

ORIGINAL RESEARCH

PAIN, FUNCTION, AND STRENGTH OUTCOMES FOR MALES AND FEMALES WITH PATELLOFEMORAL PAIN WHO PARTICIPATE IN EITHER A HIP/CORE- OR KNEE-BASED REHABILITATION PROGRAM

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ABSTRACT

Background: Hip exercise has been recommended for females with patellofemoral pain (PFP). It is unknown if males with PFP will benefit from a similar treatment strategy.

Hypotheses/Purpose: The purpose of this study was to compare improvements in pain, function, and strength between males and females with PFP who participated in either a hip/core or knee rehabilitation program. The directional hypothesis was that females would respond more favorably to the hip/core rehabilitation program and males to the knee program.

Study Design: Randomized-controlled clinical trial

Methods: Patients were randomly assigned to a six-week hip/core or knee rehabilitation program. Visual analog scale (VAS), Anterior Knee Pain Scale (AKPS), and hip and knee isometric strength were collected before and after subjects completed the rehabilitation program. Data were analyzed using an intention-to-treat basis. Separate mixed-model analyses of variance (ANOVA) with repeated measures were used to determine changes in VAS and AKPS and strength changes for subjects classified as treatment responders (successful outcome) and non-responders (unsuccessful outcome).

Results: Regardless of sex or rehabilitation group, VAS ($F_{1,181} = 206.5$; $p < .0001$) and AKPS ($F_{1,181} = 160.4$; $p < 0.0001$) scores improved. All treatment responders demonstrated improved hip abductor ($F_{1,122} = 6.6$; $p = 0.007$), hip extensor ($F_{1,122} = 19.3$; $p < 0.0001$), and knee extensor ($F_{1,122} = 16.0$; $p < 0.0001$) strength. A trend ($F_{1,122} = 3.6$; $p = 0.06$) existed for an effect of sex on hip external rotator strength change. Males demonstrated a 15.4% increase compared to a 5.0% increase for females. All treatment non-responders had minimal and non-significant ($p > 0.05$) strength changes.

Conclusion: On average, males and females with PFP benefitted from either a hip/core or knee rehabilitation program. Subjects with successful outcomes likely had hip and knee weakness that responded well to the intervention. These males and females had similar and meaningful improvements in hip extensor and knee extensor strength. Only males had relevant changes in hip external rotator strength. Clinicians should consider a subgroup of males who may benefit from hip extensor and external rotator exercise and females who may benefit from hip extensor exercise.

Level of Evidence: 2b

Keywords: Anterior knee pain, hip, rehabilitation, sex

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Ethical Approval:

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