**Article Full Title**

Treatment effectiveness and fidelity of manual therapy to the knee: A systematic review and meta-analysis

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**Paper Abstract**

Manual therapy (MT) is a commonly used treatment for knee osteoarthritis (OA) but to date only one systematic review has explored its effectiveness. The purpose of the present study was to perform a systematic review and meta-analysis of the literature, to determine the effectiveness and fidelity of studies using MT techniques in individuals with knee OA. Relevant studies were assessed for inclusion. Effectiveness was measured using effect sizes, and methodological bias and treatment fidelity were both explored. Effect sizes were calculated using standardized mean differences (SMD) based on pooled data depending on statistical and clinical heterogeneity, as well as risk of bias. The search captured 2,969 studies; after screening, 12 were included. Four had a low risk of bias and high treatment fidelity. For self-reported function, comparing MT with no treatment resulted in a large effect size (standardized mean difference [SMD] 0.84), as did adding MT to a comparator treatment (SMD 0.78). A significant difference was found for pain when adding MT to a comparator treatment (SMD 0.73). The findings in the present meta-analytical review support the use of MT versus a number of different comparators for improvement in self-reported knee function. Lesser support is present for pain reduction, and no endorsement of functional performance can be made at this time.

**NIH Risk of Bias Tool**

Quality Assessment of Systematic Reviews and Meta-Analyses

1. **Is the review based on a focused question that is adequately formulated and described?**

Yes

1. **Were eligibility criteria for included and excluded studies predefined and specified?**

Yes

1. **Did the literature search strategy use a comprehensive, systematic approach?**

Yes

1. **Were titles, abstracts, and full-text articles dually and independently reviewed for inclusion and exclusion to minimize bias?**

Yes

1. **Was the quality of each included study rated independently by two or more reviewers using a standard method to appraise its internal validity?**

Yes

1. **Were the included studies listed along with important characteristics and results of each study?**

Yes

1. **Was publication bias assessed?**

Yes

1. **Was heterogeneity assessed? (This question applies only to meta-analyses.)**

Yes

**Key Finding #1**

Manual therapy appears moderately effective for improved function, specifically as an adjunct to another treatment and versus comparators of no treatment or other treatments

**Key Finding #2**

With some reservations, use of manual therapy is supported for pain

**Key Finding #3**

Based on the research findings, manual therapy cannot be supported as a mechanism to improve functional performance

**Key Finding #4**

**Please provide your summary of the paper**

This meta-analysis and systematic review looked at 12 studies about the use of manual therapy for patients with knee osteoarthritis. The researchers used PRISMA guidelines during the research process and created a list of inclusion to deem the study fit for review. They analyzed the literature bias using a modified version of the Downs and Black checklist and examined treatment fidelity, using a modified, unvalidated scale based on a scale from Borelli et al. (2005). Manual therapy was concluded effective and statistically significant with a moderate to large effect size when included with another treatment, versus no treatment, and versus other treatments. Although functional performance was not improved with manual therapy, manual therapy should be considered for use for patients with knee osteoarthritis to improve function and possibly relieve pain.

**Please provide your clinical interpretation of this paper. Include how this study may impact clinical practice and how the results can be implemented.**

Clinicians should consider using manual therapy for patients with knee osteoarthritis who want to gain more independence in function. Only two studies within the paper examined pain effects with manual therapy and the results were variable, so further research is needed to determine the effects of MT on pain relief for knee OA. More research should also be conducted to determine whether manual therapy can be effective in treating pain and improving function and functional performance in other knee pathologies.