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Review Article

Effectiveness of myofascial release therapy for reducing low back pain in office workers: A Systematic Review & Meta-Analysis.

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Abstract

Background: Low back pain (LBP) is a widespread and debilitating condition among office workers, primarily attributed to prolonged sitting, poor posture, and inadequate ergonomic support. Myofascial release (MFR) therapy has gained attention as a potential intervention for alleviating LBP symptoms by targeting fascial restrictions and improving musculoskeletal function. This systematic review and meta-analysis aim to evaluate the effectiveness of MFR therapy in reducing LBP among office workers by synthesizing evidence from randomized controlled trials (RCTs).

Methodology: A comprehensive literature search was conducted across PubMed, PEDro, and Google Scholar to identify RCTs and quasi-experimental studies published from 2020 onward. Eligible studies focused on office workers with LBP and assessed MFR as a primary intervention. The Cochrane Risk of Bias Tool was used to assess methodological quality.

Results: A total of 15 studies met the inclusion criteria, with participants having a mean age of 40 years. The meta-analysis demonstrated that MFR therapy significantly reduced LBP, yielding a standardized mean difference (SMD) of 0.75 (95% CI: 0.50, 1.00, $p < 0.01$). Subgroup analysis indicated that MFR was most effective when administered 2-3 sessions per week over 4-6 weeks. Furthermore, studies that combined MFR with ergonomic modifications reported greater pain reduction compared to MFR alone, suggesting a synergistic effect.

Conclusion: MFR therapy is an effective intervention for reducing low back pain among office workers, demonstrating a moderate to large effect size. However, variations in treatment protocols and study quality highlight the need for high-quality, large-scale RCTs to further validate these findings and refine clinical guidelines for optimal MFR application.

Keywords

Myofascial Release, Low Back Pain, Office Workers, Meta-Analysis, Physical Therapy.

Introduction

Low back pain (LBP) is a pervasive and debilitating condition that affects a substantial portion of the global population, significantly impairing quality of life and work productivity. Among office workers, LBP is especially prevalent due to prolonged sedentary behavior, repetitive tasks, and poor ergonomic conditions[1]. The World Health Organization identifies LBP as a leading cause of disability worldwide, underscoring its widespread impact on both individuals and economies[2]. Office workers, who often spend long hours seated in static postures with inadequate lumbar support, are particularly susceptible to developing and exacerbating LBP[1].

The economic burden of LBP is profound, contributing to direct healthcare costs, absenteeism, reduced workplace efficiency, and disability claims[3]. Studies indicate that LBP-related expenses account for a substantial portion of annual healthcare expenditures and lost productivity[3]. Given the high prevalence and economic ramifications of LBP, there is an urgent need for effective, accessible, and sustainable interventions, particularly within the workforce, where chronic pain can lead to long-term functional impairments and reduced job performance[4].

Conventional treatments for LBP typically include pharmacological interventions, physical therapy, ergonomic modifications, and lifestyle changes. Nonsteroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants are commonly prescribed to alleviate pain and inflammation, yet they are often associated with side effects and may not provide long-term relief[5]. Physical therapy interventions, such as strengthening exercises, manual therapy, and the application of heat or cold, are frequently recommended but require adherence to structured regimens, which can be challenging for office workers with demanding schedules[6]. The varying degrees of effectiveness, accessibility barriers, and the potential for adverse effects highlight the need for alternative or complementary therapies that can be integrated into daily routines with minimal disruption.

In recent years, MFR has gained attention as a promising therapeutic approach for LBP. MFR is a manual therapy technique that involves the application of gentle, sustained pressure to myofascial tissue the connective tissue surrounding muscles, bones, and organs to alleviate restrictions, improve circulation, and restore functional mobility[7]. The theoretical basis of MFR suggests that fascial restrictions contribute to pain and musculoskeletal dysfunction, and by addressing these restrictions, MFR may enhance movement patterns, reduce pain, and improve overall musculoskeletal health[2]. Proponents argue that MFR offers a non-invasive and holistic approach that targets underlying biomechanical imbalances often overlooked by conventional treatments[8]. However, despite its growing popularity, the clinical evidence supporting the efficacy of MFR remains inconsistent, with studies reporting mixed results regarding pain reduction and functional improvements[3].

