# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

27 Jul 2026

## Effectiveness of hip muscle training with and without focus on abdominal muscles on pain, range of motion, hip muscle strength, physical performance and patient-reported outcomes in athletes with longstanding adductor-related groin pain: A randomized controlled trial

## Protocol summary


**Study aim**

Investigating the effect of strengthening thigh muscles with and without emphasis on abdominal muscles on pain during functional activity and resisted contraction, range of motion, thigh muscle strength, and patient-centered outcomes in athletes with chronic groin pain related to adductor muscles.

**Design**

This study is a randomized, double-blind, parallel-group controlled trial conducted on 30 patients.

**Settings and conduct**

This study will be conducted in sports clinics in Mashhad. The study subjects are athletes with chronic groin pain who will attend the sports physiotherapy clinic with a doctor's referral or direct referral. Then, participants will be asked to complete a demographic questionnaire and other questionnaires. In the control group, athletes will perform exercises focusing on the hip abductor muscles, while in the treatment group, emphasis will be placed on the core muscles of the trunk. Blinding will be done in the form of blinding of the subjects under study, assessors, and analysts.

**Participants/Inclusion and exclusion criteria**

Inclusion Criteria: Athletes aged 18 to 50 Groin pain lasting at least 2 months Groin pain during or after sports activity Exclusion Criteria: Palpable hernia in the inguinal or femoral region, or pain over the conjoined tendon Clinical symptoms of prostatitis or urinary tract infection Lower back pain in the T10 to L5 vertebral region

**Intervention groups**

The intervention group’s therapy exercises will focus on isometric and eccentric strength of the hip adductor and abductor muscles, as well as the abdominal muscles. The control group’s therapy exercises will focus on isometric and eccentric strength of the hip adductor and abductor muscles, without emphasis on the abdominal muscles.

**Main outcome variables**

Pain during functional activity, pain during resisted contraction, range of motion, strength, patient-centered outcomes.


## General information

**Reason for update**

**Acronym**

**IRCT registration information**

IRCT registration number: **IRCT20230410057876N1**
Registration date: **2025-07-20, 1404/04/29**
Registration timing: **registered_while_recruiting**

Last update: **2025-07-20, 1404/04/29**
Update count: **0**

**Registration date**

2025-07-20, 1404/04/29

**Registrant information**


**Name**

hossein rafsanjani deh ghazi

**Name of organization / entity**

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**Recruitment status**

**Recruitment complete**

**Funding source**

**Expected recruitment start date**

2025-06-10, 1404/03/20

**Expected recruitment end date**

2025-09-23, 1404/07/01

**Actual recruitment start date**

empty

**Actual recruitment end date**

empty

**Trial completion date**

empty

**Scientific title**

Effectiveness of hip muscle training with and without focus on abdominal muscles on pain, range of motion, hip muscle strength, physical performance and patient-reported outcomes in athletes with longstanding adductor-related groin pain: A randomized controlled trial

**Public title**

Abdominal Muscles Training in groin pain

**Purpose**

Treatment

**Inclusion/Exclusion criteria**

**Inclusion criteria:**

Athletes aged 18 to 50 Groin pain lasting at least 2 months Groin pain during or after sports activity Pain location at the junction of the adductor tendon to the pubic bone Motivation to return to sports participation at the pre-injury level Pain location at the junction of the adductor tendon to the pubic bone Pain at the junction of the adductor tendon to the pubic bone during resisted adduction Tenderness of the adductor tendons and/or their attachment to the pubic bone

**Exclusion criteria:**

Palpable hernia in the inguinal or femoral region, or pain over the conjoined tendon Clinical symptoms of prostatitis or urinary tract infection Lower back pain in the T10 to L5 vertebral region Hip osteoarthritis Clinical suspicion of nerve entrapment syndrome involving the ilioinguinal, genitofemoral, or lateral femoral cutaneous nerve Inability to perform an active sports program Use of anticoagulant medications Instability of the medial collateral ligament of the affected knee(s)

**Age**

From **18 years** old to **50 years** old

**Gender**

Both

**Phase**

N/A

**Groups that have been masked**

- Outcome assessor
- Data analyser

**Sample size**

Target sample size: **30**

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

In this study, a block randomization method of size four will be used to allocate participants to two treatment groups. Each block will include two participants from the control group (A) and two participants from the intervention group (B). In order to reduce bias and maintain statistical balance between groups, different orders of block sequences will be considered. Allowed combinations include: AABB, ABAB, ABBA, BBAA, BABA, and BAAB. Random sequences will be generated using the reputable website Sealedenvelope.com. The resulting sequences will be placed in opaque, sealed envelopes, and upon participant arrival, the sample allocator will randomly open one of the envelopes. The participant will be assigned to the appropriate group according to the order listed on the envelope. In order to conceal allocation and prevent bias in the selection process, sealed envelopes will be used and will be prepared by individuals unaware of the study contents.

**Blinding (investigator's opinion)**

Double blinded

**Blinding description**

In this study, a blinding approach will be implemented involving both the outcome assessor and the data analyst. An independent evaluator will be designated as the outcome assessor, who will have no involvement in the study design, intervention delivery, or group allocation process. The assessor will remain fully blinded to the group assignments and intervention details. Clinical outcomes will be evaluated at two time points: baseline (prior to the intervention) and immediately after completion of the intervention period (week 8). Furthermore, data analysis will be conducted under blinded conditions. Prior to statistical processing, the dataset will be anonymized such that group identifiers are replaced with neutral codes (e.g., Group 1 and Group 2). The analyst will receive the de-identified data and will be unaware of the actual treatment allocation until the analysis is finalized.

