Evaluating the Role of Osteopathic Manipulative Treatment in Chronic Low Back Pain

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♦ Abstract

Chronic low back pain (CLBP) is one of the most common causes of disability and decreased quality of life in adult patients. Osteopathic manipulative treatment (OMT) is a potential nonpharmacological intervention that can provide significant reduction in pain intensity. Using a targeted PubMed search identifying three randomized controlled trials (Nguyen et al., 2021; Popovich et al., 2024; Licciardone et al., 2013), this meta-analysis evaluates the effectiveness of OMT in reducing pain intensity among patients suffering from subacute or chronic nonspecific low back pain. These studies report quantitative pain-intensity outcomes that involve adult patients aged 18-69 with nonspecific CLBP using OMT as the primary intervention while incorporating a sham or usual-care control group. Among the three studies, 397 patients received OMT while 776 received control interventions. Analysis amongst the studies using a qualify effects model demonstrated a statistically significant reduction in pain intensity with OMT intervention in comparison to control interventions (Standardized Mean Difference = −0.34; 95% CI: −0.62 to −0.06; p = 0.018). The substantial heterogeneity (I^2 = 74.6%) demonstrates a variety of intervention protocols, number of treatments, and measured outcomes. Overall, the findings of this meta-analysis support OMT as a clinically meaningful nonpharmacological intervention for CLBP but further trials are needed to optimize the proper standard of care guidelines.

♦ Introduction

Low back pain is one of the most common reasons adults seek medical care and is a major contributor to reduced quality of life and functional limitation. Many patients continue to experience symptoms despite standard conservative treatments, which has increased interest in nonpharmacologic and hands-on approaches to care. Osteopathic manipulative treatment (OMT) is frequently used to address somatic dysfunction and improve musculoskeletal function. Recent research has examined OMT as a therapeutic option for chronic low back pain, focusing on its potential to address somatic dysfunction and improve musculoskeletal function. These studies highlight key questions about effectiveness, mechanisms, and real world integration of OMT into multidisciplinary care, underscoring the need for continued investigation to clarify its role in evidence based back pain management (Licciardone et al., 2013; Weerasekera et al., 2022; Nguyen et al., 2021). Collectively, these studies demonstrate a growing interest in better defining the role of OMT as a noninvasive treatment option for patients with low back pain. Understanding its potential impact on pain and function may support more personalized and comprehensive approaches to musculoskeletal health.

♦ Question

Does OMT significantly reduce pain intensity and improve functional disability in adults with chronic low back pain compared to usual care or sham treatment?

♦ Hypothesis

Adults with chronic low back pain who receive a course of OMT will report greater reductions in pain intensity and greater improvements in disability (functional outcomes) over 4 - 6 weeks than those receiving usual care or sham manipulative treatment.

♦ Methods & Materials

A focused literature search using PubMed identified randomized control trials (RCTs) evaluating the effect of osteopathic manipulative treatment (OMT) on pain intensity in adults with subacute or chronic low back pain. Three eligible RCTs were found (Nguyen et al. (2021), Popovich et al. (2024), and Licciardone et al. (2013)) based on the following criteria: (1) adult participants with nonspecific low back pain, (2) OMT as the primary intervention compared with sham treatment or waiting-list control, (3) outcomes including patient-reported pain intensity, and (4) sufficient data to extract or calculate mean differences and standard deviations. Studies involving pediatric populations, non-RCT designs, or multimodal interventions without isolated OMT effects were excluded. For each study, sample sizes, group means, and standard deviations were extracted. Risk of bias was assessed using the RoB2 tool for RCTs, with domain-level judgments informing quality index (Qi) scores. Meta-analysis was conducted in Microsoft Excel, and a quality-effects model was applied to calculate pooled weighted mean differences (WMD) in pain intensity.

♦ Results

- Three randomized controlled trials met inclusion criteria, comprising **397** participants in OMT groups and **776** participants in sham or control groups.
- All studies included **adults with subacute or chronic nonspecific low back pain** and reported **pre- and post-intervention pain intensity** outcomes.
- Meta-analysis showed a **small but statistically significant reduction in pain intensity** with OMT compared with control.
- **Pooled effect**: Standardized Mean Differences (SMD) = **−0.34** (95% CI: **−0.62 to −0.06**, p = 0.018).
- **Heterogeneity**: I^2 = **74.6%**, indicating substantial variability across studies.

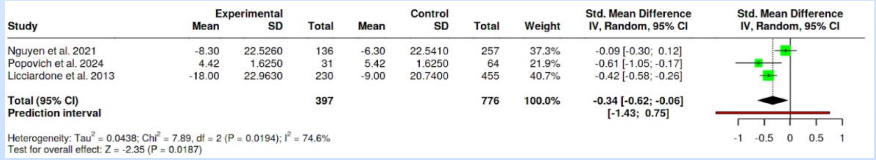

Figure 1. Forest plot of standardized mean differences (SMD) in pain intensity comparing osteopathic manipulative treatment (OMT) with control conditions across three randomized controlled trials (Nguyen et al., 2021; Popovich et al., 2024; Licciardone et al., 2013). Negative values indicate greater pain reduction with OMT. The pooled random-effects estimate showed a significant overall effect favoring OMT (SMD = −0.34; 95% CI, −0.62 to −0.06; p = 0.018) with substantial heterogeneity (I^2 = 74.6%).

♦ Discussion

The meta-analysis demonstrates that osteopathic manipulative treatment (OMT) provides a statistically significant reduction in pain intensity for adults with subacute or chronic nonspecific low back pain compared to control conditions. While the pooled effect size was modest (SMD = −0.34), it highlights the potential clinical relevance of OMT as a nonpharmacologic intervention. The substantial heterogeneity (I^2 = 74.6%) suggests variability in study populations, intervention protocols, and outcome assessments, indicating that individual patient responses may differ. These findings support integrating OMT as part of a multimodal approach to low back pain management, particularly for patients seeking non-drug therapies or those not fully responsive to conventional care. Future research should focus on standardizing treatment protocols and evaluating long-term outcomes to better understand the durability and mechanisms of OMT's effects.

♦ Conclusion

OMT is associated with a small but statistically significant reduction in pain intensity in adults with chronic or subacute low back pain. These results reinforce OMT as a viable nonpharmacologic treatment option that can complement conventional care. Given the observed heterogeneity, clinicians should consider patient-specific factors when recommending OMT, and further high-quality trials are warranted to optimize treatment strategies and evaluate long-term benefits.

♦ References

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