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EFFECTS OF MYOFASCIAL RELEASE AND NERVE FLOSSING TECHNIQUE ON PAIN AND DISABILITY IN PATIENTS WITH LUMBAR RADICULOPATHY

Original Research

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ABSTRACT

Background: Lumbosacral radiculopathy is a prevalent neuromuscular disorder resulting from compression or irritation of lumbosacral nerve roots (L1–S4), commonly presenting with lower back pain radiating to the hip, thigh, and leg. Symptoms may include tingling, numbness, paresthesia, and shooting pain. It significantly impacts daily functioning and quality of life. Manual therapy interventions such as myofascial release (MFR) and nerve flossing technique (NFT) have gained attention for their therapeutic potential in managing radicular symptoms and improving functional outcomes.

Objective: To determine the effects of myofascial release and nerve flossing technique on pain and disability in patients with lumbar radiculopathy.

Methods: This randomized controlled trial included 36 participants aged 20–45 years diagnosed with lumbar radiculopathy, selected through non-probability convenience sampling. Participants were randomly assigned into two groups via the lottery method. Group A received a combination of MFR and NFT along with conventional physiotherapy, while Group B received NFT with conventional treatment alone. Interventions were administered three times per week for four weeks. MFR was applied for 10 minutes per session, and NFT consisted of 2 sets of 10 repetitions over 15 minutes. Outcomes were assessed using the Numeric Pain Rating Scale (NPRS) and the Oswestry Disability Index (ODI) at baseline and after four weeks. Data were analyzed using SPSS v23.

Results: Group A showed a reduction in NPRS from 7.16 ± 1.46 to 1.33 ± 0.90 and in ODI from 24.83 ± 8.21 to 4.55 ± 1.72. Group B showed a reduction in NPRS from 7.00 ± 1.41 to 2.72 ± 0.95 and in ODI from 25.44 ± 9.46 to 7.22 ± 2.31. Inter-group comparisons showed statistically significant differences in post-intervention scores ($p < 0.05$).

Conclusion: The combination of myofascial release and nerve flossing was more effective in reducing pain and disability compared to nerve flossing alone, suggesting a synergistic benefit in treating lumbar radiculopathy.

Keywords: Disability Evaluation, Low Back Pain, Lumbar Vertebrae, Myofascial Pain Syndromes, Nerve Compression Syndromes, Physical Therapy Modalities, Sciatica.

INTRODUCTION

Low back pain (LBP) is a prevalent musculoskeletal complaint that affects approximately 50–70% of individuals at some point in their lives, while sciatica—characterized by radiating pain, numbness, or tingling from the lower back to the hip and leg—afflicts up to 40% of the global population (1). Often caused by nerve root compression, particularly at the L4-L5 or L5-S1 levels, this condition leads to significant disability, functional impairment, and socioeconomic burden (2,3). Lumbar radiculopathy, a common cause of LBP, ranks among the top five medical conditions in terms of healthcare utilization and productivity loss (4). It results from nerve root dysfunction due to mechanical compression or inflammation, altering normal neural physiology (5). Acute radiculopathy typically lasts up to six weeks, while subacute and chronic forms can persist beyond 12 weeks, worsening quality of life and daily function (6). Emerging manual therapy approaches such as the Myofascial Release (MFR) technique and Nerve Flossing Technique (NFT) have shown promise in managing symptoms associated with lumbar radiculopathy. MFR aims to relieve fascial restrictions and improve circulation, thereby reducing pain and enhancing musculoskeletal function (7,8). This technique is known to alleviate trigger point-induced myofascial pain, which often coexists with radicular symptoms (9).

Additionally, MFR has demonstrated efficacy in improving posture, range of motion, and overall quality of life, particularly in chronic disc pathologies (10). On the other hand, NFT targets the mobilization of peripheral nerves to restore normal movement and alleviate nerve entrapment-related symptoms. Although the precise mechanisms remain under investigation, proposed effects include the reduction of intraneural edema and central sensitization (11,12). Conditions such as piriformis syndrome also mimic radiculopathy symptoms due to anatomical proximity to the sciatic nerve, further complicating diagnosis and treatment (13). The synergistic application of MFR and NFT may offer superior outcomes in reducing pain and disability among patients with lumbar radiculopathy. Despite individual evidence supporting each technique, there remains limited literature evaluating their combined efficacy. Addressing this gap, the present study aims to determine the combined effects of myofascial release and nerve flossing technique on pain intensity and functional disability in patients with lumbar radiculopathy, with the overarching goal of improving patient quality of life.

