Clinical Trial Protocol
Iranian Registry of Clinical Trials

07 Nov 2026

Immediate effects of plyometric depth drop jump and landing exercise with and without blood flow restriction on neuromuscular control and cognitive function in sprinters

Protocol summary

Study aim

Immediate effects of plyometric depth drop jump and landing exercise with and without blood flow restriction on neuromuscular control and cognitive function in sprinters.

Design

A randomized, single-blind, parallel-group, controlled clinical trial on 27 male sprinters. Sealed envelopes with the name of each group written inside them are used for randomization.

Settings and conduct

Qualified individuals will be randomly assigned to groups. To blind the participants, their time will be different. Initial assessment is performed by computerized cognitive tests, single leg hop and triple hop, Edgren's side step test, and knee valgus angle during landing from a countermovement jump. After warm up, the control group performs two sets of eight depth drop jump landing exercises with the device turned off. The intervention group performs the same exercise with a blood flow restriction device at 40% occlusion pressure. Final assessment is performed after a 5-minute rest.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Semi-professional male sprinters aged 18 to 30 Participating in sprint training at least 3 sessions per week No history of cardiovascular disease, diabetes or musculoskeletal injury No alcohol or caffeine consumption 24 hours prior to the study No heavy exercise 72 hours prior to the study Exclusion criteria: Recent injuries (last 6 months) in the lower extremities Self-reported not semi-professional activity Unwillingness to continue the research process

Intervention groups

The study groups include a control and an intervention group. In the control group, the intervention is plyometric depth drop jump and landing exercise. In the intervention group, plyometric depth drop jump and landing exercise is applied simultaneously with a blood flow restriction device.

Main outcome variables

neuromuscular function (Dynamic knee valgus)

General information

Reason for update

During the initial registration in the IRCT system, the estimated start and end dates for sampling were recorded as 1404/03/01 and 1404/06/01, respectively; however, the final approval and registration of the study in IRCT was completed on 1404/06/02. Notably, the actual sampling period for this research spanned from mid-Khordad to late-Shahrivar 1404. Consequently, unless the actual sampling dates are updated and entered into the system, it would erroneously appear that sampling commenced prior to the final IRCT registration, whereas this discrepancy merely reflects the difference between the initial estimated timeline, the final approval date, and the actual execution period of the study.

Acronym

IRCT registration information

IRCT registration number: **IRCT20250424065462N1**
Registration date: **2025-08-24, 1404/06/02**
Registration timing: **prospective**

Last update: **2026-08-27, 1405/06/05**
Update count: **1**

Registration date

2025-08-24, 1404/06/02

Registrant information

Name

Samira Ebrahimi

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone
+98 26 3447 9916
Email address
samiraphysio2000@gmail.com

Recruitment status
Recruitment complete
Funding source

Expected recruitment start date
2025-09-05, 1404/06/14
Expected recruitment end date
2025-12-13, 1404/09/22
Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Immediate effects of plyometric depth drop jump and landing exercise with and without blood flow restriction on neuromuscular control and cognitive function in sprinters

Public title
Effect of blood flow restriction on the performance of sprinters
Purpose
Supportive
Inclusion/Exclusion criteria
Inclusion criteria:
Semi-professional male sprinters aged 18 to 30 years Participating in sprint training at least 3 sessions per week No history of cardiovascular disease or diabetes No history of musculoskeletal injury within the past 6 months No alcohol or caffeine consumption 24 hours prior to the study No heavy training within 72 hours prior to the study
Exclusion criteria:
Presence of recent injuries (last 6 months) in the lower extremities Individual's self-report of non semi-professional activity
Age
From **18 years** old to **30 years** old
Gender
Male

Phase
N/A
Groups that have been masked

- Participant

Sample size
Target sample size: **27**
Randomization (investigator's opinion)
Randomized
Randomization description
Sealed envelopes are prepared corresponding to the number of participants. Half of the envelopes are labeled 'Control - Plyometric,' while the other half are labeled 'Plyometric and Blood Flow Restriction.' Each participant selects an envelope at random from the two groups without viewing its contents.
Blinding (investigator's opinion)
Single blinded
Blinding description
Participants will not be aware of their group. They will not participate on the same day and time. In both intervention and control groups, the cuff of the blood flow restriction device is closed in the proximal of lower limb. In the intervention group, the cuff pressure is measured and adjusted to the desired level, but in the control group, the cuff remains empty and is used to eliminate the placebo effect.
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
No. 21, Dr. Mirkhani St. (Neshat Sharghi), Tohid Square, Tehran, Iran
City
tehran
Province
Tehran
Postal code
1148965111
Approval date
2025-03-21, 1404/01/01
Ethics committee reference number
IR.TUMS.FNM.REC.1404.027

Health conditions studied

1

Description of health condition studied
Healthy male sprinters
ICD-10 code
ICD-10 code description

Primary outcomes

1

Description
knee dynamic valgus angle
Timepoint
Measurement of dynamic knee valgus angle at the

beginning of the study, and 5 minutes rest after the intervention

Method of measurement

kinovea software

Secondary outcomes

1

Description

Cognitive function

Timepoint

Beginning of the study and 5 minutes after intervention

Method of measurement

Reaction time

2

Description

single leg hop for distance

Timepoint

Beginning of the study and 5 minutes after intervention

Method of measurement

meter

3

Description

Agility

Timepoint

Beginning of the study and 5 minutes after intervention

Method of measurement

Edgren side step test

Intervention groups

1

Description

Intervention Group :The cuff of the device is placed on the proximal thigh of both limbs, and the cuff pressure is inflated to 40% of the arterial occlusion pressure. Then, the participant performs drop jump exercises from a height of 15 centimeters for two sets of 8 repetitions, resting for 3 minutes between each set.

Category

Rehabilitation

2

Description

Control Group :The cuff of the device is placed on the proximal thigh of both limbs, but the cuff is not inflated. Then, the participant performs drop jump exercises from a height of 15 centimeters for two sets of 8 repetitions, resting for 3 minutes between each set.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Rehabilitation school of Tehran University of Medical Sciencesedical Sciences

Full name of responsible person

Samira Ebrahimi

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Tehran, District 12, Enghelab St، Pich-e-Shemiran

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Tehran University of Medical Sciences

Full name of responsible person

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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
Samira Ebrahimi

Position
Candidate of sports physiotherapy master degree

Latest degree
Bachelor

Other areas of specialty/work
Physiotherapy

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Person responsible for scientific inquiries

Contact

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Full name of responsible person
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Position
Candidate of sports physiotherapy master degree

Latest degree
Bachelor

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Person responsible for updating data

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Sharing plan

Deidentified Individual Participant Data Set (IPD)
No - There is not a plan to make this available

Justification/reason for indecision/not sharing IPD
Participants' data will remain confidential.

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

Statistical Analysis Plan
No - There is not 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
No - There is not a plan to make this available

Analytic Code
Not applicable

Data Dictionary
Not applicable