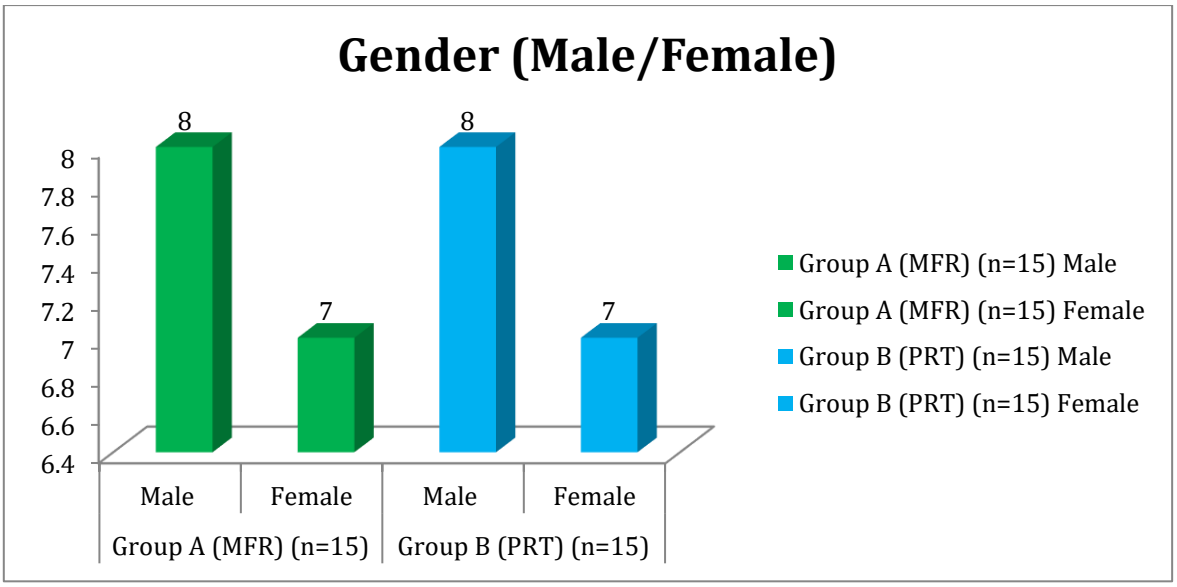

Figure 2. Demographic Distribution of Cases (Gender)

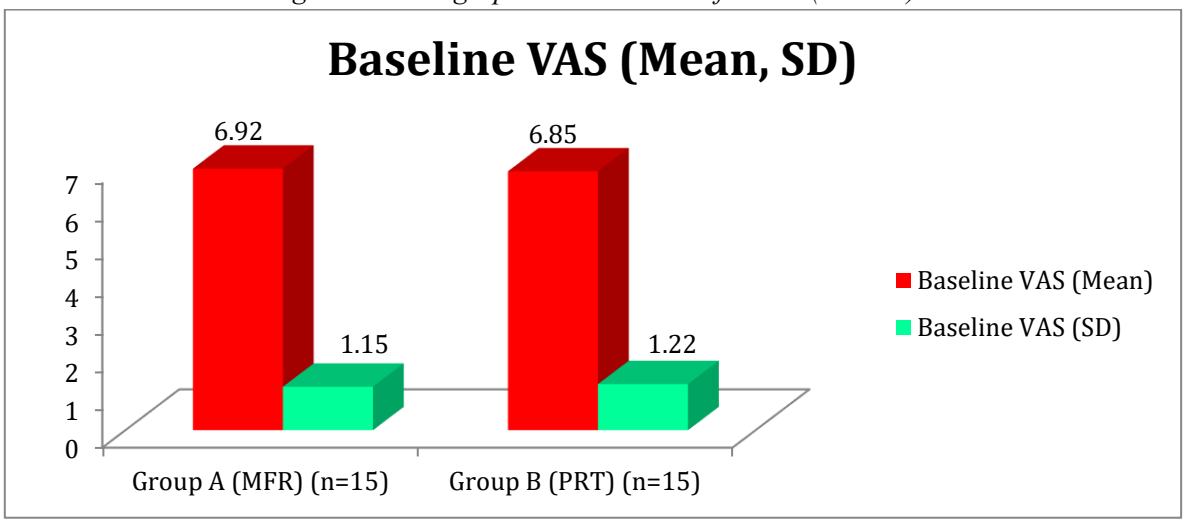

Figure 3. Baseline Characteristics of Cases (Baseline VAS)