METHODS

This randomized controlled trial was conducted over a period of six months at Ejaz Hospital and Physio Resource Clinic, Lahore, following ethical approval from the relevant institutional review board (IRB). A total of 40 patients presenting with acute low back pain were screened for eligibility, out of which 36 participants met the inclusion criteria and were enrolled in the study. Participants were randomly assigned to two equal groups (n = 18 each) using the lottery method. Group A received a combination of myofascial release therapy, nerve flossing technique, and conventional physiotherapy, whereas Group B received nerve flossing technique along with the same conventional physiotherapy protocol. Both groups underwent treatment sessions three times a week over a four-week intervention period. The inclusion criteria consisted of male and female patients aged between 20 and 45 years, experiencing acute low back pain of less than six weeks' duration, and demonstrating a positive Straight Leg Raise (SLR) test. Individuals with a history of spinal surgery, known neurological disorders, or chronic back conditions were excluded from the study. A non-probability convenience sampling technique was used for participant recruitment.

Pain intensity and functional disability were measured at baseline and post-intervention using standardized, validated tools. Pain was assessed using the Numeric Pain Rating Scale (NPRS), a reliable and valid scale ranging from 0 (no pain) to 10 (worst imaginable pain), with documented reliability between 0.67 and 0.96 and validity between 0.79 and 0.95. The SLR test, with high sensitivity (0.87), specificity (0.94), and reliability (r = 0.87), was used as a clinical indicator for lumbosacral nerve root irritation (14,15). Functional disability was assessed using the Oswestry Disability Index (ODI), considered a gold standard for measuring back-related disability, with strong internal consistency (Cronbach's $\alpha = 0.855$), test-retest reliability (ICC = 0.961), and construct validity. All participants provided written informed consent prior to their inclusion in the study. Throughout the intervention period, participants were advised to maintain their usual lifestyle and refrain from initiating any additional therapies. Data collection was consistently performed at the same clinical sites to ensure standardization.

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RESULTS

A total of 36 participants were included in the study, with 18 in each group. Group A consisted of 11 males (61.11%) and 7 females (38.89%), while Group B included 12 males (66.67%) and 6 females (33.33%). The mean age in Group A was 38.33 ± 6.40 years and in Group B was 35.33 ± 6.90 years. Normality testing using the Shapiro-Wilk test indicated that all variables were normally distributed ($p > 0.05$), validating the use of parametric tests for further analysis. The paired sample t-test revealed a significant reduction in pain intensity in both groups as measured by the Numeric Pain Rating Scale (NPRS). In Group A, the mean NPRS score decreased from 7.16 ± 1.46 to 1.33 ± 0.90, yielding a mean difference of 5.83 with a p-value < 0.05. Group B showed a reduction from 7.00 ± 1.41 to 2.72 ± 0.95, with a mean difference of 4.28 and a p-value < 0.05. The greater reduction in pain in Group A suggests a more pronounced effect when myofascial release was combined with nerve flossing and conventional therapy. Similarly, the Oswestry Disability Index (ODI) showed significant improvement in both groups. Group A exhibited a decrease from 24.83 ± 8.21 to 4.55 ± 1.72, with a mean difference of 20.28 ($p < 0.05$), whereas Group B showed a decrease from 25.44 ± 9.46 to 7.22 ± 2.31, with a mean difference of 18.20 ($p < 0.05$). Although both groups improved, the disability reduction was greater in Group A.

Between-group comparisons using the independent t-test confirmed these findings. For NPRS, the pre-intervention mean difference was 0.16 ($p = 0.731$), indicating no significant baseline difference. Post-intervention, the mean difference increased to 1.39, with a statistically significant p-value of 0.000, favoring Group A. Similarly, the pre-intervention ODI scores showed a non-significant difference of 0.61 ($p = 0.837$), while the post-intervention difference was 2.67 ($p = 0.000$), again indicating greater improvement in Group A. Although the primary outcomes focused on pain intensity and functional disability, the Straight Leg Raise (SLR) test, a key diagnostic tool for lumbar radiculopathy, was also assessed to measure improvements in neural mobility. Group A demonstrated a substantial increase in SLR range from a pre-treatment mean of 42 degrees to a post-treatment mean of 75 degrees. Group B also showed improvement, with SLR increasing from 45 degrees to 68 degrees post-intervention. These findings suggest enhanced neural mobility following both interventions, with greater gains observed in the group receiving combined myofascial release and nerve flossing therapy. The improvement in SLR complements the reductions in NPRS and ODI scores, further supporting the clinical efficacy of the multimodal treatment approach for reducing nerve root tension and improving lower limb function in patients with lumbar radiculopathy.