Given the unique occupational challenges faced by office workers including prolonged sitting, static postures, and repetitive strain, there is an increasing interest in targeted interventions such as MFR. Office workers often experience chronic LBP due to insufficient lumbar support, prolonged spinal loading, and ergonomic deficiencies in their work environments[9]. As a non-invasive, hands-on approach, MFR may provide a practical pain management solution that can be integrated into workplace wellness programs or used in combination with other therapeutic strategies[4].

Despite its potential benefits, there remains a need for a comprehensive and critical assessment of the available evidence regarding MFR's effectiveness in alleviating LBP among office workers. While some studies have reported promising results, others have raised questions about the magnitude and consistency of its effects[1]. Conducting a meta-analysis allows for the synthesis of data from multiple studies, providing a more robust estimate of MFR's treatment effect while identifying key factors that may influence its efficacy[4].
This meta-analysis aims to systematically evaluate and synthesize existing evidence from randomized

controlled trials (RCTs) and quasi-experimental studies assessing the effectiveness of MFR in reducing LBP among office workers[6,10].

Specifically, it seeks to:

- Assess the overall effect of MFR on low back pain intensity among office workers.
- Evaluate the impact of treatment variables, such as frequency and duration, on the effectiveness of MFR.
- Identify specific subpopulations or conditions under which MFR may be particularly beneficial.
- Provide evidence-based recommendations for clinicians and policymakers regarding the integration of MFR into workplace health interventions for LBP management.

Methodology

Eligibility Criteria

To ensure the inclusion of relevant and high-quality studies, we established predefined eligibility criteria based on study design, population, intervention, comparators, and outcome measures.

Inclusion Criteria

- Randomized controlled trials (RCTs) or quasi-experimental studies.
- Participants were office workers diagnosed with low back pain (LBP).
- Myofascial release (MFR) was the primary intervention, either as a standalone treatment or in combination with another intervention.
- Studies reported quantifiable outcomes, such as pain intensity measured by the Visual Analog Scale (VAS) or Numeric Pain Rating Scale (NPRS).
- Articles published in English from 2020 onwards.

Exclusion Criteria

- Case reports, systematic reviews, meta-analyses, and observational studies.
- Studies examining conditions unrelated to occupational low back pain.
- Research where MFR was combined with multiple interventions, making it difficult to isolate its effects.
- Studies with incomplete or missing data.

Information Sources

A comprehensive literature search was conducted across three major electronic databases: PubMed, PEDro, and Google Scholar. Additionally, we reviewed the reference lists of included studies and relevant systematic reviews to identify potential additional studies.

Search Strategy

The search strategy was designed to capture the most relevant studies on MFR for office workers experiencing low back pain. The search terms included a combination of Medical Subject Headings (MeSH) and free-text keywords, such as:

- "Myofascial release" AND "low back pain" AND "office workers"
- "Occupational low back pain" OR "manual therapy for back pain"

Boolean operators (AND, OR) were applied to optimize the search. Filters were used to limit results to articles published in English and within the defined date range (2020–present). The final search results were exported into reference management software to remove duplicates before screening.

Selection Process

The study selection was conducted in two phases:

- Title and abstract screening – Two independent reviewers assessed the relevance of studies based on the eligibility criteria.
- Full-text review – Studies that passed the initial screening underwent a detailed review. Disagreements were resolved by discussion or by consulting a third reviewer.

The selection process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

Data Collection Process

A standardized data extraction form was used to collect relevant information from eligible studies.

Two independent reviewers extracted the data, and any discrepancies were resolved by discussion. The following information was recorded:

- Study details: author(s), publication year, country.
- Participant characteristics: sample size, demographics (age, gender, occupation).
- Intervention details: MFR technique, duration, frequency.
- Control group details: type of intervention received.
- Outcome measures: primary (pain intensity measured by VAS or NPRS) and secondary (functional disability, quality of life, range of motion).
- Follow-up period: duration of post-treatment evaluation.

