

Clinical Trial Protocol

Iranian Registry of Clinical Trials

18 Sep 2026

Effect of quadriceps muscle strengthening exercises on the fiber angle ratio of vastus medialis obliquus to vastus lateralis in patient with patellofemoral pain syndrome

Protocol summary

Summary

This study is a randomized controlled trial to compare the fiber angle ratio of vastus medialis obliquus to vastus lateralis in patient with patellofemoral pain syndrome before and after quadriceps strengthening. Sixty subjects with patellofemoral between 12 and 40 years of ages will randomly assigned in 2 groups; the exercise group and control group. The quadriceps strength in patient with patellofemoral pain syndrome measures by using an isokinetic dynamometer and the fiber angle of the vastus medialis obliquus and vastus lateralis will be assessed by ultrasonography. Intervention consisted of 4 weeks of quadriceps strengthening. At the end of 4 weeks All measurements will be performed again.

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT2014093019346N1**

Registration date: **2014-12-19, 1393/09/28**

Registration timing: **prospective**

Last update:

Update count: **0**

Registration date

2014-12-19, 1393/09/28

Registrant information

Name

Roshanak Honarpisheh

Name of organization / entity

Semnan University of Medical Sciences and Health Services

Country

Iran (Islamic Republic of)

Phone

+98 21 8882 8947

Email address

r.honarpisheh@semums.ac.ir

Recruitment status

Recruitment complete

Funding source

Semnan University of Medical Sciences

Expected recruitment start date

2014-12-22, 1393/10/01

Expected recruitment end date

2015-06-22, 1394/04/01

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Effect of quadriceps muscle strengthening exercises on the fiber angle ratio of vastus medialis obliquus to vastus lateralis in patient with patellofemoral pain syndrome

Public title

Effect of quadriceps muscle strengthening exercises on the fiber angle ratio of vastus medialis obliquus to vastus lateralis in patient with patellofemoral pain syndrome

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria: peripatellar or retropatellar pain provoked by at least 2 of the following activities: prolonged sitting with flexed knees, stair climbing, squatting, running, kneeling, and jumping(including landing after a jump); exhibition of 2 or more of the following clinical criteria on assessment: pain on direct compression of the patella against the femoral condyles with the knee in full extension, tenderness on palpation

of the posterior edge at the medial and/or lateral border of the patella, and pain on direct compression of the patella against the femur during isometric quadriceps contraction with the knee in slight flexion; age between 12 and 40 years old; the presence of patellofemoral pain for a minimum of 3 months. Exclusion criteria: history or evidence of other knee disorders like ligament injury, bursitis, meniscal injury, or osteoarthritis; lower limb surgery or trauma during last year; patellar instability; referred pain from the lumbar spine and ankle joint; existence of any abnormality in lower limb and spine; loss of flexibility of the soft tissue structures such as the quadriceps, hamstrings, triceps surae; the position and mobility of the subject's patella were then clinically assessed using the method described by McEwan et al. The subjects were also excluded if their patellae demonstrated lateral deviation greater than 5 mm; lateral patella tilt; hypo or hypermobility on medial glide of the patella.

Age

From **12 years** old to **40 years** old

Gender

Both

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **30**

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

Semnan university of medical science

Street address

Semnan university of medical science-Semnan-Iran

City

Semnan

Postal code

Approval date

2014-12-16, 1393/09/25

Ethics committee reference number

93/538806

Health conditions studied

1

Description of health condition studied

patellofemoral pain syndrom

ICD-10 code

M22.2

ICD-10 code description

Patellofemoral disorders

Primary outcomes

1

Description

Fiber angles of vastus lateralis

Timepoint

Before intervention and after 4 weeks intervention

Method of measurement

Scale of degrees with ultrasonography

2

Description

Fiber angles of vastus medialis obliquus

Timepoint

Before intervention and after 4 weeks intervention

Method of measurement

Scale of degrees with ultrasonography

3

Description

fiber angle ratio of vastus medialis obliquus to vastus lateralis

Timepoint

Before intervention and after 4 weeks intervention

Method of measurement

Scale of degrees with ultrasonography

Secondary outcomes

1

Description

Quadriceps strength

Timepoint

Before intervention and after 4 weeks intervention

Method of measurement

Newton per meter with biodex dynamometr

Intervention groups

1

Description

Patients in the intervention group perform the quadriceps exercise, three times a week during 4 weeks. exercise protocol include: weeks 1-2: wall squat(0-45 of knee flexion)/15 repetition quadriceps isometric/4 sets of 25 repetitions straight leg raises/3 sets of 10 repetition

weeks 3-4: wall squat(0-60 of knee flexion)/15 repetition quadriceps isometric/4 sets of 25 repetition straight leg rise/3 sets of 10 repetition terminal knee extension/3 sets of 10 repetition an exercise log provides for monitoring all subjects .If the load level elicited pain, it will decrease

Category

Rehabilitation

2

Description

The control group do not participate in any intervention.

Category

N/A

Recruitment centers

1

Recruitment center

Name of recruitment center

Outpatient clinics of Semnan University of medical sciencess

Full name of responsible person

roshanak honarpisheh

Street address

No.24-neuromuscular rehabilitation research center- Ghods Blvd-Mashahir square-Semnan-Iran

City

Semnan

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Deputy of research and technology of Semnan University of Medical Sciences

Full name of responsible person

Dr. Ali Rashidy pour

Street address

deputy of research and technology of Semnan university of medical sciences-No.47-university of medical sciences-Basij Blvd-Semnan-Iran

City

Semnan

Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?

Yes

Title of funding source

Deputy of research and technology of Semnan University of Medical Sciences

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

Contact

Name of organization / entity

Semnan university of medical science

Full name of responsible person

Roshanak Honarpisheh

Position

Bachelor

Other areas of specialty/work

Street address

rehabilitation school-Semnan university of medical sciences--Damghan road-Semnan-Iran

City

Semnan

Postal code

Phone

+98 21 8882 8947

Fax

Email

r.honarpisheh@semums.ac.ir

Web page address

Person responsible for scientific inquiries

Contact

Name of organization / entity

Semnan university of medical sciences

Full name of responsible person

Roshanak Honarpisheh

Position

Bachelor

Other areas of specialty/work

Street address

rehabilitation school-Semnan university of medical sciences--Damghan road-Semnan-Iran

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Person responsible for updating data

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rehabilitation school-Semnan university of medical
sciences-Damghan road-Semnan-Iran

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Semnan

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+98 21 8882 8947

Fax**Email**

r.honarpisheh@semums.ac.ir

Web page address**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