**Article Full Title**

Effects of tibiofemoral mobilization in patients of Patellofemoral pain syndrome

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**Paper Abstract**

**Objective:** To determine the effects of tibiofemoral joint mobilisation on pain and range of motion in patients with patellofemoral pain syndrome.

**Methods:** The randomised control trial was conducted at the Lady Reading Hospital and Hayatabad Medical Complex, Peshawar, Pakistan, from July to December 2019, and comprised patellofemoral pain syndrome patients of either gender aged 25-35 years with anterior knee pain for at least one month. The subjects were randomly allocated control group A and experimental group B. Group A received 6 stretching and strengthening exercises of hip and knee muscles with hot pack, while group B additionally received tibiofemoral joint mobilisation. There were 3 sessions per week over 4 weeks for both the groups. Numeric pain rating scale, Kujala scale, algometer and goniometer were used to assess pain and range of motion at baseline and at the end of the last session. Data was analysed using SPSS 20.

**Results:** Of the 60 individuals initially assessed, 52(86.6%) were enrolled; 26(50%) in each of the two groups. The overall mean age of the sample was 29.63±3.25 years. The experimental group B showed significant improvement in pain, range of motion and pressure pain threshold (*p*<0.05) compared to the control group A. Group B also showed significant improvement in terms of functional activities (*p*<0.05). Except patellar instability and weight-bearing activities, the groups showed no significant difference (*p*>0.05).

**Conclusion:** Tibiofemoral joint mobilisations with hip and knee stretching and strengthening exercises were found to be more effective in reducing pain, and increasing range of motion as well as pressure pain threshold.

Clinical Trial Number: Identifier: **NCT04225000:https://clinicaltrials.gov/ct2/show/NCT04225000**

**Keywords:** Kujala anterior knee pain scale, Numerical pain rating scale, Patellofemoral pain syndrome, Pressure pain threshold, Tibiofemoral mobilisation. (JPMA 71: 2506; 2021) **DOI:** [**https://doi.org/10.47391/JPMA.04-585**](https://doi.org/10.47391/JPMA.04-585)

**NIH Risk of Bias Tool**

Quality Assessment of Controlled Intervention Studies

**Was the study described as randomized, a randomized trial, a randomized clinical trial, or an RCT**Yes
**Was the method of randomization adequate (i.e., use of randomly generated assignment)?**
Yes
**Was the treatment allocation concealed (so that assignments could not be predicted)?**Yes
**Were study participants and providers blinded to treatment group assignment?**Cannot Determine, Not Reported, or Not Applicable
**Were the people assessing the outcomes blinded to the participants' group assignments?**Cannot Determine, Not Reported, or Not Applicable
**Were the groups similar at baseline on important characteristics that could affect outcomes (e.g., demographics, risk factors, co-morbid conditions)?**Yes
**Was the overall drop-out rate from the study at endpoint 20% or lower of the number allocated to treatment?**
Yes
**Was the differential drop-out rate (between treatment groups) at endpoint 15 percentage points or lower?**Cannot Determine, Not Reported, or Not Applicable
**Was there high adherence to the intervention protocols for each treatment group?**
Yes
**Were other interventions avoided or similar in the groups (e.g., similar background treatments)?**

Yes
**Were outcomes assessed using valid and reliable measures, implemented consistently across
all study participants?**Yes
**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
**Were outcomes reported or subgroups analyzed prespecified (i.e., identified before analyses were conducted)?**Yes
**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**

Tibiofemoral joint anterior-posterior grade II or III mobilizations are an effective treatment modality for the treatment and management of patellofemoral pain syndrome (PFPS).

**Key Finding #2**

Efficacy of mobilizations was defined as improvements in pain levels, range or motion, and ability to functionally participate. Overall pain level reduction, range of motion improvement, and an improved ability to complete functional activities in patients with PFPS were all outcomes reported secondary to the implementation of these mobilizations.

**Key Finding #3**

There was no significant difference found in in 2 variables of one pain rating scale: the Kujala Anterior Knee pain Scale (AKPS). Pain with weight-bearing and patellar instability were not significantly reduced with the use of these mobilizations.

**Key Finding #4**

Tibiofemoral joint mobilizations should not be used in isolation but should be used in conjunction with other physical therapy modalities such as strengthening and stretching.

**Please provide your summary of the paper**

Manual therapy is one of many modalities utilized in the treatment of patellofemoral pain syndrome (PFPS). By stimulating surrounding structures, joint mobilizations may contribute to pain reduction and targeted muscle activation. While PFPS is thought to be a pathology of the patellofemoral joint, mobilization at the nearby tibiofemoral joint may benefit individuals with PFPS. The goal of this randomized control trial (RCT) was to assess the efficacy of tibiofemoral joint mobilization as a treatment for PFPS. The authors noted that at the time, there were no reported RCTs that looked at these specific variables. PFPS patients were recruited using a non-probability purposive sampling technique. Exclusion criteria included, but was not limited to, patients with a history of knee surgery, arthritis, and patellar subluxation or dislocation. Patients were randomized into a control and experimental group. Both groups received treatment three times per week over four weeks. Both groups received specific hip and knee stretches and exercises as well as a hot pack. However, in addition to this treatment, patients in the experimental group received tibiofemoral joint mobilizations. The specific mobilizations used were an anterior-posterior (AP) grade II or II tibial glide of the tibiofemoral joint with the patient in supine and knee in a certain degree of flexion depending on amount of available range of motion. Pain intensity and knee joint range of motion were the primary outcome measures used to determine the efficacy of the mobilization. Results revealed a significant difference between the experimental and control groups in the following: overall numerical pain rating scale (NRPS), overall pressure-pain threshold (PPT), overall Kujala Anterior Knee Pain Scale (AKPS), range of motion, and functional activities. There was no significant difference in 2 variables of the AKPS: weight- bearing and patellar instability.

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

The findings of this research suggest that TFJ anterior-posterior grade II or III mobilizations are an effective treatment modality for the treatment and management of PFPS and should be used in conjunction with other modalities such as strengthening and stretching. However, one should be cautious when reading these results because the study took place over a 4-week span; therefore, one cannot assume that the benefits are long lasting. An additional mentioned limitation was that physical levels of patients with PFPS was not accounted for as a confounding variable. Lastly, the use of a universal goniometer as the sole measurement for range of motion introduces an inherent level of error due to measurement error. There was no comment about standardization of these measurements.