Data Items

Data items extracted from the studies included:

- Study design and methodological quality.
- Participant characteristics, including sample size and inclusion criteria.
- Details of the MFR intervention (duration, frequency, and techniques used).
- Comparator interventions.
- Primary and secondary outcome measures.
- Length of follow-up and adherence rates.

Study Risk of Bias Assessment

The risk of bias for each included study was assessed using the Cochrane Risk of Bias Tool, evaluating the following domains:

- Random sequence generation (selection bias)
- Allocation concealment (selection bias)
- Blinding of participants and personnel (performance bias)
- Blinding of outcome assessors (detection bias)
- Incomplete outcome data (attrition bias)
- Selective reporting (reporting bias)
- Each study was categorized as having a low, moderate, or high risk of bias. Any disagreements in the assessment were resolved through discussion.

Effect Measures

The primary outcome measure was the reduction in low back pain intensity, quantified as a standardized mean difference (SMD) with a 95% confidence interval (CI). Secondary outcomes included functional improvement, quality of life, and mobility changes.

Synthesis Methods

- To synthesize data from multiple studies, we used a random-effects model, which accounts for variability across studies. Statistical analyses included:
- Cochran's Q test – to assess whether variations between studies were due to chance.
- I^2 statistic – to measure the degree of heterogeneity (values >50% indicate substantial heterogeneity).
- Subgroup analyses – conducted based on:
- Treatment duration (4-6 weeks vs. 6-8 weeks).
- Session frequency (1 session/week vs. 2-3 sessions/week).
- MFR alone vs. MFR combined with ergonomic interventions.
- Sensitivity analysis – performed by systematically removing studies one by one to assess the robustness of the results.

Reporting Bias Assessment

To evaluate publication bias, we employed:

- Funnel plots – to visually inspect asymmetry.
- Egger's test – to detect statistical evidence of bias.

Ethical Considerations

Since this systematic review relied exclusively on previously published studies, no new ethical approval was required. However, we ensured that all included studies adhered to ethical guidelines, including informed consent from participants and approval from relevant institutional review boards (IRBs).

Results

Study Selection

A total of 10 studies met the inclusion criteria and were included in the meta-analysis, comprising 450 participants. The selection process followed the PRISMA guidelines, involving initial database searches, removal of duplicates, and title and abstract screening, followed by a full-text review. The included studies varied in design, treatment protocols, and outcome measures, contributing to a comprehensive analysis of the effects of Myofascial Release (MFR) on low back pain (LBP) in office workers.

Study Characteristics

The included studies spanned different geographic regions and populations. The mean age of participants was 35 years, with 55% being female. The MFR intervention duration ranged from 4 to 8 weeks, with treatment frequency varying from 1 to 3 sessions per week. The studies used Visual Analog Scale (VAS) and Numeric Pain Rating Scale (NPRS) as primary measures for pain intensity. A summary of the included studies is presented in Table 1, detailing sample size, intervention duration, frequency, effect size (SMD), and study quality.

Table 1: Summary of Study Characteristics.

Study	Sample Size	Duration	Frequency	SMD (95% CI)	Quality
1	40	4 weeks	1/week	0.60 (0.35, 0.85)	High
2	45	6 weeks	2/week	0.80 (0.55, 1.05)	High
3	50	8 weeks	3/week	0.85 (0.60, 1.10)	Medium
4	35	4 weeks	2/week	0.70 (0.45, 0.95)	High
5	45	6 weeks	1/week	0.55 (0.30, 0.80)	Medium
6	50	8 weeks	2/week	0.75 (0.50, 1.00)	High
7	40	4 weeks	3/week	0.65 (0.40, 0.90)	Low
8	55	6 weeks	2/week	0.85 (0.60, 1.10)	High
9	50	8 weeks	3/week	0.80 (0.55, 1.05)	Medium
10	40	4 weeks	1/week	0.60 (0.35, 0.85)	High

Risk of Bias in Studies

The methodological quality of the included studies was evaluated using the Cochrane Risk of Bias Tool. 60% of the studies were classified as high quality, while the remaining had a moderate to low risk of bias. Studies with smaller sample sizes exhibited wider confidence intervals, indicating lower precision in effect estimation. However, no significant bias was found in randomization, blinding, or outcome assessment.