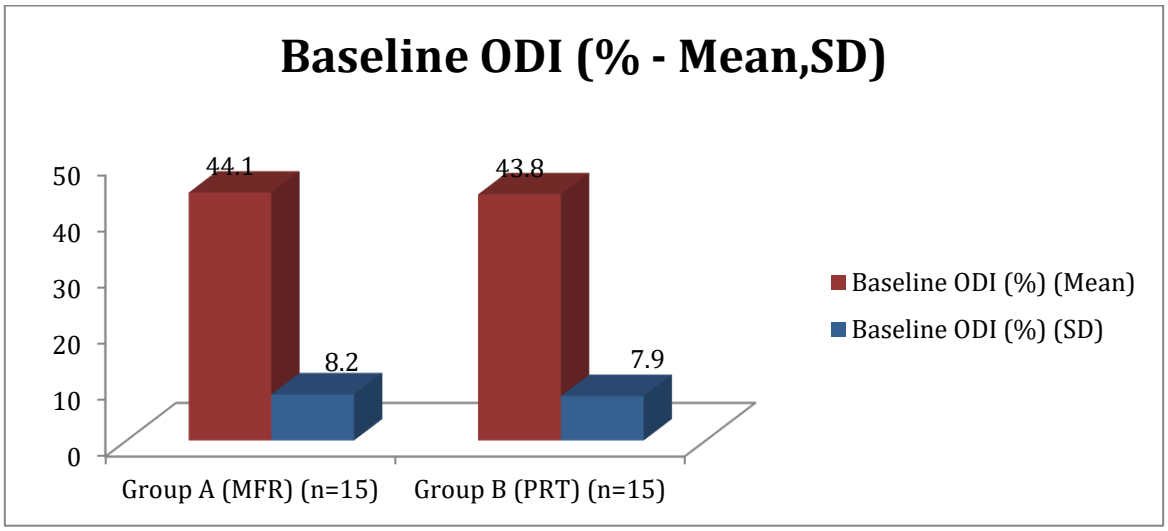

Figure 4. Baseline Characteristics of Cases (Baseline ODI)

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4.1 Pain intensity (VAS)

MFR produced a large within-group reduction in pain, with mean VAS decreasing from 6.92±1.15 to 2.35±0.78 (mean reduction 4.57 points; t=18.42; p<0.001). PRT also produced a large reduction, from 6.85±1.22 to 2.52±0.84 (mean reduction 4.33 points; t=16.58; p<0.001). The post-intervention between-group comparison reported in the thesis table was not statistically significant (mean difference −0.17; t=−0.57; p=0.570), indicating comparable analgesic effectiveness.

Table 2. VAS outcomes within and between groups

Comparison	Pre-intervention	Post-intervention	Mean change	t-value	p-value
Group A (MFR)	6.92 ± 1.15	2.35 ± 0.78	4.57	18.42	<0.001
Group B (PRT)	6.85 ± 1.22	2.52 ± 0.84	4.33	16.58	<0.001
Post-treatment A vs B	—	2.35 vs 2.52	−0.17	−0.57	0.570

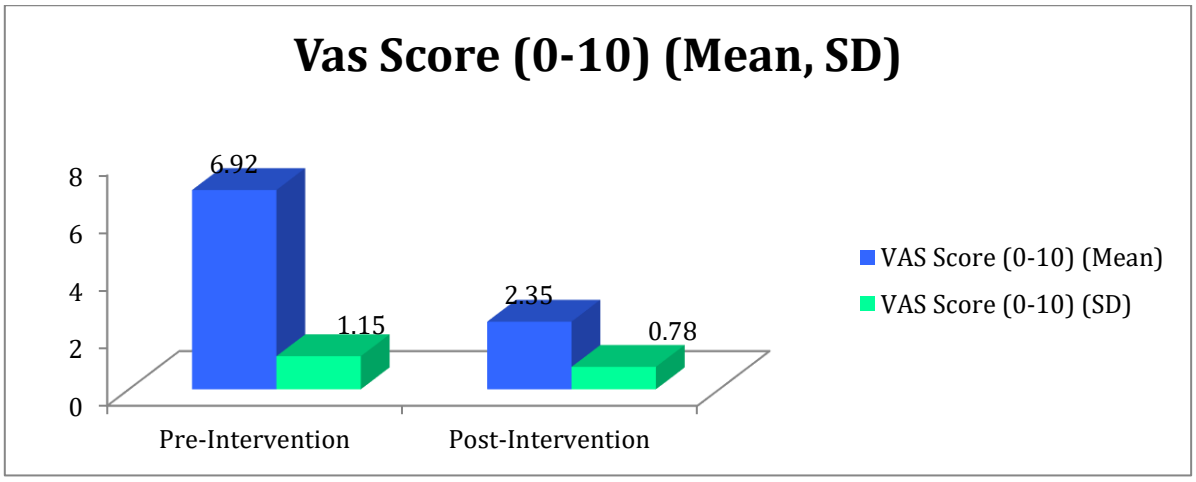

Figure 5. Within-Group Analysis of VAS Scores (Group A – MFR)

