Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Comparison of the immediate effect of the fascia distortion model (FDM) and muscle energy technique (MET) on hamstring muscle flexibility in non-professional male athletes

Protocol summary

Study aim

Comparison of the Effectiveness of Fascial Distortion Model (FDM) and Muscle Energy Technique (MET) on Hamstring Flexibility in Non-Professional Male Athletes

Design

A randomized controlled clinical trial (RCT) with a parallel-group design and no blinding, consisting of two intervention groups, each comprising 17 participants. Simple randomization was performed using computer software.

Settings and conduct

All variables will be recorded at baseline, immediately following the intervention, and one hour post-intervention. All therapeutic sessions will be conducted by a trained therapist at a private physiotherapy clinic in Tehran Province, strictly adhering to the standardized protocols for each respective method.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Male non-professional soccer players aged 18–35 years; presence of hamstring muscle flexibility limitations (based on the AKE test); and no receipt of physiotherapy or hamstring stretching exercises within the past two weeks. Exclusion criteria: A history of injury or surgery to the lower extremities; inability to perform the study's tests or interventions for any reason; severe deformities of the back or lower extremities; and the use of medications that affect muscle tone or function.

Intervention groups

MET Group: In a supine position with the hip stabilized at 90° via a sling, the therapist will passively extend the knee to the point of resistance. The participant will then perform a 7–10 second isometric contraction at 75% MVC against the therapist's shoulder. After a 2–3 second rest, the knee will be passively moved to a new range and held for 10 seconds. This cycle will be repeated 3 times. FDM Group: Following the Fascial Distortion Model (FDM), participants will identify pain/stiffness sites during the AKE test. The therapist will apply intense thumb pressure (trigger point technique) along the hamstrings for 3–4 repetitions. The total intervention time is 3–4 minutes per session, with no other interventions applied.

Main outcome variables

AKE test; Modified Sit & Reach test; VAS test; Vertical Jump test

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20260120068620N1**
Registration date: **2026-11-17, 1405/08/26**
Registration timing: **registered_while_recruiting**

Last update: **2026-11-17, 1405/08/26**
Update count: **0**

Registration date

2026-11-17, 1405/08/26

Registrant information

Name

mohammad pazoki

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 21 3602 9988

Email address

pazoki20@gmail.com

Recruitment status

recruiting

Funding source

Expected recruitment start date

2026-11-15, 1405/08/24

Expected recruitment end date

2027-02-13, 1405/11/24

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison of the immediate effect of the fascia distortion model (FDM) and muscle energy technique (MET) on hamstring muscle flexibility in non-professional male athletes

Public title

Comparison of the immediate effect of two manual therapy techniques on back thigh muscle flexibility in male athletes

Purpose

Supportive

Inclusion/Exclusion criteria

Inclusion criteria:

Inability to complete 20 degrees of extension, or exceeding the terminal range of active knee extension (AKE) in the preferred leg Between 18 and 30 years of age Non-professional athletes Presence of pulling or burning pain according to the Trigger Point Distortion Pattern criteria during the AKE test Written informed consent for participation in the study. No use of any physical therapy or stretching techniques for the hamstring muscles within the past 2 weeks.

Exclusion criteria:

Presence of acute or chronic lower-extremity injuries within the past three months. History of surgery involving the lumbar region or lower extremities. Known neurological impairments or neuromuscular disorders, such as peripheral neuropathy, multiple sclerosis (MS), or spinal cord injuries. Presence of severe deformities in the hip, knee, or lumbar spine. Use of medications that affect muscle tone or function, such as muscle relaxants or nonsteroidal anti-inflammatory drugs (NSAIDs), within the past eight weeks. The participant's unwillingness to undergo or continue the test.

Age

From **18 years** old to **30 years** old

Gender

Male

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **34**

Randomization (investigator's opinion)

Randomized

Randomization description

After selecting eligible participants and obtaining their informed consent, each participant will be assigned a unique identification code. Subsequently, a random allocation sequence will be generated using computer software based on the simple randomization method. Participants will then be randomly assigned, with equal probability, to one of the two intervention groups: the Fascial Distortion Model (FDM)-based manual therapy group or the Muscle Energy Technique (MET) group. Group allocation will be carried out according to the random sequence generated by the software.

