

Clinical Trial Protocol

Iranian Registry of Clinical Trials

12 Sep 2026

The effect of adding dry needling to muscle energy technique on flexibility and physical performance in athletes with hamstring tightness: a randomized controlled trial

Protocol summary

Study aim

To evaluate and compare the immediate and short-term effects of active dry needling combined with muscle energy technique (MET) versus sham dry needling combined with MET on hamstring flexibility, stretch tolerance, and functional performance in individuals with hamstring muscle tightness.

Design

Randomized, double-blind, parallel-group, superiority clinical trial.

Settings and conduct

The study is conducted at the School of Rehabilitation Sciences, Iran University of Medical Sciences. Eligible participants are randomly assigned to two groups using block randomization. Outcome assessors and participants are blinded to group allocations.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Recreational athletes aged 18 to 35 years; presence of hamstring tightness (Active Knee Extension [AKE] angle less than 160 degrees / AKE deficit of 20 degrees or greater); no history of lower extremity surgery or severe musculoskeletal injury. Exclusion criteria: History of spine or lower limb surgery; lumbar radiculopathy or back pain within the past year; history of prior dry needling or acupuncture; needle phobia; coagulation disorders; active skin lesions at intervention site.

Intervention groups

Intervention group 1: Active dry needling applied to the hamstring muscle trigger points, followed by Muscle Energy Technique (MET). Intervention group 2 (Control/Sham): Sham dry needling applied to the same points, followed by the same MET protocol.

Main outcome variables

Active Knee Extension (AKE) range of motion measured in degrees using a goniometer, and hamstring stretch tolerance measured using a Visual Analog Scale (VAS)

before and immediately after intervention.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20180728040618N12**

Registration date: **2026-09-04, 1405/06/13**

Registration timing: **prospective**

Last update: **2026-09-04, 1405/06/13**

Update count: **0**

Registration date

2026-09-04, 1405/06/13

Registrant information

Name

Holakoo Mohsenifar

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 21 2610 6933

Email address

mohsenifar.h@iums.ac.ir

Recruitment status

Not yet recruiting

Funding source

Expected recruitment start date

2026-09-23, 1405/07/01

Expected recruitment end date

2027-03-20, 1405/12/29

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The effect of adding dry needling to muscle energy technique on flexibility and physical performance in athletes with hamstring tightness: a randomized controlled trial

Public title

Effect of dry needling and muscle energy technique on hamstring tightness in athletes

Purpose

Treatment

Inclusion/Exclusion criteria**Inclusion criteria:**

Recreational athletes aged 18 to 35 years Presence of hamstring tightness defined as an Active Knee Extension (AKE) deficit of 20 degrees or greater Signing written informed consent to participate in the study

Exclusion criteria:

History of lower extremity surgery, orthopedic injuries, or neurological disorders History of low back pain within the past year History of prior dry needling or acupuncture Needle phobia Coagulation disorders or use of anticoagulant medications Contraindications to dry needling (e.g., diabetes, vascular diseases, epilepsy, active skin lesions/infections at the treatment site, allergy, psychiatric disorders) Concurrent hamstring stretching exercises or participation in other physical therapy or exercise programs during the study period

Age

From **18 years** old to **35 years** old

Gender

Both

Phase

N/A

Groups that have been masked

- Participant
- Outcome assessor

Sample size

Target sample size: **30**

Randomization (investigator's opinion)

Randomized

Randomization description

Participants were randomly allocated into two groups (Intervention and Control) with a 1:1 ratio using a computer-generated randomization list (block randomization with variable block sizes). Allocation concealment was maintained using sealed envelopes.

Blinding (investigator's opinion)

Double blinded

Blinding description

This study is double-blinded (participants and outcome assessor). To blind the participants, sham dry needling is used in the control group. To blind the outcome assessor, group allocations are kept hidden from the assessor.

Placebo

Used

Assignment

Parallel

Other design features**Secondary Ids**

empty

Ethics committees**1****Ethics committee****Name of ethics committee**

Ethics Committee of Iran University of Medical Sciences

Street address

Iran University of Medical Sciences, Shahid Hemmat Highway, Tehran

City

Tehran

Province

Tehran

Postal code

1449614535

Approval date

2026-08-31, 1405/06/09

Ethics committee reference number

IR.IUMS.REC.1402.744

Health conditions studied**1****Description of health condition studied**

Hamstring muscle tightness

ICD-10 code

M62.4

ICD-10 code description

Contracture of muscle

Primary outcomes**1****Description**

Active knee extension range of motion (hamstring flexibility)