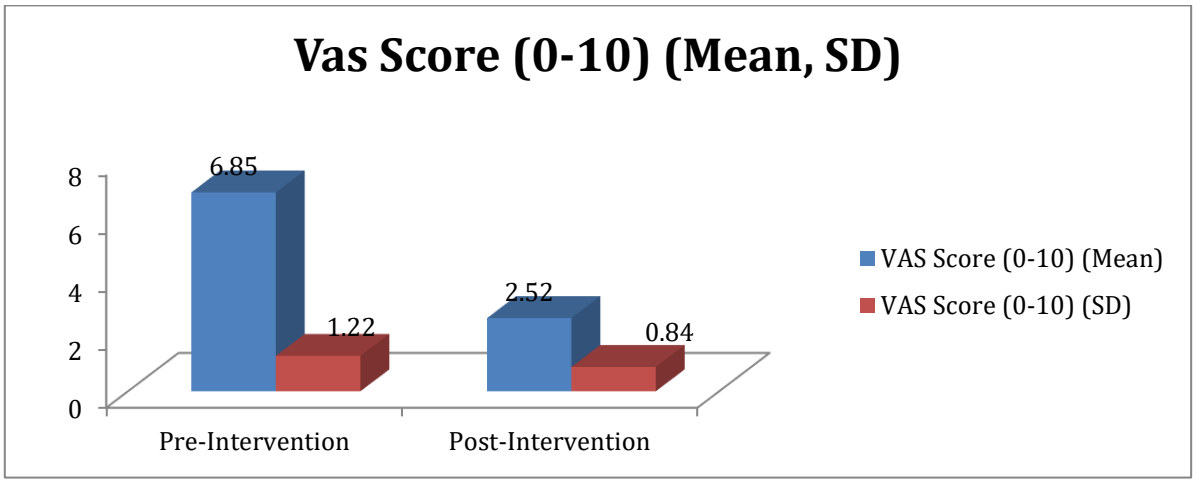

Figure 6. Within-Group Analysis of VAS Scores (Group B – PRT)

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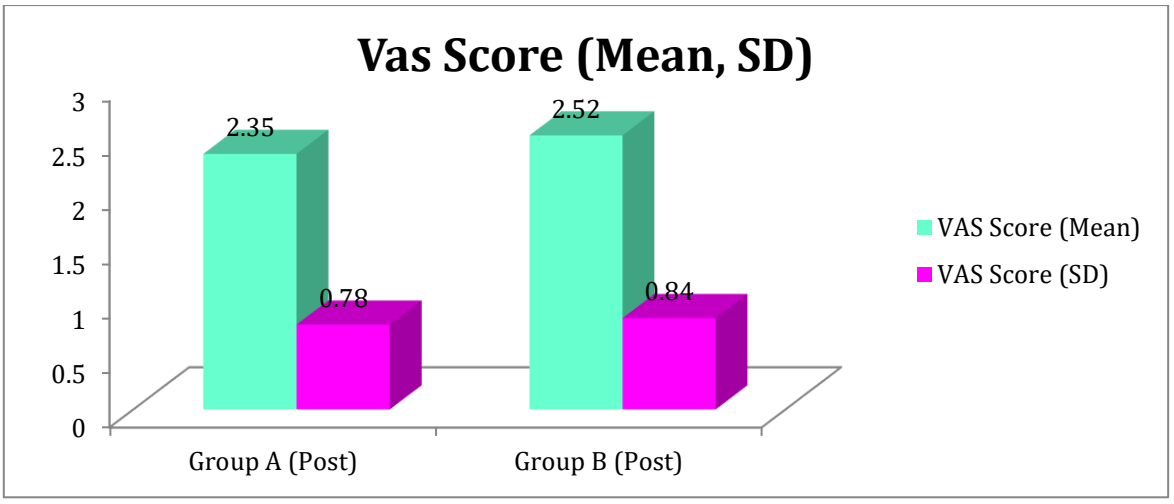

Figure 7. Between-Group Comparison of Post-Intervention VAS Scores

4.2 Functional disability (ODI)

Functional disability improved significantly in both groups, but the magnitude of change was greater with MFR. In Group A, mean ODI decreased from 44.1±8.2% to 19.2±5.1%, a mean improvement of 24.9 percentage points (t=14.12; p<0.001). In Group B, ODI decreased from 43.8±7.9% to 24.1±6.3%, a mean improvement of 19.7 percentage points (t=12.84; p<0.001). The between-group comparison of mean ODI improvement favored MFR (t=3.27; p=0.003).

