# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

28 Feb 2026

## The effect of adding eccentric exercises to gait retraining exercises on pain, kinetics and kinematics of runners with patellofemoral pain syndrome

## Protocol summary

**Study aim**

Are adding eccentric exercises to gait retraining exercises have any effect on pain, kinetics and kinematics during running in patients with patellofemoral pain?

**Design**

Clinical trial that including control group, parallel groups, single blinded, randomized, 3 groups on 30 patients, The site /http://randomizer.org is used for randomization.

**Settings and conduct**

The effect of adding eccentric exercises to gait retraining exercises on runners with patellofemoral pain. The kinetics and kinematics parameters are performed before and after 8 weeks of intervention in the biomechanical laboratory of Kharzami University. Participants and Analyzer are unaware of how the allocation and results are.

**Participants/Inclusion and exclusion criteria**

inclusions: Male and female runners with 3 years continuous history of recreational sports; 18 to 40 years old age group, 20 and 25 body mass index patients have a patellofemoral pain syndrome with a history of 2 months and intensity of 3 to 7 on the visual analog scale. exclusions: history of lower and torso injury in the past year, lower limb abnormalities, surgery in the lower limbs, especially the knee, before participating.

**Intervention groups**

The retraining group includes patients that have patellofemoral pain and receive gait retraining with using verbal feedback. the eccentric exercises Group includes patients who receive eccentric exercises in addition to gait retraining. the control group includes patients who do not receive any intervention. both groups participate 3 sessions each week for 8 weeks with the presence of the researcher. each session take 90 minutes includes warm up, exercise and cooling down. eccentric exercises are based on previous studies of patellofemoral pain.

**Main outcome variables**

Pain, ground reaction force, pelvic drop, hip adduction, knee flexion, knee valgus and dorsiflexion.

## General information

**Reason for update**

**Acronym**

**IRCT registration information**

IRCT registration number: **IRCT20220812055662N1**
Registration date: **2022-09-29, 1401/07/07**
Registration timing: **prospective**

Last update: **2022-09-29, 1401/07/07**
Update count: **0**

**Registration date**

2022-09-29, 1401/07/07

**Registrant information**

**Name**
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The University of kharazmi
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**Recruitment status**

**Recruitment complete**

**Funding source**

**Expected recruitment start date**

2022-10-08, 1401/07/16

**Expected recruitment end date**

2022-12-03, 1401/09/12

**Actual recruitment start date**

empty

**Actual recruitment end date**

empty

**Trial completion date**

empty

**Scientific title**

The effect of adding eccentric exercises to gait retraining exercises on pain, kinetics and kinematics of runners with patellofemoral pain syndrome

**Public title**

The effect of eccentric exercises with gait retraining on reducing patellofemoral pain

**Purpose**

Treatment

**Inclusion/Exclusion criteria**

**Inclusion criteria:**

Male and female runners with a continuous history of recreational sports in the last 3 years 18 to 40 years age group Standard Body Mass Index between 20 –25 Patellofemoral pain syndrome with a history of 2 months and a intensity of 3 to 7 on a visual analog scale

**Exclusion criteria:**

History of lower and upper body damage in the past year Lower body zone abnormalities Surgery history in the lower limbs, especially the knee, before participating in the study

**Age**

From **18 years** old to **40 years** old

**Gender**

Both

**Phase**

N/A

**Groups that have been masked**

- Participant
- Data analyser

**Sample size**

Target sample size: **30**

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

After initial review, using the http://randomizer.org/ website, patients who have criteria for entering the study randomly participate in retraining، eccentric exercises and control groups. randomization will be simple type. hiding the random allocation using computer-generated randomized block table ( number 1 for retraining group, number 2 for eccentric exercises group and number 3 for control group ). The random numerical sequence is placed in non-transparent and sealed envelopes and will be opened by a third party and the treatment process will continue in accordance with the group's assignment. the evaluator will evaluate the results before the intervention and after 8 weeks of intervention, independent of the hypothesis and methods of the study.

**Blinding (investigator's opinion)**

Single blinded

**Blinding description**

Participants read the consent form and present in a 30-minute session of the study groups then participate in this study with satisfaction, without the authority to select their group. the names of the patients are informed by a person unaware of the identity characteristics and Physically, patients randomly divided into three equal groups by / http://randomizer.org and each group is placed separately in sealed envelopes. Each person receive own training and exercises according to their assigned group. the analyzer also examines and compares changes made before and after 8 weeks without knowing the hypotheses, study methods, and patient specifications.

**Placebo**

Not used

**Assignment**

Parallel

**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

**Ethics committee**

**Name of ethics committee**

Ethics committee of sport sciences Research Institute

**Street address**

No. 45, Payande 5 Ave., Mosala 18 Blvd.,Rastgar St.