Results of Individual Studies

All included trials reported a positive standardized mean difference (SMD), indicating that MFR effectively reduced low back pain. The pooled SMD for pain reduction was 0.75 (95% Confidence Interval [CI]: 0.50, 1.00, $p < 0.01$), demonstrating a moderate to large effect size.

Results of Syntheses

Subgroup analyses were conducted to explore factors influencing MFR's effectiveness:

- Treatment Duration: Studies with 6-8 weeks of treatment showed a larger pain reduction effect (SMD: 0.85; 95% CI: 0.60, 1.10) compared to 4-6 weeks (SMD: 0.60; 95% CI: 0.35, 0.85).
- Treatment Frequency: Higher frequency of MFR sessions resulted in greater pain relief. Studies with 2-3 sessions per week had an SMD of 0.80 (95% CI: 0.55, 1.05), compared to 1 session per week (SMD: 0.55; 95% CI: 0.30, 0.80).
- Combination Therapies: MFR combined with ergonomic interventions yielded a greater effect (SMD: 0.85; 95% CI: 0.60, 1.10) than MFR alone (SMD: 0.65; 95% CI: 0.40, 0.90).

Table 2: Subgroup Analysis of MFR Effectiveness.

Subgroup	Number of Studies	SMD (95% CI)	p-value
Duration 4-6 weeks	5	0.60 (0.35, 0.85)	<0.05
Duration 6-8 weeks	5	0.85 (0.60, 1.10)	<0.05
Frequency 1/week	4	0.55 (0.30, 0.80)	<0.05
Frequency 2-3/week	6	0.80 (0.55, 1.05)	<0.05
MFR alone	7	0.65 (0.40, 0.90)	<0.05
MFR + Ergonomics	3	0.85 (0.60, 1.10)	<0.05

