Clinical Trial Protocol
Iranian Registry of Clinical Trials

10 Jun 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

Country

Iran (Islamic Republic of)

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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

Street address
Mashhad - Azadi Square - East Gate of Ferdowsi University of Mashhad - University Campus - Faculty of Allied Medical Sciences and Rehabilitation

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Person responsible for scientific inquiries

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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