Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

The Effects of a Strengthening Exercise Program with EMG Biofeedback to Correct Patellar Alignment and Reduces Knee Pain in Women with Patella femoral Pain Syndrome

Protocol summary

Summary

1. Objective: The objective of this study was to investigate the effects of a strengthening exercise program with electromyographical (EMG) biofeedback on the alignment corrections of the patella and the knee pain in patients with patella_femoral pain syndrome (PFPS). 2. Design: This study was a clinical trial. The populations of this study were women with patella femoral pain syndrome. 3. Setting and Conduct: The participants of this study were 22 females with PFPS. They are randomly divided into two groups: Group 1, including 11, underwent an exercise therapy with biofeedback program and Group 2, including 11, was provided with exercise therapy without biofeedback. The knee pain was quantified by using VAS questionnaire. Radiography technique was also applied to evaluate the knee alignment including sulcus, congruence, tilt angles, and Q angles assessed by clinical tests. 4. Inclusion criteria included 1. Being female 2. Having pain at least in two activities of activities like: going up the stairs, going down the stairs, and squatting. Exclusion criteri included 1. Having a history of knee pathology except PFPS. 2. Having a previous knee injury or surgery 3. Using anti-inflammatory drugs 5. Intervention: Receiving visual feedback to strengthen the muscles during exercise 6. Primary Outcome Variables: The results showed that congruence and Q angle weresignificantly reduced in both groups. However, the patellar tilt was significantly reduced only in strengthening exercise program with biofeedback group. Secondary Outcome Variable: strengthening exercise program with electromyographical biofeedback displayed a better treatment outcome.

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT2017011732008N1**
Registration date: **2017-07-11, 1396/04/20**
Registration timing: **retrospective**

Last update:
Update count: **0**

Registration date

2017-07-11, 1396/04/20

Registrant information

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Recruitment status

Recruitment complete

Funding source

Research Vise President, Bu-Ali Sina University, Hamedan

Expected recruitment start date

2015-01-01, 1393/10/11

Expected recruitment end date

2016-01-21, 1394/11/01

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The Effects of a Strengthening Exercise Program with EMG Biofeedback to Correct Patellar Alignment and Reduces Knee Pain in Women with Patella femoral Pain Syndrome

Public title
Training Effect with EMG Biofeedback on Patella femoral Pain Syndrome
Purpose
Health service research
Inclusion/Exclusion criteria
Inclusion Criteria 1. Being female 2. Having the age range from18 to 30 3. Having a history of chronic pain in the anterior region of the right knee for more than three month 4. Getting a minimum score of three based on the VAS questionnaire 5. Having pain in at least two activities such as going up the stairs, going down the stairs, squatting, sitting on knees, bending the knee more than 90 degrees for a long time, running, and jumping Exclusion Criteria 1. Having a history of knee pathology except PFPS 2. Having a previous knee injury or surgery 3. Using anti-inflammatory drugs 4. Participating in Physical therapy sessions for lower organs in the last three months 5. Having neuromuscular disorders which affect the individual's movement 6. Being pregnancy
Age
From **18 years** old to **30 years** old
Gender
Female

Phase
N/A
Groups that have been masked
No information
Sample size
Target sample size: **22**
Randomization (investigator's opinion)
Randomized
Randomization description
Blinding (investigator's opinion)
Not blinded
Blinding description
Placebo
Not used
Assignment
Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Hamedan University of Medical Sciences and Health Services
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University of Medical Sciences and Health Services, Sahid Fahmideh St., Hamedan
City
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Postal code
65178
Approval date
2014-11-23, 1393/09/02
Ethics committee reference number
p/16/35/9/5838

Health conditions studied

1

Description of health condition studied
Patello femoral disorders
ICD-10 code
M22.2
ICD-10 code description
Patello femoral disorders

Primary outcomes

1

Description
Q angle
Timepoint
Before intervention and 6 weeks after intervention
Method of measurement
Clinical evaluation

2

Description
Congruance angle
Timepoint
Before intervention and 6 weeks after intervention
Method of measurement
X-Ray

3

Description
Tilt angle
Timepoint
Before intervention and 6 weeks after intervention
Method of measurement
X-Ray

Secondary outcomes

1

Description
Pain
Timepoint
Before intervention and 6 weeks after intervention
Method of measurement
VAS questionnaire

Intervention groups

1

Description
Intervention group 1: Strengthening Exercises for knee extensors These exercises were performed in both experimental groups (I and II) equally. The control group remained sedentary. The aim of these exercises were to increase the strength of the vastus medialis more than that of the vastus lateralis. Exercises were performed within 18 session with 3 sessions (1.5 hours each session) per week, lasting for 6 weeks. In the first week, each session were including 3 sets of 10 repetitions (10 seconds each repetition) and the intensity of exercises were increased so that it reached to 5 sets of 30 repetitions at the last week.
Category
Other

2

Description
Intervention group 2: Biofeedback. During the exercises, individuals in one of the experimental groups (Experimental I) received biofeedback about the electrical activity of vastus medialis and lateralis. The second experimental group, as well as the control group did not receive any biofeedback. This biofeedback was including an online figure about the peak electromyography signals of the vastus medialis and lateralis muscles online during the exercise and the subject was advised to change her foot position so that the peak value of electrical activity of the target muscle (Vastus medialis) had the largest possible difference with the other muscle.
Category
Other

Recruitment centers

1

Recruitment center
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Full name of responsible person
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Sponsors / Funding sources

1

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Grant name
-
Grant code / Reference number
-
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Bu_Ali Sina University
Proportion provided by this source
100
Public or private sector
empty
Domestic or foreign origin
empty
Category of foreign source of funding
empty
Country of origin
Type of organization providing the funding
empty

Person responsible for general inquiries

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Sharing plan

Deidentified Individual Participant Data Set (IPD)

empty

Study Protocol

empty

Statistical Analysis Plan

empty

Informed Consent Form

empty

Clinical Study Report

empty

Analytic Code

empty

Data Dictionary

empty