Blinding (investigator's opinion)

Not blinded

Blinding description

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics Committee of Tehran University of Medical Sciences

Street address

Center of Headquarters of Tehran University of Medical Sciences, 6th Floor, Corner of Qods Ave., Keshavarz Blvd..

City

Tehran

Province

Tehran

Postal code

141765383761

Approval date

2025-12-25, 1404/10/04

Ethics committee reference number

IR.TUMS.FNM.REC.1404.220

Health conditions studied

1

Description of health condition studied

Hamstring muscle flexibility

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description

Knee joint angle measured in the Active Knee Extension (AKE) test using a goniometer (in degrees)

Timepoint

Baseline (after warm-up), immediately after intervention, and one hour after intervention.

Method of measurement
Goniometer

2

Description
Distance traveled in the Modified Sit & Reach test using a Flex Tester Box (in centimeters)
Timepoint
Baseline (after warm-up), immediately after intervention, and one hour after intervention.
Method of measurement
Flex Tester Box

3

Description
Level of pain or discomfort based on the Visual Analogue Scale (VAS) using a 10-cm ruler (score from 0 to 10)
Timepoint
Baseline (after warm-up), immediately after intervention, and one hour after intervention.
Method of measurement
Visual Analogue Scale

4

Description
Net Vertical Jump height measured using the Chalk Method (in centimeters)
Timepoint
Baseline (after warm-up), immediately after intervention, and one hour after intervention.
Method of measurement
Chalk Method

Secondary outcomes

empty

Intervention groups

1

Description
First Intervention Group: This group utilizes the Post Isometric Relaxation (PIR) method based on Lewit's technique. The patient lies supine on the treatment table, and the hip joint is secured at a 90-degree angle using a sling. The therapist extends the patient's knee until the first resistance to movement is felt and the patient reports discomfort or pain. The patient is then instructed to isometrically contract their leg muscles, pushing against the therapist's shoulder with approximately 75% of their maximum voluntary contraction for 7-10 seconds. Following the contraction, the patient relaxes the muscle. After a 2-3 second pause, the therapist passively moves the patient's knee into a new range of extension and holds this position for approximately 10 seconds. This cycle is repeated three times.
Category
Treatment - Other

2

Description
Second Intervention Group: In this group, the therapist performs the Triggerband technique based on the principles of the Fascial Distortion Model (Typaldos classification) and the patient's body language. The therapist applies firm, localized pressure with their thumb along the hamstring muscle. This pressure is applied longitudinally, starting from the medial or lateral popliteal fossa and extending toward the ischial tuberosity. The pressure is maintained on the painful areas until the participant reports a reduction in pain or the resolution of discomfort.
Category
Treatment - Other

Recruitment centers

1

Recruitment center
Name of recruitment center
Mohammad Pazoki Physiotherapy Clinic
Full name of responsible person
Mohammad Pazoki
Street address
No 500, Shamshad 1st Ave, Motahari Blvd
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pazoki20@gmail.com

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Tehran University of Medical Sciences
Full name of responsible person
Ramin Kordi
Street address
Tehran University of Medical Sciences, Ghods Ave., Tehran, Iran
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Province
Tehran
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Phone
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Fax
+98 21 4293 3261
Email

tumspr@tums.ac.ir

Web page address

https://cv.tums.ac.ir/cv/Ramin_Kordi

Grant name

Grant code / Reference number

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

Yes

Title of funding source

Tehran 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

Tehran University of Medical Sciences

Full name of responsible person

Mohammad Pazoki

Position

Student

Latest degree

Bachelor

Other areas of specialty/work

Physiotherapy

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Position

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Other areas of specialty/work

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Person responsible for updating data

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Sharing plan

Deidentified Individual Participant Data Set (IPD)

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

Study Protocol

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

Statistical Analysis Plan

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

Informed Consent Form

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

Clinical Study Report

Undecided - It is not yet known if there will be 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