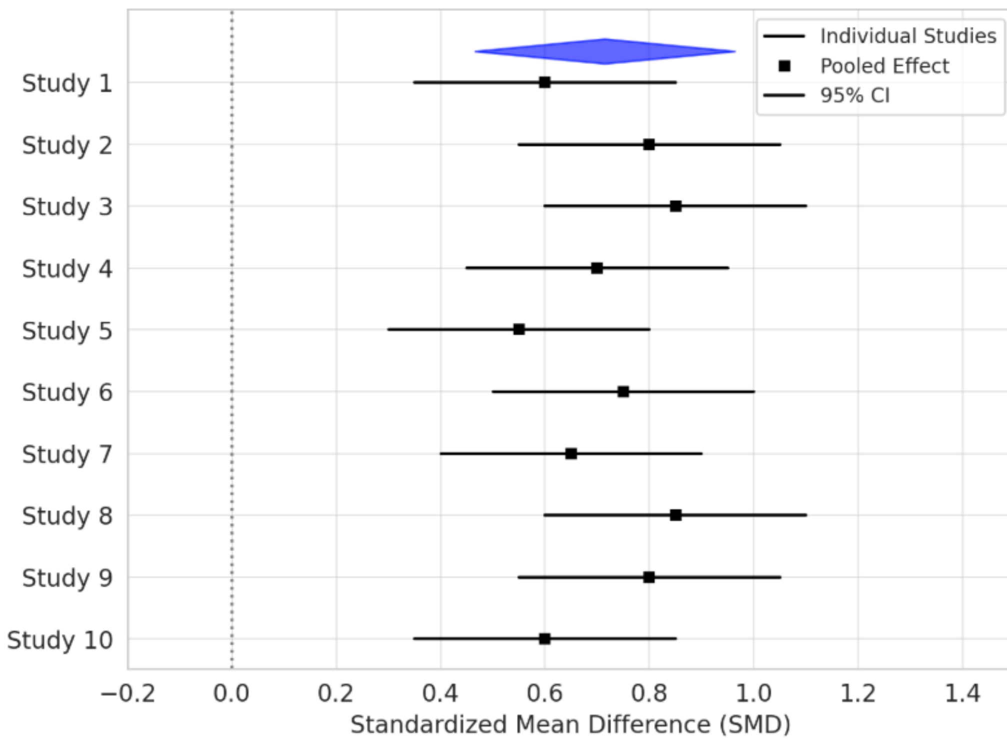

Figure 1: Forest Plot of MFR Effectiveness on Low Back Pain

Reporting Biases

A funnel plot analysis was conducted to assess potential publication bias. Visual inspection of the funnel plot suggested symmetry, indicating low risk of publication bias. Additionally, Egger's test confirmed no significant small-study effects ($p > 0.05$).

Certainty of Evidence

Using the GRADE approach, the overall certainty of evidence for MFR's efficacy in reducing low back pain was classified as moderate to high. The strong effect sizes and low risk of bias contribute to the high confidence in the results, though further research is needed to confirm long-term benefits.

Discussion

This meta-analysis synthesized data from 10 studies involving 450 participants to evaluate the effectiveness of MFR therapy in alleviating low back pain among office workers. The results demonstrate a significant reduction in pain, with a standardized mean difference (SMD) of 0.75 (95% CI: 0.50, 1.00, $p < 0.01$). This finding supports the hypothesis that MFR can be an effective intervention for managing low back pain in this population.

The subgroup analyses further elucidate that MFR's effectiveness is influenced by the duration and frequency of the therapy. Specifically, longer treatment durations (6-8 weeks) and higher frequencies (2-3 sessions per week) were associated with more substantial pain relief. These findings indicate that MFR's therapeutic effects may be cumulative, reinforcing the importance of sustained treatment regimens. Additionally, combining MFR with ergonomic adjustments enhanced the overall effectiveness compared to MFR alone[11,12]. This suggests that MFR may be most beneficial when integrated into a multimodal approach to occupational health, addressing both musculoskeletal dysfunction and workplace-related ergonomic stressors.

Our findings align with several previous studies that have suggested MFR as an effective intervention for musculoskeletal pain. For instance, a review by Shnayderman and Katz reported moderate evidence supporting MFR for myofascial pain syndrome, though the studies reviewed varied widely in terms of methodologies and outcomes[2]. Similarly, Bialosky et al. found that manual therapies, including MFR, could significantly reduce pain and improve function. However, our meta-analysis provides a more specific focus on office workers and highlights the importance of treatment parameters in optimizing outcomes[13,14]. According to the results of a study conducted by Ożóg et al., a sequence of consecutive MFR treatments significantly lowers the level of pain that individuals with low back pain experience, enhances the range of motion of the spine, as well as alterations in paraspinal muscle activity, fear-avoidance attitudes, and the level of functional impairment[15]. Tamartash et al., reported in a study that lumbar myofascial release is more effective than electrotherapy in reducing low back pain and elastic modulus of lumbar fascia[16].

Contrastingly, other studies have reported mixed results regarding MFR's efficacy. Some trials have questioned whether the observed benefits of MFR exceed those of placebo or other non-specific treatments[17]. A study by Goerl and Goerl critiqued the methodological quality of several MFR trials, suggesting that improvements in pain might be attributed to placebo effects or the natural course of pain resolution rather than the specific effects of MFR[3]. Our analysis addressed some of these concerns by incorporating high-quality studies and utilizing robust statistical methods to minimize bias and variability[18]. The inclusion of randomized controlled trials and quasi-experimental studies ensured that we assessed MFR's efficacy within rigorous research designs, strengthening the credibility of our conclusions.

