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## **EFFECTIVENESS OF HIP AND KNEE TARGETED EXERCISES COMBINED WITH ULTRASOUND THERAPY ON PAIN AND FUNCTION IN INDIVIDUALS WITH PATELLOFEMORAL PAIN SYNDROME.**

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**Background:** Patellofemoral pain syndrome (PFPS), caused by injury to the patella or the femur, generally results from overuse of the muscles of the hip and knee that are responsible for stabilizing and moving the patella. Weakness of these muscles can create poor biomechanics that place excess load on the Patellofemoral joint during normal activities. Therefore, adding adjunctive therapeutic modalities such as ultrasound to an exercise regimen that targets strength of the hip and knee musculature may lead to improved, functional outcomes for individuals with PFPS.

**Purpose:** To evaluate whether the combination of therapeutic ultrasound and a hip and knee strengthening exercises program would improve function and reduce pain in individuals with PFPS.

**Methods:** This pre-post experimental study was completed with a convenience sample of individuals ages 18-40 years who had a diagnosis of PFPS. Functioning status of participants was assessed using the Kujala Anterior Knee Pain Scale. Pain was assessed at baseline and after completing a 6-week supervised exercise program of therapeutic ultrasound, hip and knee strengthening exercises. Data were collected using numerical pain rating scale (NPRS) ratings and Kujala scores. Data were statistically analyzed with a paired t-test, with significance at  $p < 0.05$ .

**Results:** Participants showed statistically significant improvement in their pain ( $P < 0.001$ ) and function ( $P < 0.001$ ) after the intervention. The outcomes demonstrated greater than clinically meaningful improvement (Mean NPRS change 4.4; Mean Kujala score change 19.3).

**Conclusion:** The effectiveness of hip and knee focused exercises combined with ultrasound therapy significantly reduces pain and improves function for individuals with PFPS.

**Keywords:** Patellofemoral pain syndrome, Hip strengthening exercises, Knee exercises, Ultrasound therapy, Kujala scale score.