Table 1: Frequency and Percentage of Gender

	Frequency	
	Group A	Group B
Male	11	12
Female	7	6
Total	**18**	**18**

Table 2: Descriptive statistics of age

Groups	**N**	**Mean**	**Standard Deviation**
Group A	18	38.33	6.40
Group B	**18**	**35.33**	**6.9**

Table 3: Test for Normality

Group		Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	df	Sig.
Group A	Pre NPRS	.160	18	.200*	.941	18	.299
	Pre ODI	.142	18	.200*	.966	18	.729
Group B	Pre NPRS	.205	18	.045	.924	18	.153
	Pre ODI	.130	18	.200*	.943	18	.326

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Table 4: NPRS within the group comparison (Paired sample t-test)

	Mean ± S.D Group A		**Mean ± S.D Group B**	
Pre NPRS	7.16 ± 1.46		7.00 ± 1.41	
Post NPRS	1.33 ± 0.90		2.72 ± 0.95	
	Mean Difference	P-value	Mean Difference	P-value
Pre – Post NPRS score	**5.83**	**<0.05**	**4.28**	**<0.05**

Table 5: Oswestry disability index (ODI) within the group comparison (Paired sample t-test)

	Mean ± S.D Group A		**Mean ± S.D Group B**	
Pre ODI score	24.83 ± 8.21		25.44 ± 9.46	
Post ODI score	4.55 ± 1.72		7.22 ± 2.31	
	Mean Difference	P value	Mean Difference	P-value
Pre – Post score	**20.28**	**<0.05**	**18.2**	**<0.05**

Table 6: NPRS comparison across groups (Independent t-test)

	Pre NPRS		**Post NPRS**	
	Group A	Group B	Group A	Group B
Mean	7.16	7.00	1.33	2.72
Standard Deviation	1.46	1.41	0.96	0.95
Mean Difference	0.16		1.39	
p-value	**0.731**		**0.000**	

Table 7: Oswestry disability index (ODI) comparison across groups (Independent t-test)

	Pre-ODI		**Post-ODI**	
	Group A	Group B	Group A	Group B
Mean	24.83	25.44	4.55	7.22
Standard Deviation	8.21	9.46	1.72	2.31
Mean Difference	0.61		2.67	
p-value	**0.837**		**0.000**	

