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Expert Opinion Article

Effects of Myofascial Release and Traditional Physiotherapy Management on Pain Intensity and Functional Disability in Patients with Nonspecific Chronic Low Back Pain: A Comparative Study

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Abstract

Background:
Chronic low back pain (CLBP) is one of the leading causes of disability and functional impairment globally. Myofascial release (MFR) and traditional physiotherapy techniques such as interferential therapy (IFT) and ultrasound therapy (US) are commonly incorporated into rehabilitation protocols. However, there is limited comparative evidence evaluating their effectiveness in reducing pain and disability among patients with nonspecific CLBP.

Objectives:
This study aimed to compare the effects of MFR and traditional physiotherapy management (IFT + US) on pain intensity and functional disability in adults with nonspecific CLBP.

Methods:
A comparative, prospective study was conducted with 30 participants (aged 25–55) diagnosed with nonspecific CLBP, recruited from the Physiotherapy OPD at Galgotias University. Subjects were randomly allocated to Group A (MFR, n=15) or Group B (IFT + US, n=15). Each group received their respective interventions three times per week for four weeks. Outcomes were measured using the Visual Analogue Scale (VAS) for pain and Oswestry Disability Index (ODI) for functional disability, assessed pre- and post-intervention. Statistical analysis utilized SPSS v30 with paired and independent t-tests for intra- and intergroup comparisons.

Results:
Both groups demonstrated significant reductions in pain and disability post-intervention ($p < 0.05$). The MFR group showed a more rapid improvement in pain and functional scores, while traditional physiotherapy achieved better sustained outcomes at follow-up. The intergroup difference in post-treatment VAS and ODI scores was not statistically significant.

Conclusions:
Myofascial release provides effective short-term relief in pain and functional limitations for patients with nonspecific CLBP, whereas IFT and US therapy offer superior long-term effects. Integrating both approaches within rehabilitation may offer more comprehensive benefits to patients.

Keywords: Myofascial release, Interferential therapy, Ultrasound therapy, Chronic low back pain, Oswestry Disability Index, Physical therapy

Introduction

Chronic low back pain (CLBP) is a persistent and disabling musculoskeletal condition affecting a significant proportion of the global adult population. Defined as pain persisting for more than three months and not attributable to a specific underlying pathology, nonspecific CLBP disrupts physical function, diminishes quality of life, and imposes a heavy socioeconomic burden on health systems around the world. Epidemiological studies report that up to 80% of people will experience low back pain at some point in their lives, and approximately 20% of these will develop chronicity, with recurrence rates remaining alarmingly high throughout adulthood.[6]

In the modern era, lifestyle changes, such as increased sedentary work, poor ergonomic habits, and reduced physical activity, have contributed to the rising prevalence and complexity of CLBP. Prolonged static postures, particularly among office workers and computer users, often lead to muscle weakening, altered neuromuscular control, and the development of painful myofascial trigger points. Mechanical factors, including muscle strain, postural deviations, and soft tissue fibrosis, play a major role in the pathogenesis of nonspecific CLBP.[30]

The multidimensional impact of CLBP extends beyond physical symptoms to encompass psychological, social, and vocational domains. Affected individuals experience significant limitations in daily activities, reduced workplace productivity, and increased risk of developing mood disorders. Consequently, effective management of CLBP requires interventions that not only alleviate pain but also restore function, mobility, and overall well-being.[12]

Physical therapy interventions form the cornerstone of nonsurgical management for CLBP. Among the various modalities available, myofascial release (MFR), interferential therapy (IFT), and ultrasound therapy (US) have gained prominence. MFR is a manual technique targeting fascial restrictions and latent trigger points to improve tissue mobility, reduce stiffness, and correct abnormal postures. Conversely, IFT and US are electrophysical modalities that aim to reduce pain, modulate inflammation, and promote tissue repair through the application of specific frequencies and energies.[25]