Table 3. ODI outcomes within and between groups

Comparison	Pre-intervention	Post-intervention	Mean improvement	t-value	p-value
Group A (MFR)	44.1 ± 8.2%	19.2 ± 5.1%	24.9	14.12	<0.001
Group B (PRT)	43.8 ± 7.9%	24.1 ± 6.3%	19.7	12.84	<0.001
Mean improvement A vs B	—	—	24.9 vs 19.7	3.27	0.003

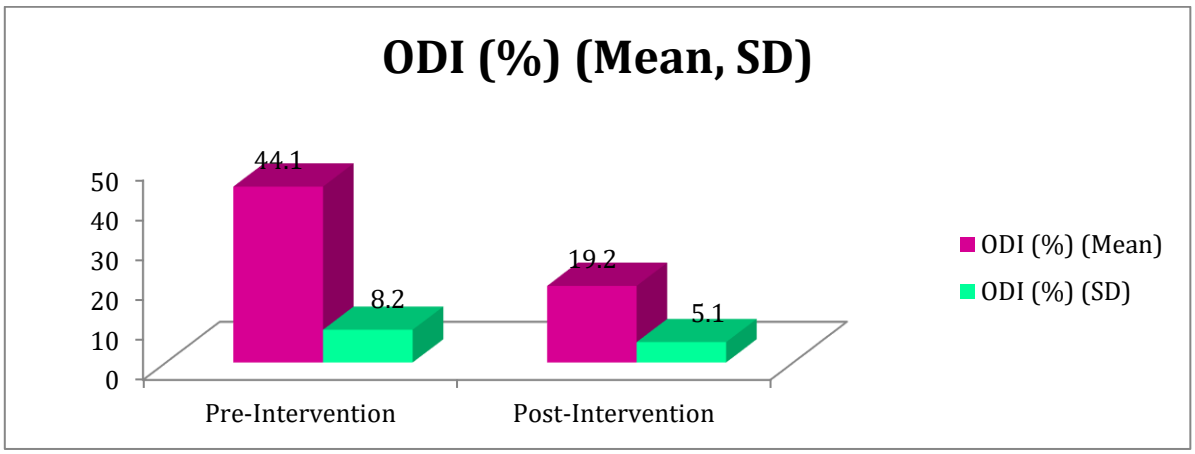

Figure 8. Within-Group Analysis of ODI Scores (Group A – MFR)

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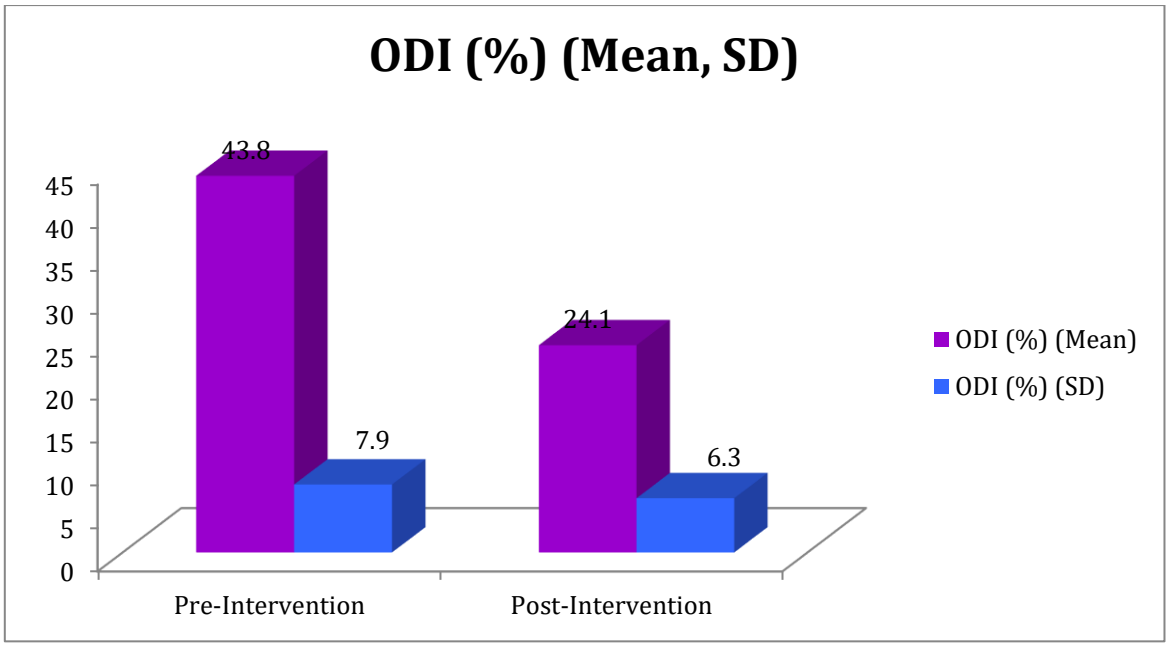