**Placebo**

Not used

**Assignment**

Parallel

**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

**Ethics committee**

**Name of ethics committee**

Ethics Committee of Mashhad University of Medical Sciences

**Street address**

Mashhad - Azadi Square - East Gate of Ferdowsi University of Mashhad - University Campus

**City**

Mashhad

**Province**

Razavi Khorasan

**Postal code**

9177948964

**Approval date**

2025-04-28, 1404/02/08

**Ethics committee reference number**

IR.MUMS.FHMPM.REC.1404.040

## Health conditions studied

### 1

**Description of health condition studied**
Longstanding groin pain related to the adductor muscles
**ICD-10 code**
S76.2
**ICD-10 code description**
Injury of adductor muscle, fascia and tendon of thigh

## Primary outcomes

### 1

**Description**
pain during functional activity
**Timepoint**
Before the start of the intervention - After six weeks of intervention
**Method of measurement**
Visual Analogue Scale (VAS)

## Secondary outcomes

### 1

**Description**
Pain during resisted contraction
**Timepoint**
Before the start of the intervention - After six weeks of intervention
**Method of measurement**
Visual analogue scale (VAS)

### 2

**Description**
Range of Motion
**Timepoint**
Before the start of the intervention - After six weeks of intervention
**Method of measurement**
Bent Knee Fall Out test

### 3

**Description**
Strength
**Timepoint**
Before the start of the intervention - After six weeks of intervention
**Method of measurement**
Handheld dynamometer

### 4

**Description**
Patient-centered outcomes
**Timepoint**
Before the start of the intervention - After six weeks of intervention
**Method of measurement**
The Copenhagen Hip and Groin Outcome Scale (HAGOS)

## Intervention groups

### 1

**Description**
Intervention group: Athletes in the intervention group will perform exercises under the supervision of one of two sports physiotherapists in the sports club for 6 weeks (3 days per week, odd days). Both physiotherapists will be trained in advance to provide a standard therapeutic exercise. Since the reduction in the strength of adductor muscles is evident in people with chronic groin pain and therapeutic exercise focused on isometric and eccentric strength of adductor and abductor muscles has been recommended in previous studies to reduce pain and restore function in athletes with chronic groin pain, the exercises provided for the muscles in question will also include these types of contractions, since in athletes with chronic groin pain, these two muscles are more likely to change than others among the trunk muscles. Therefore, exercises with maximum contraction of these muscles are recommended. The therapeutic exercise program of the intervention group includes strengthening the thigh muscles along with strengthening the abdominal muscles. The approximate duration of each session will be 60 minutes. Warm-up, fixed hip adduction, bilateral hip adduction, lateral hip adduction, hip abduction/adduction glide, machine adduction, Copenhagen adduction. Core exercises: Plank with leg raise, crunch, bird-dog exercise
**Category**
Rehabilitation

### 2

**Description**
Control group: Athletes in the control group will be supervised by one of two sports physiotherapists in a sports club for 6 weeks (3 days per week, even days). Both physiotherapists will be trained in advance to provide a standard therapeutic exercise. Research shows that weakness in adductor muscle contractions is a common problem in people with chronic groin pain. Also, previous studies have shown that therapeutic exercises focusing on strengthening isometric and eccentric contractions of adductor and abductor muscles can help reduce pain and improve performance in athletes. Therefore, the proposed exercises will include these types of contractions. The approximate duration of each session will be 45 minutes. Warm-up, fixed thigh adduction, bilateral thigh adduction, lateral thigh adduction, thigh abduction/adduction, adduction with a device, Copenhagen adduction
**Category**
Rehabilitation

## Recruitment centers

**1**

**Recruitment center**

**Name of recruitment center**
Mehregan Pars

**Full name of responsible person**
Mohammad Hossein Khabbaz

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Vakil Abad 35, First Intersection Corner, Mehregan Pars Building

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## Sponsors / Funding sources

**1**

**Sponsor**

**Name of organization / entity**
Mashhad University of Medical Sciences

**Full name of responsible person**
Deputy of Research and Technology

**Street address**
Shahid Fakoori Boulevard, between Shahid Javan Square and Al Shahidi

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presidentoffice@mums.ac.ir

**Grant name**

**Grant code / Reference number**

**Is the source of funding the same sponsor organization/entity?**
No

**Title of funding source**
Mashhad university of medical sciences

**Proportion provided by this source**
100

**Public or private sector**
Public

**Domestic or foreign origin**
Domestic

**Category of foreign source of funding**
*empty*

**Country of origin**

**Type of organization providing the funding**
Academic

## Person responsible for general inquiries

**Contact**

**Name of organization / entity**
Mashhad University of Medical Sciences

**Full name of responsible person**
Hossein Rafsanjani Deh Ghazi

**Position**
Assistant Professor

**Latest degree**
Ph.D.

**Other areas of specialty/work**
Physiotherapy

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## Person responsible for scientific 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**
No - There is not a plan to make this available
**Informed Consent Form**
No - There is not a plan to make this available
**Clinical Study Report**
Yes - There is a plan to make this available
**Analytic Code**
No - There is not a plan to make this available
**Data Dictionary**
No - There is not a plan to make this available
**Title and more details about the data/document**
Only information related to the primary outcome (pain during function) can be shared after the study is completed.
**When the data will become available and for how long**
One year after the publication of the article
**To whom data/document is available**
Researchers affiliated with academic and scientific institutions
**Under which criteria data/document could be used**
Studies in the relevant field with an official letter of introduction from academic institutions
**From where data/document is obtainable**
Email: Rafsanjanidh@mums.ac.ir Hossein Rafsanjani Deh Ghazi
**What processes are involved for a request to access data/document**
After obtaining an introduction letter from academic institutions and attaching the request to the Deputy of Research and Technology
**Comments**