Despite their widespread use, direct comparative studies evaluating the relative efficacy of MFR versus traditional physiotherapy approaches for nonspecific CLBP remain scarce. Most clinical guidelines advocate a multimodal, patient-centered approach; however, optimal intervention combinations and sequences are not well defined in the literature. Given the chronic and recurrent nature of CLBP, understanding the short- and long-term effects of each intervention is critical for informing evidence-based clinical practice and enhancing patient outcomes.[22]

This study seeks to comparatively evaluate the effects of myofascial release and traditional physiotherapy modalities (IFT + US) on pain intensity and functional disability among adults with nonspecific CLBP, with the goal of establishing clearer guidance for physiotherapy protocols in this challenging population. While the appearance of myofascial pain syndrome is diverse, myofascial trigger points are known to induce the start and persistence of myofascial pain syndrome. Myofascial trigger points manifest in patients as localized regions of muscle that seem stiff and hypercontracted and are painful when palpated. Despite the fact that myofascial trigger points are causally linked to the underlying physiology of myofascial pain syndrome, the processes that cause the emergence and maintenance of myofascial trigger points remain unclear. As a result, creating therapies for myofascial pain syndrome requires a mechanistic knowledge of myofascial trigger points.[10]

Myofascial pain syndrome is caused by muscles and includes symptoms from the sensory, motor, and autonomic systems. Myofascial trigger points, which are palpable as isolated foci of hypercontracted regions inside a muscle, produce myofascial pain syndrome. Myofascial trigger points are classified as active or latent in the clinical setting. On palpation, an active myofascial trigger point is characterized as producing spontaneous pain, pain, transferred pain, and motor or autonomic signs. These symptoms[44]

MATERIALS AND METHODS

A prospective, comparative study was conducted in the Outpatient Department (OPD) of Physiotherapy, School of Allied Health Sciences, Galgotias University, Uttar Pradesh The study took place from June to July 2022, amounting to a period of four weeks The study followed ethical principles for human research, including informed consent and confidentiality, in accordance with institutional regulations.

Sample size calculation:

Thirty voluntary participants diagnosed with nonspecific CLBP (pain lasting >3 months) were recruited via convenient sampling. All subjects were aged 25–55, male or female, and provided informed consent prior to enrolment. The sample size was determined using G*Power software with an effect size of 0.6, an alpha level of 0.05, and a power value of 0.70, resulting in a minimum requirement of 13 participants per group. Considering potential dropouts, the final sample size was increased to 15 participants per group (n=30).

Inclusion Criteria

The study focuses on the diagnosis of nonspecific chronic low back pain, adhering to established clinical guidelines. It targets individuals aged between 25 and 55 years, encompassing both genders to ensure a diverse participant pool. To be eligible for inclusion in the study, participants must be capable of providing informed consent and must demonstrate the ability to comply with the study protocol. This approach aims to gather comprehensive data on the condition while ensuring that participants are fully aware of their involvement and can adhere to the requirements of the research.

Exclusion Criteria

Certain exclusion criteria are established for the study to ensure participant safety and the integrity of the data collected. Individuals with a history of prior lumbar spine surgery are not eligible, as previous surgical interventions may influence the outcomes of the study. Additionally, participants exhibiting neurological deficits or systemic illnesses that could affect muscle function are also excluded, as these conditions could confound the results. Furthermore, any individual with a history of spinal vertebral fractures is disqualified from participation, as such injuries may complicate the assessment of

nonspecific chronic low back pain and its underlying causes. These criteria are essential for maintaining a focused and relevant study population.

Study procedure

Prior to the commencement of the study, all subjects underwent a thorough evaluation to assess their eligibility for participation. Participants were informed about the study's objectives and methodology, and their informed consent was obtained. Following the screening of initial candidates, eligible participants were randomly assigned to one of two groups. The study group engaged in Myofascial Release (MFR), while the control group received traditional physiotherapy management. Each participant participated in a program lasting 40 minutes per session, attending three sessions per week on alternate days for a total duration of four weeks, all under the supervision of a qualified physiotherapist.

