**Article Full Title**

The Combination of Exercise and Manual Therapy Versus Exercise Alone in Total Knee Arthroplasty Rehabilitation: A Randomized Controlled Clinical Trial

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**Paper Abstract**

Total knee arthroplasty (TKA) is one of the most commonly performed orthopedic surgeries in the lower extremity. However, patient dissatisfaction and functional disability are mostly experienced because of pain and limited range of motion (ROM). Although manual therapy is commonly implemented to improve ROM and modulate pain in the management of musculoskeletal disorders, there is a lack of evidence about its clinical effectiveness on postoperative TKA rehabilitation.

**NIH Risk of Bias Tool**

Quality Assessment of Controlled Intervention Studies

1. **Was the study described as randomized, a randomized trial, a randomized clinical trial, or an RCT**

Yes

1. **Was the method of randomization adequate (i.e., use of randomly generated assignment)?**

Yes

1. **Was the treatment allocation concealed (so that assignments could not be predicted)?**

Yes

1. **Were study participants and providers blinded to treatment group assignment?**

Cannot Determine, Not Reported, or Not Applicable

1. **Were the people assessing the outcomes blinded to the participants' group assignments?**

Cannot Determine, Not Reported, or Not Applicable

1. **Were the groups similar at baseline on important characteristics that could affect outcomes (e.g., demographics, risk factors, co-morbid conditions)?**

Yes

1. **Was the overall drop-out rate from the study at endpoint 20% or lower of the number allocated to treatment?**

Yes

1. **Was the differential drop-out rate (between treatment groups) at endpoint 15 percentage points or lower?**

Yes

1. **Was there high adherence to the intervention protocols for each treatment group?**

Yes

1. **Were other interventions avoided or similar in the groups (e.g., similar background treatments)?**

Yes

1. **Were outcomes assessed using valid and reliable measures, implemented consistently across all study participants?**

Yes

1. **Did the authors report that the sample size was sufficiently large to be able to detect a difference in the main outcome between groups with at least 80% power?**

Yes

1. **Were outcomes reported or subgroups analyzed prespecified (i.e., identified before analyses were conducted)?**

No

1. **Were all randomized participants analyzed in the group to which they were originally assigned, i.e., did they use an intention-to-treat analysis?**

Cannot Determine, Not Reported, or Not Applicable

**Key Finding #1**

Joint and soft tissue mobilizations, with the addition to exercise therapy, are found to improve function, pain, and patient satisfaction versus just exercise programs alone for postoperative TKA patients.

**Key Finding #2**

Despite a between-group difference in knee flexion change score of 12.8° at 2 months, there were no group-by-time interactions significant for both flexion and extension ROMs.

**Key Finding #3**

When considering patient satisfaction, the mobilization group responded higher compared to the controlled group.

**Key Finding #4**

Outcome measurements were used along all participants such as numeric pain-rating scale, knee ROMs, Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score, 10-meter walk test (10MWT), 5-times sit to stand test (5SST), and Short Form-12 (SF-12).

**Please provide your summary of the paper**

Many tend to look manual therapy as the reward of the hard work. However, this Randomized Controlled Clinical Trial shows beneficial factors from manipulation after exercise program. The key strength of this clinical trial (low risk of bias) are the outcome measures reported by therapist and patient themselves. Although group-by-time did not show a significant change of flexion and extension ROM. This could indicate guarding or fear, however, reports on total WOMAC score, 10MWT, and SF-12 mental component summary showed meaningful stats in the mobilized group.

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

Patients who have an exercise program with additional manual therapy tend to have better outcome measures. Trials shows that patients ROM shows no significant change, however, this could be due to fear, guarding and simple if the measurement was taken before or after the session. In clinical practice, this could cause a placebo effect or long term manual therapy. It is common to use manual therapy to increase range of motion and modulate pain in the management of musculoskeletal disorders, but there is limited evidence that manual therapy can facilitate recovery after TKA surgery.