Timepoint

Before intervention and immediately after intervention

Method of measurement

Goniometer during Active Knee Extension (AKE) test

2**Description**

Hamstring stretch tolerance

Timepoint

Before intervention and immediately after intervention

Method of measurement

Visual Analogue Scale (VAS) during Active Knee Extension test

Secondary outcomes

1

Description

Single leg hop distance

Timepoint

Before intervention and immediately after intervention

Method of measurement

Measuring tape in centimeters

2

Description

Triple hop distance

Timepoint

Before intervention and immediately after intervention

Method of measurement

Measuring tape in centimeters

Intervention groups

1

Description

Intervention group: Participants receive active dry needling applied to active trigger points of the hamstring muscle in 3 sessions (every other day), followed immediately by muscle energy technique (MET) for hamstring stretching.

Category

Rehabilitation

2

Description

Control group: Participants receive sham dry needling (using non-penetrating sham needles over the hamstring muscle area) in 3 sessions (every other day), followed immediately by the identical muscle energy technique (MET) protocol as the intervention group.

Category

Placebo

Recruitment centers

1

Recruitment center

Name of recruitment center

School of Rehabilitation Sciences, Iran University of Medical Sciences

Full name of responsible person

Holakoo Mohsenifar

Street address

No. 23, Shah Nazari St, Madar Sq, Mirdamad Blvd, Tehran

City

Tehran

Province

Tehran

Postal code

1540913711

Phone

+98 21 2222 8051

Email

mohsenifar.h@iums.ac.ir

Web page address

<https://rehab.iums.ac.ir>

Sponsors / Funding sources

1

Sponsor

Grant name

Grant code / Reference number

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

empty

Title of funding source

Proportion provided by this source

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

2

Sponsor

Name of organization / entity

Iran University of Medical Sciences

Full name of responsible person

Holakoo Mohsenifar

Street address

Hemmat Expressway, Iran University of Medical Sciences

City

Tehran

Province

Tehran

Postal code

1449614535

Phone

+98 21 86701

Email

mohsenifar.h@iums.ac.ir

Web page address

<https://iums.ac.ir>

Grant name

Grant code / Reference number

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

Yes

Title of funding source

Iran 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
Iran University of Medical Sciences
Full name of responsible person
Holakoo Mohsenifar
Position
Associate Professor
Latest degree
Ph.D.
Other areas of specialty/work
Physiotherapy
Street address
No. 23, Shah Nazari St, Madar Sq, Mirdamad Blvd,
Tehran
City
Tehran
Province
Tehran
Postal code
1540913711
Phone
+98 21 2222 8051
Email
mohsenifar.h@iums.ac.ir
Web page address
<https://rehab.iums.ac.ir>

Person responsible for scientific inquiries

Contact

Name of organization / entity
Iran University of Medical Sciences
Full name of responsible person
Holakoo Mohsenifar
Position
Associate Professor
Latest degree
Ph.D.
Other areas of specialty/work
Physiotherapy
Street address
No. 23, Shah Nazari St, Madar Sq, Mirdamad Blvd,
Tehran
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1540913711
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+98 21 2222 8051
Email
mohsenifar.h@iums.ac.ir
Web page address
<https://rehab.iums.ac.ir>

Person responsible for updating data

Contact

Name of organization / entity
Iran University of Medical Sciences
Full name of responsible person
Holakoo Mohsenifar
Position
Associate Professor
Latest degree
Ph.D.
Other areas of specialty/work
Physiotherapy
Street address
No. 23, Shah Nazari St, Madar Sq, Mirdamad Blvd,
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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

Yes - There is a plan to make this available

Data Dictionary

Yes - There is a plan to make this available

Title and more details about the data/document

De-identified individual participant data, study protocol, and outcome measurements including AKE ROM, stretch tolerance, and leg hop test results.

When the data will become available and for how long

Starting 6 months after publication of the main results in a peer-reviewed journal

To whom data/document is available

Academic and clinical researchers in the field of physiotherapy and sports rehabilitation.

Under which criteria data/document could be used

For systematic reviews, meta-analyses, and secondary analytical studies upon approval of a formal proposal.

From where data/document is obtainable

Dr. Holakoo Mohsenifar (Email: mohsenifar.h@iums.ac.ir)

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

Applicants must send a formal request email to the

principal investigator along with a brief research proposal. The request will be evaluated by the study investigators within a maximum of 14 business days.

Comments

Data will be made available solely for non-commercial academic research after signing a data sharing agreement.