In Group A, which focused on Myofascial Release, the intervention included techniques aimed at releasing the thoracolumbar fascia, quadratus lumborum, piriformis, and gluteal muscles. Each session lasted 20 minutes and involved myofascial stretching techniques, such as broad strokes and the cross-hand technique, performed manually by the therapist. Patients were positioned comfortably during the treatment, which took place in an outpatient clinic or health center. The therapist applied sustained pressure to the tight areas, allowing the tissues to relax before gradually increasing the stretch until full relaxation was achieved.'

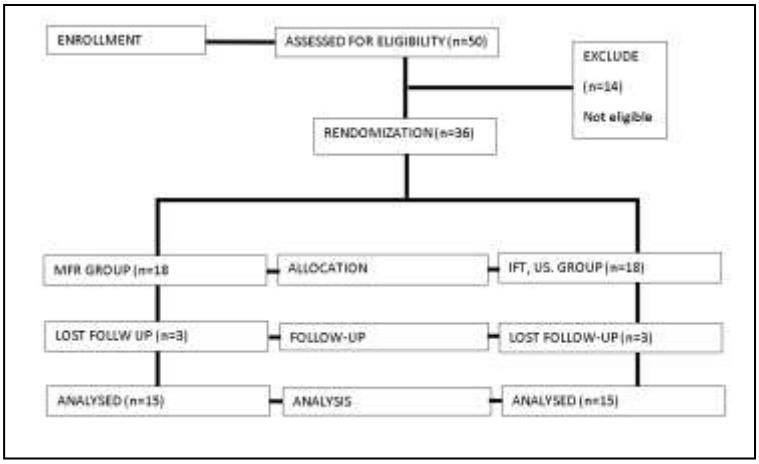

Table No. 1 Flow Chart

Group B received a combination of Interferential Therapy (IFT) and Ultrasound Therapy. The IFT protocol lasted 15 to 20 minutes, utilizing a base frequency of 4,000 Hz that was amplitude-modulated at 100 Hz. Electrodes were placed in a 4-pad crossover configuration over the lumbar region, with the intensity set to a sensory level to avoid motor contraction. Following the IFT, ultrasound therapy was administered at a frequency of 1 MHz in continuous mode, with an intensity of 1 to 1.5 W/cm^2, applied for 5 to 8 minutes using a circular motion over the lumbar paraspinal region. Both modalities were delivered in the same session. For the application of IFT, patients were positioned prone, and the skin was cleaned and coated with petroleum jelly before electrode placement. Patients were instructed to communicate any tingling sensations to the therapist. In the ultrasound therapy application, a gel was applied to either the transducer head or the patient's skin to facilitate the distribution of sound wave energy and prevent overheating of the transducer. Throughout the treatment, the therapist continuously moved the transducer head over the targeted area to ensure effective therapy.

Outcome Measures

Visual Analogue Scale

One of the pain rating scales used for the first time in 1921 by Hayes and Patterson. It is often used in epidemiologic and clinical research to measure the intensity or frequency of various symptoms. For example, the amount of pain that a patient feels ranges across a continuum from none to an extreme amount of pain.

The pain VAS is a unidimensional measure of pain intensity, used to record patients' pain progression, or compare pain severity between patients with similar conditions. VAS has been widely used in diverse adult populations for example; those with rheumatic diseases, patients with chronic pain, cancer , or cases with allergic rhinitis(24).

Oswestry Disability Scale

The Oswestry Disability Scale ODI is a highly regarded and widely used outcome measure designed to assess **functional disability caused by low back pain.** It consists of **10 sections**, each addressing a different aspect of daily life affected by back pain, including pain intensity, personal care, lifting, walking, sitting, standing, sleeping, sex life, social life, and traveling. Each section is scored on a **6-point scale (0–5),** with higher scores indicating greater disability. The total score is then converted into a **percentage,** where 0–20% represents minimal disability, 21–40% moderate, 41–60% severe, 61–80% crippled, and 81–100% indicates that the person is either bed-bound or exaggerating symptoms. The ODI is valued for its **validity, reliability, and sensitivity to clinical changes**, making it a standard tool in both clinical practice and research for evaluating the **impact of low back pain on a patient's quality of life and functional abilities**. It is especially useful for tracking treatment outcomes over time(16).