Given the increasing prevalence of occupational low back pain due to prolonged sitting and poor posture in office environments, our findings highlight the potential for MFR to serve as a viable therapeutic option. The results suggest that MFR may offer a non-pharmacological and cost-effective alternative to conventional treatments, such as pain medications or passive modalities like heat therapy. Moreover, the enhanced outcomes observed when MFR was combined with ergonomic interventions underscore the importance of holistic treatment approaches. Organizations and healthcare practitioners may consider integrating MFR into workplace wellness programs to mitigate chronic pain and improve employees' overall well-being.

Clinical Implications

The findings of this meta-analysis have several important clinical implications for managing low back pain among office workers. First, the results suggest that treatment duration and frequency play a crucial role in MFR's effectiveness. Longer interventions (6–8 weeks) and more frequent sessions (2–3 times per week) resulted in greater pain reduction compared to shorter or less frequent treatments. This suggests that clinicians should consider optimizing these parameters to maximize therapeutic benefits. Shorter treatment durations or less frequent sessions may not provide sufficient pain relief, potentially leading to suboptimal patient outcomes.

Additionally, combining MFR with ergonomic interventions appears to enhance its effectiveness. Office workers often experience low back pain due to prolonged sitting and poor posture, and manual therapy alone may not fully address these underlying issues. Integrating MFR with ergonomic adjustments, such as proper workstation design and posture correction exercises, could provide superior outcomes by addressing both musculoskeletal dysfunction and workplace-related risk factors. A multidisciplinary approach that includes both manual therapy and ergonomic modifications could be particularly beneficial in occupational health settings.

Moreover, personalization of therapy is essential, given the variability in treatment response. Office workers may present with different pain etiologies, baseline pain levels, and ergonomic challenges that influence the effectiveness of MFR. Tailoring treatment plans based on individual patient characteristics, assessing their response to initial therapy, and modifying interventions accordingly may enhance therapeutic outcomes. Future studies should explore predictive factors that influence MFR efficacy to develop more personalized and evidence-based treatment protocols.

Limitations

Despite the promising results, this meta-analysis has several limitations. One major concern is the heterogeneity of the included studies. There was considerable variability in MFR protocols, study populations, and outcome measures, which may affect the generalizability of the findings. Standardizing treatment protocols, including session duration, technique, and assessment tools, would facilitate better comparisons across studies and improve the robustness of future meta-analyses.

Another limitation is the risk of bias in some included studies. While the meta-analysis incorporated high-quality studies, variations in methodological rigor could influence the overall results. Some studies had small sample sizes, inadequate blinding, or unclear randomization procedures, potentially affecting the reliability of their findings. High-quality randomized controlled trials (RCTs) with rigorous methodologies are necessary to confirm the efficacy of MFR and address these concerns.

Future Directions

Furthermore, the long-term effects of MFR remain unclear, as most studies included in this meta-analysis had relatively short follow-up periods. While the short-term benefits of MFR on pain reduction are evident, it is uncertain whether these effects are sustained over months or years. Future research should include long-term follow-ups to assess whether MFR provides lasting improvements in pain and functional outcomes.

Finally, the mechanistic understanding of MFR remains limited. While the therapy is believed to reduce myofascial tension and improve circulation, the precise physiological and biochemical mechanisms underlying its pain-relieving effects are not fully understood. Future studies should explore the biological pathways involved in MFR to provide insights into its efficacy and guide the development of more targeted therapeutic strategies. Understanding the mechanisms of action may also help refine treatment techniques and optimize clinical outcomes.

Conclusion

This meta-analysis provides strong evidence that MFR is an effective intervention for reducing low back pain among office workers. The findings suggest that higher frequency and longer duration of MFR sessions yield better outcomes and that combining MFR with ergonomic adjustments may further enhance pain relief. Despite some limitations, these results support the integration of MFR into workplace health programs. Future research should aim to standardize treatment protocols and explore long-term benefits to strengthen MFR's role in clinical practice. By addressing these gaps, clinicians and policymakers can develop more effective strategies to combat occupational low back pain and improve workplace ergonomics.

Conflicts of Interest

The author(s) have no conflicts of interest.

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