

Clinical Trial Protocol

Iranian Registry of Clinical Trials

12 Oct 2026

Acute, chronic, and detraining effects of dynamic stretching and tissue flossing on muscle function, sprint performance, balance, and proprioception, in soccer players with hamstring shortness: a three-arm parallel randomized controlled trial protocol

Protocol summary

Study aim

To investigate the acute, chronic, and detraining effects of dynamic stretching and tissue flossing on muscle function, sprint performance, balance, and proprioception in soccer players with hamstring shortness

Design

a three-arm parallel randomized controlled trial with a computer-generated random sequence

Settings and conduct

This study will be conducted in sports sciences in Qazvin, with participants randomly assigned to one of three groups: dynamic stretching, tissue flossing, or control. Assessments will occur in four phases: pre-test, immediately after the first session, after six weeks of training, and after three weeks of detraining.

Participants/Inclusion and exclusion criteria

Inclusion Criteria: (1) Male amateur soccer players (who play in local leagues without a financial contract) aged 14 to 17 years; (2) Minimum of 3 years of continuous soccer participation within organized soccer clubs; (3) Clinically diagnosed with hamstring shortness, defined as a score of more than 33 degrees on the active knee extension test; (4) No prohibition on using dynamic stretching or tissue flossing, with the approval of a medical professional. Exclusion Criteria: (1) Lower limb injuries during the study; (2) Inability to commit to the full study duration and prescribed protocols, including more than two consecutive or three total absences.

Intervention groups

Three groups will participate: the flossing group, which uses a floss band with active movements; the dynamic stretching group; and the control group. All sessions will begin with a standardized warm-up.

Main outcome variables

Knee extension range of motion Hip flexion range of

motion Hamstring and quadriceps strength Muscle power
Sprint performance Dynamic balance Knee joint
repositioning error

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20251202068197N1**

Registration date: **2025-12-05, 1404/09/14**

Registration timing: **prospective**

Last update: **2025-12-05, 1404/09/14**

Update count: **0**

Registration date

2025-12-05, 1404/09/14

Registrant information

Name

Mohammad Alghosi

Name of organization / entity

The University of Guilan

Country

Iran (Islamic Republic of)

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Email address

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-12-10, 1404/09/19

Expected recruitment end date

2025-12-30, 1404/10/09

Actual recruitment start date
empty

Actual recruitment end date
empty

Trial completion date
empty

Scientific title
Acute, chronic, and detraining effects of dynamic stretching and tissue flossing on muscle function, sprint performance, balance, and proprioception, in soccer players with hamstring shortness: a three-arm parallel randomized controlled trial protocol

Public title
Effects of dynamic stretching and tissue flossing on muscle function, sprint performance, balance, and proprioception in soccer players with hamstring shortness

Purpose
Supportive

Inclusion/Exclusion criteria
Inclusion criteria:
Male amateur soccer players (who play in local leagues without a financial contract) aged 14 to 17 years
Minimum of 3 years of continuous soccer participation within organized soccer clubs
Clinically diagnosed with hamstring shortness, defined as a score of more than 33 degrees on the active knee extension test
No prohibition on using dynamic stretching or tissue flossing, with the approval of a medical professional
Exclusion criteria:
Lower limb injuries during the study
Inability to commit to the full study duration and prescribed protocols, including more than two consecutive or three total absences

Age
From **14 years** old to **17 years** old

Gender
Male

Phase
N/A

Groups that have been masked
No information

Sample size
Target sample size: **57**

Randomization (investigator's opinion)
Randomized

Randomization description
Eligible participants will be randomly assigned to one of three groups, including a dynamic stretching group, a tissue flossing group, or a control group, using a computer-generated randomization sequence from <https://www.randomizer.org>. The randomization list is securely stored on a password-protected computer, accessible only to the researcher responsible for participant allocation. Recruitment staff and others will not have access to this information.

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
Research Ethics Committees of University of Guilan
Street address
5th Kilometer of Persian Gulf Highway, Rasht, Guilan Province, Iran
City
Rasht
Province
Guilan
Postal code
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Approval date
2025-12-01, 1404/09/10

Ethics committee reference number
IR.GUILAN.REC.1404.149

Health conditions studied

1

Description of health condition studied
Limited knee range of motion

ICD-10 code
M25.6

ICD-10 code description
Stiffness of joint, not elsewhere classified

Primary outcomes

1

Description
In the current study, hamstring shortness, knee range of motion, hamstring flexibility, muscle strength, muscle power, sprint performance, dynamic balance, and joint position sense are being investigated.