Figure 9. Within-Group Analysis of ODI Scores (Group B – PRT)

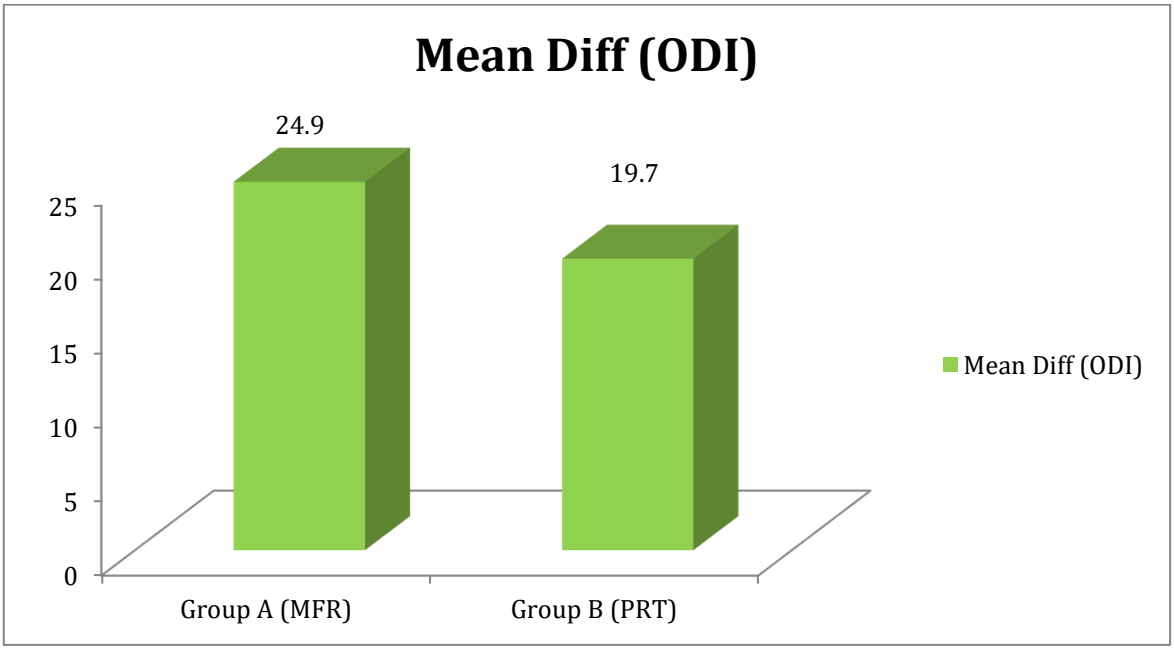

Figure 10. Between-Group Comparison of Mean Difference in ODI Percentage

4.3 Lumbar range of motion

Lumbar flexion and extension improved significantly within both intervention groups. Flexion increased from 12.1±1.2 cm to 16.8±1.4 cm in the MFR group (mean gain 4.7 cm; $p<0.001$) and from 11.8±1.1 cm to 15.2±1.3 cm in the PRT group (mean gain 3.4 cm; $p<0.001$). Extension increased from 14.2±2.1 cm to 18.5±2.4 cm in the MFR group (mean gain 4.3 cm; $p<0.001$) and from 13.9±2.2 cm to 18.1±2.3 cm in the PRT group (mean gain 4.2 cm; $p<0.001$). Thus, both techniques improved lumbar mobility; the reported descriptive gain in flexion was larger in the MFR group.

