

Clinical Trial Protocol

Iranian Registry of Clinical Trials

27 Jul 2026

Effects of Foam Rolling on Hamstring Deep Fascia Stiffness, Pressure Pain Threshold, Flexibility and Active Jumping in Amateur Athletes following Delayed Onset Muscle Soreness.

Protocol summary

Study aim

Determining the effect of foam rolling of the hamstring muscle on deep fascial tightness, pressure pain threshold, passive range of motion, and vertical jump in amateur athletes with delayed onset muscle soreness

Design

A controlled, single-blind, randomized, parallel-group clinical trial on 24 amateur athletes. Random numbers written on paper will be used for randomization.

Settings and conduct

This study is conducted on amateur athletes. First, dams are created and then foam rolling is used to perform an intervention on the intervention group. Deep fascial tightness will be assessed before and after the interventions. Blinding in this study is such that the person evaluating the results is different from the person collecting the sample and has no knowledge of the groups.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Healthy amateur athlete, 18 to 35 years old, both sexes, without neurological disorders. Exclusion criteria: Participant's withdrawal from cooperation. Participant's feeling of dissatisfaction.

Intervention groups

The intervention group used foam rolling after performing Nordic exercises. They put their maximum body weight on the foam rolling and slid their body mass along it, starting from the proximal part of the back area at the hamstring muscle, then moving down and gradually moving them towards the knee, and when the foam rolling reached the distal thigh area, it was returned to the initial position. These steps were performed at a rotation speed of 30 rotations per minute and foam rolling was performed in 4 sets of 45 seconds, with a 15-second rest period between sets. In the sessions 24 and 48 hours after the initial Nordic exercises, the intervention group repeated the foam

rolling steps. The control group did not receive foam rolling.

Main outcome variables

Deep fascial stiffness, pressure pain threshold, flexibility, and active jumping

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20250121064460N1**

Registration date: **2025-03-02, 1403/12/12**

Registration timing: **registered_while_recruiting**

Last update: **2025-03-02, 1403/12/12**

Update count: **0**

Registration date

2025-03-02, 1403/12/12

Registrant information

Name

Negin Nateghi

Name of organization / entity

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Iran (Islamic Republic of)

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-02-28, 1403/12/10

Expected recruitment end date

2025-07-01, 1404/04/10

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Effects of Foam Rolling on Hamstring Deep Fascia Stiffness, Pressure Pain Threshold, Flexibility and Active Jumping in Amateur Athletes following Delayed Onset Muscle Soreness.

Public title

The effect of foam rolling on the hamstring muscle

Purpose

Treatment

Inclusion/Exclusion criteria**Inclusion criteria:**

Having a normal BMI Age range between 18-35 years All participants must be of the same sex and there should be no statistically significant difference between the groups in terms of gender Amateur athlete (between 1 and 4 hours of exercise per week). Absence of central and peripheral neurological disorders. Absence of skin conditions in the hamstring muscle area. Absence of joint injuries (capsular, ligamentous, etc.). Absence of immunological diseases or malignancy.

Exclusion criteria:

Participant withdrawal from cooperation. Participant feeling dissatisfied. Participant intolerance to research procedures. Taking anticoagulant medication. Having vascular disease and diabetes.

Age

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

Gender

Both

Phase

N/A

Groups that have been masked

- Outcome assessor

Sample size

Target sample size: **24**

Randomization (investigator's opinion)

Randomized

Randomization description

The sampling method in this study will be available sampling. The samples will be randomly assigned to two groups using the Stratified Permuted Block Randomization method with 6 blocks of 4. In this method, A will represent group one (foam rolling group) and B will represent group two (control group). In this way, the order of interventions A and B in the form of blocks from number 1 to 6 will be determined by the project's methodological consultant and provided to the project's executive supervisor, and the researcher will obtain assignments from the executive supervisor to assign each eligible person. The executive supervisor first selects the block using a table of random numbers, and then the eligible people are assigned to one of the two groups A or B based on the order previously

determined in the table.