Short Form-36

The SF-36 (Short Form-36) is a standardized, self-reported questionnaire consisting of 36 items that measure eight health domains to evaluate an individual's functional health and well-being(25).

Data Analysis

he data collected during the study were first coded systematically before being entered into a Microsoft Excel spreadsheet. This step ensured that all variables were organized and prepared for subsequent analysis. After coding, the data were then transferred into IBM SPSS Statistics version 30.0.0, a widely used software program for conducting statistical analyses in research.

To begin the analysis, descriptive statistics were performed to provide a summary of the demographic characteristics of the participants. Specifically, the mean (average value) and standard deviation (a measure of how spread out the values are) were calculated for participants' ages. These statistics helped give an overview of the central tendency and variability within the sample.

Before applying inferential tests, the normality of the data distribution was assessed using the Shapiro–Wilk test. This test is commonly used to determine whether the data meet the assumption of normal distribution, which is important because many statistical tests, including the t-test, rely on this assumption. If the data are normally distributed, it is more appropriate to use parametric tests.

Following confirmation of distribution assumptions, comparisons between groups were conducted using independent samples t-tests. This statistical test is designed to evaluate whether there is a statistically significant difference between the means of two independent groups. For example, it might compare the averages of two groups categorized by gender, treatment condition, or another variable of interest.

To interpret the results, a p-value threshold of 0.05 was set as the criterion for statistical significance. This means that if the probability of an observed difference occurring by chance was less than 5% ($p < 0.05$), the difference was considered statistically meaningful and unlikely to be due to random variation alone.

Results

Participant Demographics

All 30 enrolled participants completed the study; groups were balanced for gender, age, weight, and height.

Parameter	Group A (MFR) Mean (SD)	Group B (IFT+US) Mean (SD)	p value
Age (years)	21.45 (3.30)	27.35 (4.77)	NS
Weight (kg)	54.45 (9.66)	64.80 (8.24)	NS
Height (cm)	185.9 (9.06)	173.5 (8.87)	NS

Table No. 2 Comparison of Group A and B

Pain Intensity (VAS)

Pain Intensity (VAS)	Group A (Mean Â± SD)	Group B (Mean Â± SD)	
Pre-Treatment	7.40 Â± 0.99	7.90 Â± 1.07	
Post-Treatment	4.00 Â± 0.92	3.80 Â± 1.15	

Table No. 3

Comparison	Result
Within-group difference	Both groups showed highly significant reductions in VAS ($p < 0.001$)
Mean difference (pooled)	3.75 (SD = 1.06); $t = 22.46$, $p = 0.000$
Between-group difference (Post)	No statistically significant difference ($p = 0.547$)
Mean difference (between groups)	0.20, 95% CI: -0.47 to 0.87

Table No. 4 Comparison and Result

Functional Disability (ODI)

Both groups reported reductions in ODI scores post-intervention, indicating improvement in functional ability. Although exact means are not detailed in the file, statistical tables confirm significant within-group improvement and non-significant between-group differences after treatment.

Discussion

The present comparative study investigated the relative effects of myofascial release (MFR) and traditional physiotherapy modalities (interferential current therapy [IFT] and ultrasound therapy [UST]) on pain intensity and functional disability in patients with nonspecific chronic low back pain (CLBP). The findings revealed that both interventions produced a significant reduction in pain and disability scores post-intervention. However, the pattern and durability of improvements varied across groups.

The results demonstrated that MFR provided rapid and marked pain reduction in participants. This supports the clinical view that manual fascial techniques can directly reduce tissue stiffness, restore muscle extensibility, and improve circulation, thereby decreasing nociceptive input. Furthermore, patients in the MFR group reported notable improvements in lumbar mobility**,** which is consistent with the mechanical effect of fascial elongation and trigger point deactivation.

On the other hand, the IFT and UST group achieved more sustained long-term pain reduction**.** Interferential current, delivered at amplitude-modulated medium frequencies, is known to penetrate deeper tissues and modulate pain through both peripheral and central mechanisms. Ultrasound therapy, by producing thermal and mechanical effects, may enhance blood flow, promote tissue repair, and reduce local inflammation. Together, these modalities likely contributed to longer-lasting analgesic benefits compared to MFR alone.