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Table 4. Lumbar range of motion measured with the modified Schober's test

Outcome	Group	Pre-intervention	Post-intervention	Mean change	p-value
Flexion (cm)	MFR	12.1 ± 1.2	16.8 ± 1.4	4.7	<0.001
Flexion (cm)	PRT	11.8 ± 1.1	15.2 ± 1.3	3.4	<0.001
Extension (cm)	MFR	14.2 ± 2.1	18.5 ± 2.4	4.3	<0.001
Extension (cm)	PRT	13.9 ± 2.2	18.1 ± 2.3	4.2	<0.001

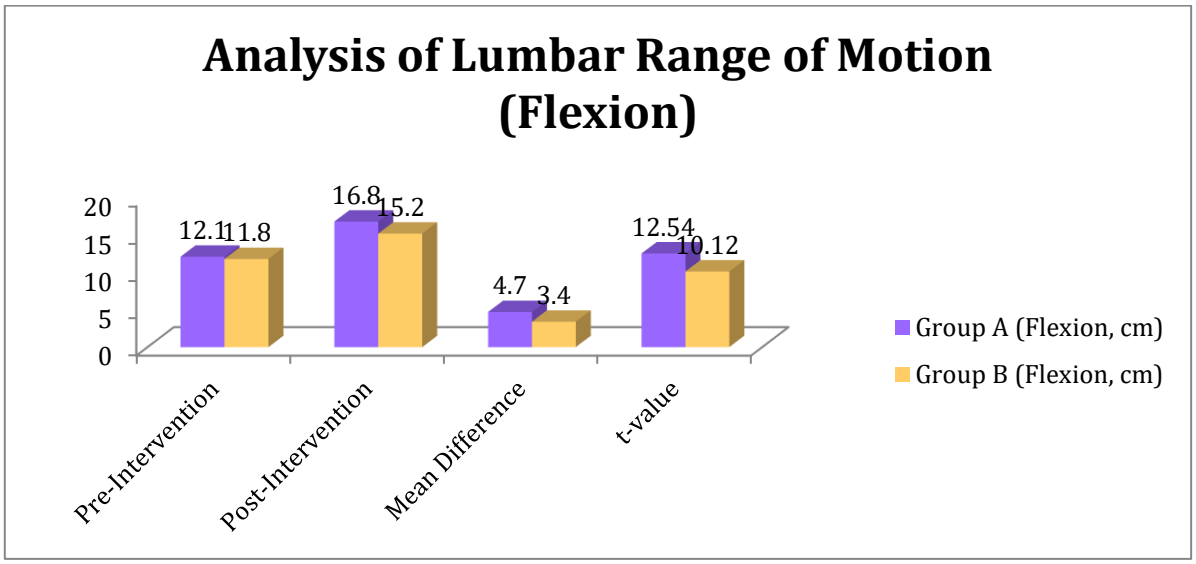

Figure 11. Within-Group Analysis of Lumbar Range of Motion (Flexion)

