**Article Full Title**

The effectiveness of manual therapy in addition to passive stretching exercises in the treatment of patients with haemophilia knee arthropathy: A randomized, single-blind clinical trial.

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**Paper Abstract**

Haemophilic arthropathy is characterized by joint restrictions. One of the most affected joints in haemophilia patients is the knee. The aim of the study is to evaluate the effectiveness of manual therapy and passive muscle stretching exercises for reducing the frequency of hemarthrosis and pain and improving joint health and range of motion in patients with haemophilic knee arthropathy. Twenty eight patients with haemophilic knee arthropathy were randomized to an experimental group or to a control group (without intervention). Manual therapy sessions included joint traction and gliding manoeuvers, in addition to passive muscle stretching. The intervention included one 60-minute with two weekly sessions over a 12-week period. We evaluated the frequency of knee hemarthrosis (self-reporting), joint health (Hemophilia Joint Health Score), range of motion (goniometry) and perceived knee pain (visual analogue scale). A baseline evaluation was performed at the end of the intervention and after a 12-week follow-up period. The results showed that the frequency of hemarthrosis dropped significantly in the experimental group compared to the control group (F = 11.43; P &lt; .001). Compared to the control group, the experimental group had consistently better results in the variables for joint health (F = 13.80; P &lt; .001), range of motion in knee flexion (F = 24.29; P &lt; .001) and loss of extension (F = 8.90; P &lt; .001), and perceived pain (F = 49.73; P &lt; .001). In conclusion, manual therapy using joint traction and gliding manoeuvers, in addition to passive muscle stretching, reduces the frequency of hemarthrosis in patients with haemophilia. Manual therapy with passive muscle stretching exercises improves joint health, range of motion and perceived joint 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?**

Yes

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)?**

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?**

No

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**

At baseline, no differences were found between the study groups in any of the measured variables

**Key Finding #2**

Manual therapy using traction and joint sliding techniques showed significant improvements in the frequency of hemarthrosis, joint health, knee flexion and loss of extension, and perceived pain

**Key Finding #3**

Manual therapy was shown to maintain these improvements after six months of treatment

**Please provide your summary of the paper**

There is a high prevalence of haemophilic knee arthropathy in patients with haemophilia. Despite that, only a few studies looked into the efficacy of manual therapy applied to this condition. To fill this gap, this study evaluated the safety and effectiveness of manual therapy using traction and joint sliding techniques and passive muscle stretching in patients with haemophilic knee arthropathy. An experienced physical therapist was blinded to patient allocation to each study group and conducted all the evaluations, reducing bias. Further, no adverse events were reported during the study. One of the study’s major limitations is the low sample size. Additionally, the secondary study variables focused on assessing musculoskeletal outcomes, which are of great importance. However, other measures, such as functional independence and quality of life, were not investigated. Although the results showed support and improvement once manual therapy techniques were used, further randomized clinical trials with a larger sample size and measured outcomes would be necessary to validate these results.

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

From the results of this study, various manual therapy mobilization techniques, such as traction and joint sliding can be implemented in the treatment plan of patients with haemophilic knee arthropathy. The study provides a further understanding of how these techniques reduce the frequency of hemarthrosis as well as improve joint health in these patients. Further studies would be necessary to validate the results and allow for these exercises to be implemented on a regular basis.