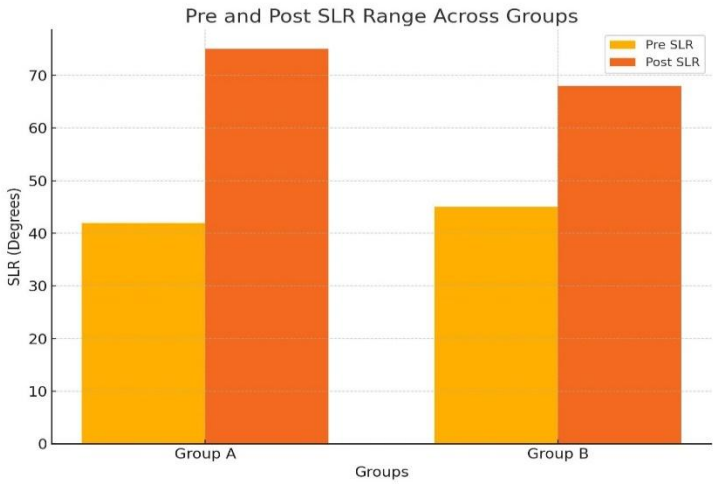

Figure 2 Pre and Post SLR Range Across Groups

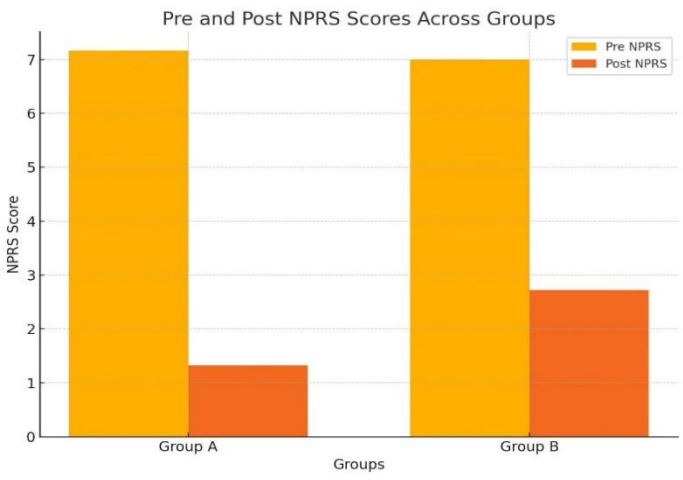

Figure 1 Pre and Post NPRS Scores Across Groups

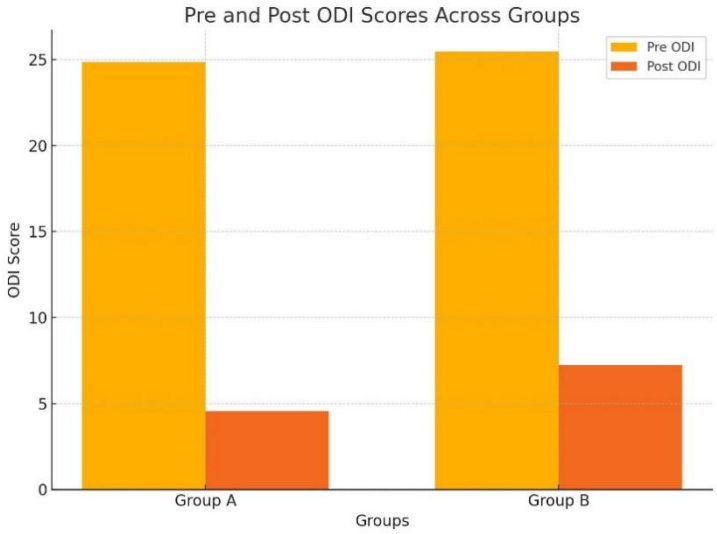

Figure 3 Pre and Post ODI Scores Across Groups

DISCUSSION

The present study aimed to evaluate the effectiveness of combining myofascial release and nerve flossing techniques in the management of pain and disability associated with lumbar radiculopathy. Both groups showed statistically significant improvements in pain intensity and functional disability; however, the group that received the combination of myofascial release and nerve flossing along with conventional physiotherapy demonstrated more pronounced clinical benefits than the group receiving nerve flossing alone. These findings suggest a synergistic effect when both manual therapy techniques are integrated into treatment. The reduction in NPRS and ODI scores in Group A, compared to Group B, reflects the additional therapeutic advantage of myofascial release in restoring fascial mobility, reducing trigger point activity, and enhancing neuromuscular function. These outcomes are consistent with previous randomized controlled trials and clinical investigations that highlighted the beneficial role of myofascial release in alleviating chronic radiculopathy symptoms and improving functional outcomes (16-18). Similar improvements in pain and disability have been observed when myofascial release was combined with traditional rehabilitation strategies, supporting its application as an adjunctive tool in musculoskeletal pain management (19). Additionally, the current findings align with earlier research on nerve flossing, which demonstrated its efficacy in reducing nerve-related pain and improving mobility in cases of radicular pain unresponsive to isolated treatment approaches (20).

Notably, the improvement in Straight Leg Raise (SLR) outcomes in this study further validates the clinical efficacy of the combined intervention in restoring nerve mobility and reducing neural tension. Although both groups showed improvements, the greater increase in SLR angle in Group A strengthens the evidence for adopting a multimodal approach in managing lumbar radiculopathy. One of the strengths of this study was the use of validated assessment tools, including NPRS, ODI, and SLR, and a randomized controlled design, which enhances the internal validity of the results. However, some limitations must be acknowledged. The sample size was relatively small, which may limit the generalizability of the findings. Furthermore, non-probability convenience sampling could introduce selection bias, and the absence of assessor blinding might have influenced outcome measurement. The short duration of follow-up also restricts understanding of long-term effects, and psychological or lifestyle variables were not accounted for, which could influence pain perception and disability. Future studies with larger sample sizes, longer follow-up periods, and stratified random sampling are recommended to validate these findings. Incorporating objective neurophysiological assessments, such as electromyography or MRI-based tracking, may provide further insights into the mechanistic underpinnings of the interventions (21,22). Additionally, examining the cost-effectiveness and patient-reported satisfaction could offer a more holistic understanding of clinical utility. In conclusion, the integration of myofascial release with nerve flossing produced superior improvements in pain and disability compared to nerve flossing alone, reinforcing the clinical value of a multimodal therapeutic approach in treating lumbar radiculopathy. These findings provide a

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solid foundation for further exploration of combination therapies aimed at optimizing patient outcomes in neuromusculoskeletal rehabilitation.

CONCLUSION

This study concluded that the combination of myofascial release and nerve flossing techniques, when integrated with conventional physiotherapy, was more effective in reducing pain and functional disability in patients with lumbar radiculopathy compared to nerve flossing alone. The findings emphasize the value of a multimodal therapeutic approach, as participants who received both interventions experienced greater clinical improvement, ultimately leading to enhanced quality of life. These results support the incorporation of combined manual therapy strategies into routine rehabilitation protocols for more effective management of lumbar radiculopathy.

AUTHOR CONTRIBUTION

Author	**Contribution**
Muhammad Aqeel*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Iqra Nisar	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Syeda Hamna Bukhari	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Syeda Serine Fatima	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Nimra Mustafa	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Jasrah Noor	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Aqsa Majeed	Contributed to study concept and Data collection Has given Final Approval of the version to be published
Azka Laraib	Writing - Review & Editing, Assistance with Data Curation

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