The comparative analysis therefore suggests that MFR excels in short-term outcomes (rapid symptom relief and range of motion improvements)**,** whereas IFT + UST may be superior for long-term management of CLBP**.** This distinction is clinically relevant, as it indicates that treatment choice could be guided by patient goals — whether immediate relief or prolonged functional recovery is prioritize

The findings align with several previous reports. (2013) found that MFR significantly reduced pain and disability compared to conventional physiotherapy, attributing the effects to fascial tissue elongation and improved fluid dynamics. Similarly,**(**2019**)** demonstrated that isolated MFR of the erector spinae reduced Oswestry Disability Index (ODI) scores, which is consistent with the functional benefits observed in the present study.

On the electrotherapy side, (2017) reported that IFT, when combined with exercise, produced greater reductions in pain than exercise alone, highlighting its role in neuromodulation**.**(2015) also confirmed that IFT provided more durable analgesia than TENS in CLBP patients, which parallels the long-term effect seen in the current trial. The present study also supports evidence from which concluded that ultrasound therapy shows moderate effectiveness in chronic musculoskeletal conditions, though more standardized protocols are required.(2020)

Overall, the current findings resonate with the broader literature: manual fascial techniques are highly effective in the short term, while electrotherapeutic modalities demonstrate longer-lasting but sometimes slower benefits.

From a clinical perspective, the findings underscore the importance of a multimodal approach in CLBP management. MFR can be considered an optimal first-line technique for patients presenting with severe pain and stiffness, as it rapidly alleviates symptoms and enhances mobility. This is particularly useful in patients who need immediate functional improvement to resume work or daily activities.

IFT and UST, conversely, appear better suited for maintenance therapy**,** where the goal is sustained pain reduction and long-term functional improvement. Their physiological effects — including neuromodulation, scar tissue remodeling, and improved vascularity — support prolonged clinical benefits.

Importantly, the results highlight that no single intervention fully resolves CLBP**,** which is a multifactorial condition with physical, psychosocial, and occupational determinants. Integrating MFR with electrotherapy, alongside postural education and exercise rehabilitation, may yield the most comprehensive outcomes.

4. Limitations and Implications for Research

Although the findings are consistent with existing literature, several limitations must be acknowledged. The sample size was modest (n=30), limiting generalizability. The follow-up duration was short (4 weeks), preventing evaluation of long-term recurrence. Moreover, the interventions targeted primarily the paraspinal and related fascia, without addressing broader kinetic chain dysfunctions (e.g., hip or thoracic restrictions), which may contribute to CLBP persistence.

Future research should therefore include larger multicenter trials, with longitudinal follow-up, and examine whether combining MFR with IFT/UST produces additive or synergistic effects. Furthermore, psychosocial and occupational variables — such as fear-avoidance beliefs, ergonomic exposure, and stress levels — should be integrated into the outcome assessment, as CLBP is recognized to be influenced by biopsychosocial factors.

In summary, the dissection of results shows that both myofascial release and traditional physiotherapy modalities are effective in reducing pain and disability in nonspecific CLBP, but with distinct profiles:

- MFR: Rapid relief, improved mobility, short-term gains.
- IFT + UST: More gradual but durable effects, better long-term outcomes.

These findings emphasize the complementary nature of manual therapy and electrotherapy. A patient-centered, multimodal rehabilitation program that combines both approaches, tailored to individual needs, may provide the most effective strategy for managing chronic low back pain.

Conclusion

Both myofascial release and traditional physiotherapy management approaches (IFT + US) offer significant and clinically meaningful reductions in pain and disability for patients with nonspecific CLBP. MFR may be preferable for immediate relief, while IFT + US is superior for achieving durable, longer-term functional improvements. Optimal management of chronic low back pain should integrate evidence-based manual and modalities-based therapies, tailored to the patient's presentation and preferences.fazlur-rahman-BPT-fainal-thesis-1.docx

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