Clinical Trial Protocol
Iranian Registry of Clinical Trials

09 Nov 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

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

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Person responsible for scientific inquiries

Contact

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Full name of responsible person

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Position

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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

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Latest degree

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Other areas of specialty/work

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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.