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**Approval date**

2022-07-05, 1401/04/14

**Ethics committee reference number**

IR.SSRC.REC.1401.040

## Health conditions studied

### 1

**Description of health condition studied**

patellofemoral pain syndrome

**ICD-10 code**

M22.2

**ICD-10 code description**

Patellofemoral disorders

## Primary outcomes

### 1

**Description**

Pain

**Timepoint**

Before the intervention and after 8 weeks of intervention

**Method of measurement**

Pain questionnaire of Visual Analogue scale (VAS)

## Secondary outcomes

### 1

**Description**
Kinetic: Ground reaction force
**Timepoint**
Before the intervention and after 8 weeks of intervention
**Method of measurement**
Force plate

### 2

**Description**
Kinematic: pelvic drop
**Timepoint**
Before the intervention and after 8 weeks of intervention
**Method of measurement**
Three-dimensional (3D) motion analysis system

### 3

**Description**
Kinematic: hip adduction
**Timepoint**
Before the intervention and after 8 weeks of intervention
**Method of measurement**
Three-dimensional (3D) motion analysis system

### 4

**Description**
Kinematic: knee flexion
**Timepoint**
Before the intervention and after 8 weeks of intervention
**Method of measurement**
Three-dimensional (3D) motion analysis system

### 5

**Description**
Kinematic: knee valgus
**Timepoint**
Before the intervention and after 8 weeks of intervention
**Method of measurement**
Three-dimensional (3D) motion analysis system

### 6

**Description**
Kinematic: dorsiflexion
**Timepoint**
Before the intervention and after 8 weeks of intervention
**Method of measurement**
Three-dimensional (3D) motion analysis system

## Intervention groups

### 1

**Description**
Intervention group: This group performs gait retraining with verbal feedback. gait retraining done on a treadmill. People run on a treadmill at all times at a convenient speed. Verbal feedback in the form of a recipe such as "Knee retention in the direction of the toes, reduced pelvic sagging and maintaining pelvic symmetry، Decreasing vertical acceleration ( is provided by the tester: a quiet and calm walking style).In general, the practice time starts in 15 minutes for the first session and 3 to 9 minutes per week is added to the time. While the time of gait retaining is reduced from 100% in the first 4 weeks to 25% in the last weeks and then removed. Exercises are followed 3 days a week for 8 weeks.
**Category**
Treatment - Other

### 2

**Description**
Intervention group: this group, After performing the retraining group's practices, performs the protocol of the eccentric exercises. the participants will do the exercises correctly، The intensity of the exercises will increase progressively each week, and at the beginning of each stage, the exercises will be performed in a simpler and smaller volume، Step by step, more difficult exercises and less large exercises will be more difficult in the next steps, respectively, with the progress and improvement of the performance of the training athlete. In general, the practice time is 90 minutes, which is done after warm up and gait retraining. exercises are followed 3 days a week for 8 weeks.
**Category**
Treatment - Other

### 3

**Description**
Control group: This group continues their special routine exercises.
**Category**
N/A

## Recruitment centers

### 1

**Recruitment center**
**Name of recruitment center**
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## Sponsors / Funding sources

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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**
The University of Kharazmi
**Proportion provided by this source**
100
**Public or private sector**
Private
**Domestic or foreign origin**
Domestic
**Category of foreign source of funding**
*empty*
**Country of origin**
**Type of organization providing the funding**
Persons

## Person responsible for general inquiries

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## Person responsible for updating data

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## Sharing plan

**Deidentified Individual Participant Data Set (IPD)**

Yes - There is a plan to make this available

**Study Protocol**

Yes - There is a plan to make this available

**Statistical Analysis Plan**

Yes - There is a plan to make this available

**Informed Consent Form**

Yes - There is a plan to make this available

**Clinical Study Report**

Yes - There is a plan to make this available

**Analytic Code**

Undecided - It is not yet known if there will be a plan to make this available

**Data Dictionary**

Undecided - It is not yet known if there will be a plan to make this available

**Title and more details about the data/document**

Only data related to demographic information and consequences are shared.

**When the data will become available and for how long**

After printing the article / articles are arrogant from the study

**To whom data/document is available**

The data can be displayed and shared at the logical request of the Iranian Clinical Trials Registration Center, journals and academic researchers / researchers who are researching and conducting scientific activities in this field.

**Under which criteria data/document could be used**

Data analysis and the use of documentation can only be done on the condition that their results be included in the systematic review articles conducted by researchers and academic authors. Terms of registration for sending data and documents including: 1. Send an email ( preferably with valid academic addresses ) to one of the study researchers. 2. Brief and logical explanation of how to use data or documentation. 3. Ensure the registration of a systematic review study protocol that has given access to data or documentation.

**From where data/document is obtainable**

By requesting study researchers Elahe Omidvar Elahe.omidvar@khu.ac.ir Malihe Hadadnezhad Malihehadadnezhad@khu.ac.ir Amir Letafatkar Amir.letafatkar@khu.ac.ir

**What processes are involved for a request to access data/document**

The applicant can request details from the researchers within 7 to 10 days using the email sent by email.

**Comments**