

Additional Effects of Core Stability Exercises on Pain and Function of Patients with Patellofemoral Pain Syndrome; A Randomized Controlled Trial
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Objectives: We aimed to determine whether increases in hip muscle strength and core endurance improve rehabilitation outcomes for patients with patellofemoral pain syndrome (PFPS).

Methods: Sixty participants (25 men [41.7%], 35 women [58.3%], age= 32.28 (5.9) years; height= 166.7(9.80) cm; weight= 66.76 (10.93) kg) with PFPS were randomly assigned into two groups (30 in each group): routine exercise group including quadriceps strengthening plus hamstring, iliotibial band and quadriceps stretch (control) and combined core stability and above-mentioned routine exercise group (intervention). Home-based exercise program was performed at least 5 times/ week for 12 weeks. Patients were evaluated before and immediately after interventions for their pain severity [Visual analogue scale (VAS score)], function [Kujala Anterior Knee Pain Scale (AKPS) questionnaire], anterior, lateral, and posterior core endurance using anterior core muscle endurance, modified Bering- Sorensen and side bridge tests.

Results: There was statistically and clinically significant improvement in pain, function, anterior, posterior and lateral core endurance in both intervention and control groups (2.67 Vs. 1.89, 15.73 Vs. 9.37, 24.62 Vs. 10.29, 22.11 Vs. 5.67, 24.07 Vs. 13.66, respectively; $P < 0.001$ for all outcomes). Improvements in pain and core endurance were significantly greater in intervention group ($P = 0.043$, $P = 0.002$, $P < 0.001$ and $P = 0.011$, respectively). However, there was no statically significant difference between groups after 12- week rehabilitation in Kujala questionnaire score ($P = 0.071$).

Conclusions: Significant improvement was shown in pain and function of both groups after 12-week exercise program. However, improvement of pain in intervention group was significantly greater. It seems that adding core stability exercises to exercise program of patients with PFPS may bring additional value in the terms of pain and function.

Keywords: Anterior Knee pain, Kujala scale, Rehabilitation, VAS score

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