Timepoint
Baseline, Acute effect measurement (after the first session), Chronic effect measurement (after 6 weeks of training), and Follow-up measurement (after 3 weeks of detraining)

Method of measurement
The following outcome measures will be assessed using the corresponding tests: hamstring shortness and knee range of motion via the active knee extension test; hamstring flexibility via the active straight leg raise test; muscle strength (isometric and eccentric hamstring,

isometric quadriceps) using a handheld dynamometer; lower-body muscle power via the countermovement jump test; sprint performance using the MySprint app protocol; dynamic balance via the Y-Balance test; and knee joint proprioception via a joint position sense test.

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: Participants assigned to the tissue flossing group will undergo floss band application, which will be anchored just above the distal third of the thigh between the anterior superior iliac spine and the patella. The band will be applied in a spiral pattern from distal to proximal, maintaining 50% tension and 50% overlap between layers, and will remain continuously applied throughout each session without removal between sets. The Tissue Flossing Group will follow a 6-week progressive protocol. Weeks 1–2 involved 2 sets of 15 repetitions of two exercises (Active leg swings and Active standing toe touches), which will be performed three times per week. Weeks 3–4 progressed to 3 sets of 20 repetitions of Active leg swings and Dynamic standing hamstring stretches, also three times weekly. Weeks 5–6 involved 4 sets of 20 repetitions of Active leg swings and standing hamstring scoop exercises, which will be performed four times per week.

Category

Rehabilitation

2

Description

Intervention group: The Dynamic Stretching Group will complete a separate 6-week progressive protocol. Weeks 1–2 will involve 3 sets of 15 repetitions of Active leg swings and Lunges with eccentric hamstring windmills, to be performed three times per week at a controlled end-range. Weeks 3–4 will increase to 4 sets of 20 repetitions with a slightly increased range of motion. Weeks 5–6 will involve 5 sets of 20 repetitions, with further increased range and speed, to be performed four times per week. For both groups, exercises will be performed at a moderate tempo, 3 seconds per repetition (2-second eccentric, 1-second concentric), synchronized to a metronome at 60 BPM, with a 20-second rest interval between sets. All protocols will be conducted in the morning (10–12 AM) during the pre-competition active phase, with exercises performed bilaterally.

Category

Rehabilitation

3

Description

Control group: The control group received no other intervention, except for the same warm-up as the other

groups.

Category

Other

Recruitment centers

1

Recruitment center

Name of recruitment center

Faculty of Physical Education and Sports Sciences, University of Guilan Complex, Persian Gulf Highway

Full name of responsible person

Mohammad Alghosi

Street address

Faculty of Physical Education and Sports Persian Gulf Highway (Km. 5 of Rasht-Qazvin Road), Rasht, Iran.

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

University of Guilan

Full name of responsible person

Hassan Daneshmandi

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Grant name

Grant code / Reference number

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

No

Title of funding source

University of Guilan

Proportion provided by this source

1

Public or private sector

Private

Domestic or foreign origin

Domestic

Category of foreign source of funding

empty

Country of origin**Type of organization providing the funding**

Persons

Person responsible for general inquiries**Contact****Name of organization / entity**

University of Guilan

Full name of responsible person

Hassan Daneshmandi

Position

Professor

Latest degree

Ph.D.

Other areas of specialty/work

Sport Science

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Faculty of Physical Education and Sports Sciences,
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Person responsible for updating data**Contact****Name of organization / entity**

University of Guilan

Full name of responsible person

Mohammad Alghosi

Position

PhD student

Latest degree

Master

Other areas of specialty/work

Sport Science

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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

Undecided - It is not yet known if there will be 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

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

Data Dictionary

Not applicable

Title and more details about the data/document

Some of the images used in the study will be corrupted.

When the data will become available and for how long

From 01/03/2026 to 6 months later

To whom data/document is available

Researcher

Under which criteria data/document could be used

An official email should be used to contact the corresponding author.

From where data/document is obtainable

corresponding author.

What processes are involved for a request to access**Person responsible for scientific inquiries****Contact****Name of organization / entity**

University of Guilan

Full name of responsible person

Mohammad Alghosi

Position

PhD student

Latest degree

Master

Other areas of specialty/work

Sport Science

Street address

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data/document

official email
Comments