**Article Full Title**

Effects of orthopaedic manual therapy in knee osteoarthritis: a systematic review and meta-analysis

**Author Names**

Anwer, S., Alghadir, A., Zafar, H., Brismée, J.M.

**Reviewer Name**

Shelby Dobratz, SPT

**Reviewer Affiliations**

Duke University School of Medicine, Doctor of Physical Therapy Division

**Paper Abstract**

Objective: This systematic review to aimed to evaluate the effects of orthopaedic manual therapy (OMT) on pain, improving function, and physical performance in patients with knee osteoarthritis (OA). Data sources: Four databases (PubMed, Web of Science, CENTRAL, and CINAHL) were searched. Study selection: Trials were required to compare OMT alone or OMT in combination with exercise therapy, with exercise therapy alone or control. Data extraction: Data extraction and risk assessment were done by two independent reviewers. Outcome measures were visual analogue scale (VAS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain score, WOMAC function score, WOMAC global score, and stairs ascending-descending time. Results: Eleven randomized controlled trials were included (494 subjects), four of which had a PEDro score of 6 or higher, indicating adequate quality. The results of the meta-analysis indicated that reduction of VAS score in OMT compared with the control group was statistically insignificant (SDM: -0.59; 95% CI: -1.54 to -0.36; P=0.224). The reduction of VAS score in OMT compared with exercise therapy group was statistically significant (SDM: -0.78; 95% CI: -1.42 to -0.17; P=0.013). The reduction of WOMAC pain score in OMT compared with the exercise therapy group was statistically significant (SDM: -0.79; 95% CI: -1.14 to -0.43; P=0.001). Similarly, the reduction of WOMAC function score in OMT compared with the exercise therapy group was statistically significant (SDM: -0.85; 95% CI: -1.20 to -0.50; P=0.001). However, the reduction of WOMAC global score in OMT compared with the exercise therapy group was statistically insignificant (SDM: -0.23; 95% CI: -0.54 to -0.09; P=0.164). The reduction of stairs ascending-descending time in OMT compared with the exercise therapy group was statistically significant (SDM: -0.88; 95% CI: -1.48 to -0.29; P=0.004). Conclusions: This review indicated OMT compared with exercise therapy alone provides short-term benefits in reducing pain, improving function, and physical performance in patients with knee OA.

**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?**

Cannot Determine, Not Reported, Not Applicable

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

Yes

**Key Finding #1**

This meta-analysis suggests that OMT interventions combined with exercise therapy, opposed to exercise therapy alone, provides positive benefits in the short-term to individuals with knee OA.

**Key Finding #2**

Positive benefits of OMT in this population include improved function, reduced pain, and decreased time ascending and descending stairs.

**Key Finding #3**

The decreased VAS score in knee OA subjects who received orthopaedic manual therapy was statistically significant, as was the WOMAC function score with OMT opposed to exercise therapy alone.

**Key Finding #4**

To improve evidence gathered from this study, more randomized controlled studies are warranted in addition to examining long-term effects.

**Please provide your summary of the paper**

This study examined the effects of orthopaedic manual therapy (OMT) in individuals with knee osteoarthritis. Only RCTs were included in this meta-analysis and eleven trials of 494 subjects were included in these analyses. Maitland joint mobilization was the greatest used OMT on these subjects, and manual therapy with exercise therapy was shown to improve function, reduce pain, and decrease time ascending and descending stairs. Furthermore, this review portrayed a moderate effect size of pain reduction with OMT opposed to the results of the exercise therapy group or control group. Researchers found that OMT is effective in individuals with knee OA by addressing the impaired joint kinematics, stimulating type II mechanoreceptors, inhibiting type IV nociceptors, enhancing Golgi tendon organ activity to allow relaxation, and reducing concentric muscle contraction, all to ease pain. However, to better understand the specific mechanism behind the positive results of manual therapy on knee OA, more research is warranted. A large limitation of this review was only three trials had long-term follow-up data; therefore the results were concluded to short-term benefits, and long-term research of OMT for knee OA is indicated. In addition, it would be beneficial to assess the difference between specific manual therapy techniques used, as this study could not make direct comparisons among the various manual therapy modalities.

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

This review helped to guide clinicians in the direction of performing orthopaedic manual therapy in conjunction with exercise therapy on patients with knee OA to positively influence their pain levels, increase their functional ability, and decrease time spent ascending and descending stairs. As this review was focused on the short-term influence of OMT, it was unable to show any long-term benefits, warranting additional research to gain insight on the long-term effectiveness of OMT in individuals with knee OA. If more research is found that also supports OMT in the long-term, this could greatly benefit clinicians in performing manual therapy on all clients with knee OA to achieve an increased quality of life through more specified therapy techniques demonstrated to provide relief.