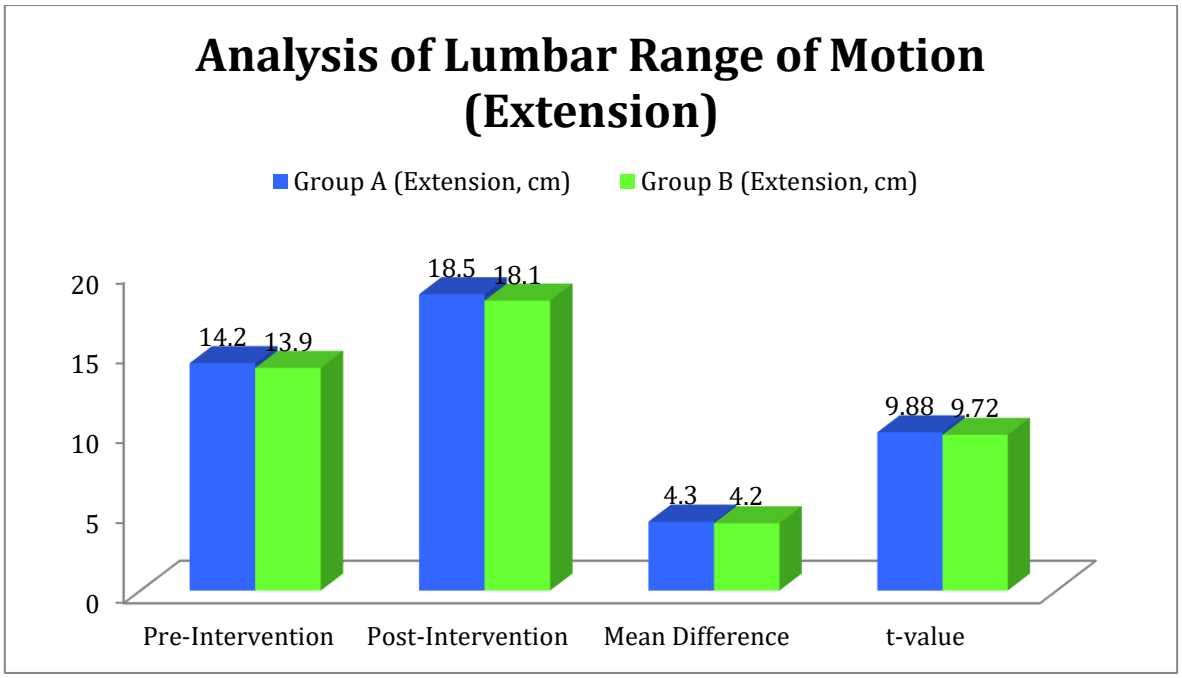

Figure 12. Within-Group Analysis of Lumbar Range of Motion (Extension)

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4.4 Relationship between pain reduction and functional improvement

A strong positive correlation was reported between the reduction in VAS pain and improvement in ODI ($r=0.79$, $p<0.001$; $n=30$). The finding indicates that participants who experienced larger reductions in pain also tended to show larger improvements in functional ability.

Table 5. Correlation between pain reduction and functional improvement

Variables	Sample size (n)	Pearson r	p-value
VAS difference vs ODI difference	30	0.79	<0.001

5. Discussion

The study compared two manual therapy strategies that approach mechanical low back pain from different directions. MFR applies sustained mechanical loading to restricted fascia and myofascial chains, whereas PRT reduces tissue tension by positioning the painful structure in a shortened, comfortable posture. The central finding was that both techniques produced substantial pain relief over four weeks, while MFR produced a greater improvement in functional disability. This pattern suggests that pain modulation and functional restoration are related but not identical treatment targets.

The reduction in VAS was large in both groups. MFR lowered mean VAS by 4.57 points and PRT by 4.33 points, and the post-treatment difference between groups was not statistically significant. This agrees with comparative evidence summarized in the thesis, including Kim and Vispute, in which direct and indirect manual techniques produced similar analgesic effects [7,8]. The finding is clinically plausible because pain can be influenced through several mechanisms. Direct fascial work may reduce local tissue restriction, alter mechanical input to nociceptive structures, and improve sliding between fascial layers, while PRT may reduce muscle spindle activity and protective hypertonicity through a position-of-ease response.

The thesis discussion relates the MFR response to changes in the thoracolumbar fascia. Research cited in the literature review describes the TLF as a highly innervated structure that participates in force transmission and may develop altered thickness or sliding behavior in low back pain [2,9,10]. Sustained manual loading could therefore influence both mechanical stiffness and sensory input. The broad leg-pull component used in the MFR protocol may also engage a larger portion of the posterior myofascial chain rather than treating only a single local tender point [12].

PRT produced an equally meaningful reduction in pain despite using much less direct tissue loading. This supports the neurophysiological explanation outlined in the thesis: positioning the painful tissue in maximum comfort may decrease abnormal spindle activity, reduce guarding, and interrupt the pain-spasm cycle [4,16]. In clinical practice this can be valuable when direct pressure is poorly tolerated, when the region is acutely tender, or when the clinician wishes to reduce pain before progressing to more active or mechanically demanding interventions.

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The most important between-group difference emerged in the ODI. Both groups improved markedly, but the MFR group improved by 24.9 percentage points compared with 19.7 percentage points in the PRT group, and this difference was statistically significant. The post-treatment mean ODI of 19.2% in the MFR group was lower than the PRT mean of 24.1%. The thesis interprets this as evidence that MFR has a broader influence on tasks such as lifting, sitting, walking, and other activities included in the ODI.

This functional advantage is consistent with the thesis review of MFR evidence. Systematic review and meta-analytic evidence cited in the thesis reports improvement in pain and physical function with myofascial release for chronic low back pain [3]. The thesis also draws on Arguisuelas and related fascial studies to suggest that changes in tissue mobility and sliding may contribute to improved movement [9]. If MFR reduces restrictions across a larger myofascial region, the patient may gain not only symptomatic pain relief but also more efficient movement during activities that depend on lumbopelvic load transfer.

