Clinical Trial Protocol
Iranian Registry of Clinical Trials

10 Jun 2026

Effects of Foam Rolling on Hamstring Deep Fascia Stiffness, Pressure Pain Threshold, Flexibility and Active Jumping in Ameutre 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

Country

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 Ameutre 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
Street address
School of Rehabilitation of Tehran University of MedicalSciences, Piche Shemiran, Enghelab Ave, Tehran, Iran
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Tehran
Postal code
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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
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Sponsors / Funding sources

1

Sponsor
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Web page address
https://vcr.tums.ac.ir/about
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

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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