**Article Full Title**

The immediate effects of passive hip joint mobilization on hip abductor/external rotator muscle strength in patients with anterior knee pain and impaired hip function. A randomized, placebo-controlled crossover trial

**Author Names**

Pfluegler G, Borkovec M, Kasper J, McLean S.

**Reviewer Name**

Megan Hayden, SPT

**Reviewer Affiliations**

Duke University School of Medicine, Doctor of Physical Therapy Division

**Paper Abstract**

Background: Anterior knee pain (AKP) is often associated with persistent hip muscle weakness and facilitatory interventions may be beneficial for managing patients with AKP (pwAKP). Physiotherapists often employ passive oscillatory hip joint mobilizations to increase hip muscle function. However, there is little information about their effectiveness and the mechanisms of action involved. Objectives: To investigate the immediate effects of passive hip joint mobilization on eccentric hip abductor/external rotator muscle strength in pwAKP with impaired hip function. Design: A double-blinded, randomized, placebo-controlled crossover design. Method: Eighteen patients with AKP participated in two sessions of data collection with one week apart. They received passive hip joint mobilization or placebo mobilization in a randomized order. Eccentric hip muscle strength was measured immediately before and after each intervention using a portable hand-held dynamometer. Results: An ANCOVA with the sequence of treatment condition as the independent variable, the within-subject post-treatment differences as the dependent variable and the within- subject pre-treatment differences as the covariate was conducted. Patients showed a significant mean increase in eccentric hip muscle strength of 7.73% (p = 0.001) for the mobilization condition, compared to a mean decrease of 4.22% for the placebo condition. Seventeen out of eighteen participants reported having no pain during any of the strength testing. Conclusion: These data suggest that passive hip joint mobilization has an immediate positive effect on eccentric hip abductor/external rotator muscle strength in pwAKP with impaired hip function, even in the absence of current pain.

**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?**

No

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

Yes

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)?**

No

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)?**

Yes

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?**

Yes

**Key Finding #1**

Hip joint mobilizations demonstrated immediate improvements in gluteal strength for patients with AKP.

**Key Finding #2**

The study determined that grade 4 mobilizations showed immediate improvements in strength; the effects of grade 3 or 5 were not examined.

**Key Finding #3**

Outcomes were based on immediate effects only, not long-term effects.

**Please provide your summary of the paper**

This research study examined the overarching idea that treating neighboring joints is also important in a plan of care. Reduced hip strength can lead to malalignment of the entire lower extremity and lead to pain and structural damage, so this study was examining the effects of manual therapy at the hip level for those experiencing knee pain. Strength was measured first via the clam exercise outcome measure, followed by either grade 1 mobilizations (placebo group) or grade 4 (experimental). Finally, each patient’s strength was re-tested via the clam exercise to examine the immediate effects of the mobilizations on hip strength.

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

Overall, this study shows the immediate, positive effect of a grade 4 manipulation on hip strength in those with AKP. Due to the immediate effects of the treatment, it may be best utilized prior to engaging in therapeutic exercises to ensure adequate muscle fiber recruitment and enhance strength gains. The study does not include a comparison of therapeutic exercise to mobilizations, therefore it is necessary to consider other treatments in addition to manual therapy in the plan of care.