Blinding (investigator's opinion)

Single blinded

Blinding description

The outcome assessor will be blinded to the treatment groups.

Placebo

Not used

Assignment

Parallel

Other design features**Secondary Ids**

empty

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

Research Ethics Committees of School of Nursing and Midwifery & Rehabilitation - Tehran University o

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School of Rehabilitation of Tehran University of MedicalSciences, Piche Shemiran, Enghelab Ave, Tehran, Iran

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Approval date

2025-01-08, 1403/10/19

Ethics committee reference number

IR.TUMS.FNM.REC.1403.186

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

Delayed Onset Muscle Soreness

ICD-10 code

M62.9

ICD-10 code description

Disorder of muscle, unspecified

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

Deep Fascia Stiffness

Timepoint

Before the intervention, before, 24 hours after, and 72 hours after the intervention

Method of measurement

Shear Wave Elastography (SWE) Results

Secondary outcomes

1

Description

Pressure Pain Threshold

Timepoint

Before the intervention, before, 24 hours after, and 72 hours after the intervention

Method of measurement

Algometer

2

Description

flexibility

Timepoint

Before the intervention, before, 24 hours after, and 72 hours after the intervention

Method of measurement

Goniometer

3

Description

Active Jumping

Timepoint

Before the intervention, before, 24 hours after, and 72 hours after the intervention

Method of measurement

Vertical jump test

Intervention groups

1

Description

Intervention group: First, the variables are assessed and then the participants will perform the desired eccentric exercises. Based on the protocol mentioned in the Mendiguchia et al (2020) study, Nordic hamstring exercise involves eccentric contractions and will cause muscle pain. Nordic exercise consists of 5 sets of 8 repetitions, with 10 seconds of rest between repetitions and 2 to 3 seconds of rest between sets. After performing Nordic exercises, they used a foam roller. In this way, they put their maximum body weight on the foam roller and slid their body mass along it, starting from the proximal part of the back area at the hamstring muscle, then moving down and gradually moving them towards the knee, and when the foam rolling reached the distal thigh area, they returned it to the initial position. These steps were performed at a rotation speed of 30 revolutions per minute and foam rolling was performed in 4 sets of 45 seconds, with a 15-second rest between sets. In the second and third sessions, which will be 24 and 48 hours after the initial Nordic exercises, the foam rolling steps will be repeated. In order to follow up on the effect 72 hours after the Nordic exercises, a final evaluation of the variables will be performed. The evaluation and performance of the ultrasound test with shear wave was performed in collaboration with a

radiologist, and the results of the evaluation before, after the first session, and 72 hours after the exercises will be recorded. The evaluation of the pressure pain and jump length variables will be performed by the first researcher in an environment close to the ultrasound location.

Category

Rehabilitation

2

Description

Control group: First, the variables will be evaluated and then the participants will perform the desired eccentric exercises. Based on the protocol mentioned in the Mendiguchia et al (2020) study, the Nordic hamstring exercise will include eccentric contractions and will cause muscle pain. The Nordic exercise will consist of 5 sets of 8 repetitions, with 10 seconds of rest between repetitions and 2 to 3 seconds of rest between sets. In the first session, the control group will not receive treatment after performing the exercises. In order to follow up on the effect 72 hours after performing the Nordic exercises, a final evaluation of the variables will be performed. The evaluation and performance of the ultrasound test with shear wave will be performed in collaboration with a radiologist and the results of the evaluation before, after the first session and 72 hours after the exercises will be recorded. The evaluation of the pressure pain variables and jump length will be performed by the first researcher in an environment close to the ultrasound location.

Category

Other

Recruitment centers

1

Recruitment center

Name of recruitment center

کلینیک فیزیوتراپی دانشگاه تهران

Full name of responsible person

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

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Web page address

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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

Negin Nateghi

Position

Master's student

Latest degree

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Other areas of specialty/work

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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