The lumbar range-of-motion findings add support to this interpretation. Flexion and extension improved significantly in both groups. The mean gain in flexion was 4.7 cm in the MFR group compared with 3.4 cm in the PRT group, whereas extension gains were very similar (4.3 vs 4.2 cm). These results suggest that the functional advantage of MFR may be related particularly to movement patterns requiring posterior tissue elongation and fascial glide. At the same time, because the thesis tables provide within-group significance for these measures and do not present a complete between-group inferential analysis for each ROM outcome, the ROM findings should be interpreted primarily as supportive rather than definitive evidence of superiority.

The strong correlation between pain reduction and ODI improvement ($r=0.79$) is clinically relevant. It shows that symptom reduction and functional recovery moved in the same direction for most participants. Nevertheless, the significant difference in ODI improvement despite similar post-treatment VAS scores indicates that pain alone does not fully explain function. A patient may report a comparable level of pain yet differ in mobility, confidence, tissue tolerance, or capacity to perform daily tasks. This reinforces the importance of measuring disability and movement in addition to pain intensity.

The findings have practical implications for treatment selection. When the immediate clinical priority is analgesia in a highly tender patient, PRT offers a low-force strategy that produced strong pain reduction in this study. When the priority includes restoration of daily function and broader movement capacity, MFR may be the more appropriate primary manual technique. The thesis therefore proposes a goal-directed approach rather than treating one method as universally superior. It also raises the possibility that combining the two methods sequentially—PRT for early pain modulation followed by MFR for structural mobility—could be investigated in future trials.

The study should also be viewed in the context of its scale and design. The sample included only 30 participants from a single clinical setting and follow-up ended after four weeks. Manual therapy research also cannot easily blind the treating therapist. In addition, psychosocial variables such as kinesiophobia, pain catastrophizing, anxiety, and depression were not

included even though they can influence pain reporting and disability. These limitations mean that the observed functional advantage of MFR should be confirmed in larger, multicenter trials with longer follow-up and broader biopsychosocial assessment.

Overall, the results support both MFR and PRT as clinically useful interventions for mechanical low back pain. The study's contribution lies in distinguishing comparable pain relief from differential functional recovery. MFR and PRT appear to share the ability to reduce pain, but the broader myofascial approach used in the MFR group was associated with greater improvement in ODI and a larger descriptive gain in lumbar flexion.

6. Clinical Implications

- Both MFR and PRT can be considered when the principal goal is reduction of pain in mechanical low back pain.
- MFR may be preferred when improving functional disability and restoring broader movement capacity are central treatment goals.
- PRT may be particularly useful as a comfortable low-force option in patients with pronounced tenderness or intolerance to direct manual pressure.
- Outcome evaluation should include functional disability and lumbar mobility in addition to pain intensity because similar pain scores do not necessarily indicate equivalent functional recovery.
- The thesis findings provide a rationale for studying staged or combined protocols in which PRT is used for early symptom reduction and MFR is subsequently used to address persistent myofascial restriction.

7. Limitations

- The sample size was small (n=30) and was drawn from a single clinical setting, which limits generalizability.
- Outcomes were evaluated only over a four-week treatment period; maintenance of benefits at six months or one year was not established.
- Therapist blinding was not feasible because both interventions were hands-on manual therapy techniques.
- Psychosocial variables such as kinesiophobia, catastrophizing, anxiety, and depression were not incorporated into the analysis.

8. Future Scope

- Future multicenter studies should use larger samples and longer follow-up to determine durability of pain and functional improvements.
- Sequential protocols combining PRT for early pain reduction with MFR for tissue restriction should be compared with either technique used alone.

- Objective biomechanical measures such as ultrasound-based fascial tracking or electromyography could be incorporated to clarify changes in fascial sliding and muscle recruitment.
- Future research may phenotype patients according to dominant mechanical loading, tissue sensitivity, or central sensitization to determine whether specific subgroups respond preferentially to MFR or PRT.

9. Conclusion

This randomized clinical trial found that both Myofascial Release and Positional Release Technique produced statistically significant and clinically meaningful reductions in pain among patients with mechanical low back pain. The two interventions did not differ significantly in post-treatment VAS pain, indicating that both are effective analgesic manual therapy options. However, MFR produced a significantly greater improvement in ODI functional disability and a larger descriptive improvement in lumbar flexion. The strong association between pain reduction and functional improvement further supports the value of addressing both symptom intensity and daily functional capacity. Within the limits of the study, MFR appears preferable when the rehabilitation objective extends beyond pain relief to broader functional restoration, while PRT remains a useful low-force technique for pain-sensitive presentations.

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