

Clinical Trial Protocol

Iranian Registry of Clinical Trials

10 Jun 2026

Acute effects of beetroot juice supplementation on the Special Judo Fitness Test performance in judokas: a randomized double-blinded crossover trial

Protocol summary

Study aim

This study aims to evaluate the effect of training status on the Special Judo Fitness Test (SJFT) performance following beetroot juice ingestion.

Design

A crossover, placebo-controlled, double-blind, randomized, phase 3 clinical trial on 34 judo athletes. The RAND function of Excel software will be used for randomization.

Settings and conduct

Participants will perform two sessions of SJFT after beetroot or placebo supplementation. The number of throws (TT), heart rate (HR) immediately at the end of SJFT (HR0) and 1 minute after SJFT (HR1), SJFT index, rate of perceived exertion (RPE), muscle oxygenation, and plasma nitrate, nitrite and lactate levels will be measured. This study will use a double-blind method (participants and researchers). The study will take place in Ankara, Turkey.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Having at least a Purple Belt in Judo
Free from neuromuscular and musculoskeletal disorders
Non-smokers Non-alcoholic Not consumers of medicine
Exclusion criteria: Having any injuries or pain Inability to perform tests Non-adherence to recommendations

Intervention groups

Consuming beetroot juice supplement (140 ml) or placebo (140 ml of nitrate-depleted beetroot juice) 120 minutes before exercise sessions

Main outcome variables

Number of throws; Heart rate immediately after SJFT; Heart rate one minute after SJFT; SJFT index; Rate of perceived exertion

General information

Reason for update

Adding some secondary variables to evaluate possible mechanisms; Adding subjects number to enhance statistical analysis power; Using nitrate-depleted beetroot juice as a placebo to enhancing blinding effect.

Acronym

IRCT registration information

IRCT registration number: **IRCT20231004059615N3**

Registration date: **2025-05-22, 1404/03/01**

Registration timing: **registered_while_recruiting**

Last update: **2026-04-07, 1405/01/18**

Update count: **1**

Registration date

2025-05-22, 1404/03/01

Registrant information

Name

Davar Khodadadi

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 21 2263 3583

Email address

davar.khodadadi@yahoo.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-05-22, 1404/03/01

Expected recruitment end date

2025-05-31, 1404/03/10

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Acute effects of beetroot juice supplementation on the Special Judo Fitness Test performance in judokas: a randomized double-blinded crossover trial

Public title

Acute effects of beetroot juice supplementation on judo performance

Purpose

Other

Inclusion/Exclusion criteria

Inclusion criteria:

Having at least a Purple Belt in Judo Free from neuromuscular and musculoskeletal disorders Non-smokers Non-alcoholic Not consumers of medicine

Exclusion criteria:

Having any injuries or pain Inability to perform tests

Age

From **20 years** old to **30 years** old

Gender

Both

Phase

3

Groups that have been masked

- Participant
- Investigator
- Outcome assessor
- Data analyser

Sample size

Target sample size: **34**

Randomization (investigator's opinion)

Randomized

Randomization description

The names of the subjects will be entered in one column of Excel; in another column, a number will be randomly assigned to each subject using the RAND function (=RAND()); then, the numbers will be sorted from smallest to largest; 50% of the subjects (from rows 1 to 8) will receive the supplement and the other 50% (from rows 9 to 16) will receive the placebo. In the second experimental session, the subjects will be switched (subjects who received the supplement in the first session will receive the placebo in the second session and vice versa).

Blinding (investigator's opinion)

Double blinded

Blinding description

The order of beetroot juice supplement or placebo intake will be determined randomly by a person outside the study, and participants and researchers will not be informed of it until after data analysis. Also, subjects will receive the supplement and placebo in an opaque container with a similar appearance. In addition, the color and taste of the placebo will be similar to the beetroot juice through the addition of food coloring and flavoring.

Placebo

Used

Assignment

Crossover

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics Committee of the International Science and Technology University

Street address

Tunahan Mah. Dumlupinar 30 Agustos Cad. No:2, Metromal Business F Blok Office

City

Ankara

Postal code

21,06824

Approval date

2025-05-14, 1404/02/24

Ethics committee reference number

202505-03

Health conditions studied

1

Description of health condition studied

Improve exercise performance

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description

SJFT index

Timepoint

After SJFT

Method of measurement

Using the following formula: $SJFT\ index = HR0 + HR1 / \text{total number of throws}$

Secondary outcomes

1

Description

Rate of perceived exertion

Timepoint

Following SJFT

Method of measurement

Using the Borg scale

2

Description

Number of throws

Timepoint

During the SJFT

Method of measurement

Counting the number

3

Description

Heart rate

Timepoint

Immediately at the end of SJFT and 1 minute after SJFT

Method of measurement

Using a Polar heart rate monitor

4

Description

Plasma nitrate concentration

Timepoint

At baseline, pre-test, and post-test (5 minutes after exercise)

Method of measurement

By high-performance liquid chromatography method (ENO-20; EiCom, Kyoto, Japan)

5

Description

Plasma nitrite concentration

Timepoint

At baseline, pre-test, and post-test (5 minutes after exercise)

Method of measurement

By high-performance liquid chromatography method (ENO-20; EiCom, Kyoto, Japan)

6

Description

Plasmalactate

Timepoint

At baseline, pre-test, and post-test (5 minutes after exercise)

Method of measurement

Using a lactate ELISA kit

7

Description

Muscle oxygenation

Timepoint

During the SJFT

Method of measurement

Near-infrared spectroscopy

Intervention groups

1

Description

Intervention group: Beetroot juice supplement (140 ml, containing approximately 12.8 mmol nitrate) in opaque bottles will be consumed 2 hours before exercise. Commercial beetroot juice supplement (BEET It Sport®; James White Drinks Ltd., Ipswich, UK) will be used in this study.

Category

Rehabilitation

2

Description

Placebo (140 ml) will be consumed 2 hours before exercise in opaque bottles. Commercial nitrate-depleted beetroot juice supplement (NO₃⁻-depleted BJ, Beet It Sport®, James White Drinks Ltd., UK) will be used in this study.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

INTERNATIONAL SCIENCE AND TECHNOLOGY UNIVERSITY

Full name of responsible person

Heidar Sajedi

Street address

Tunahan Mah. Dumlupinar 30 Agustos Cad. No:2, Metromal Business F Blok Office

City

Ankara

Postal code

21,06824

Phone

+90 312 475 76 15

Email

heidar.sajedi@istu.edu.pl

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

INTERNATIONAL SCIENCE AND TECHNOLOGY UNIVERSITY

Full name of responsible person

Erdal Dursun

Street address

Tunahan Mah., Dumlupinar 30 Agustos Cad. No. 2, Metromal Business F Blok Office

City

Ankara

Postal code

21,06824

Phone

+90 312 475 76 15

Email

heidar.sajedi@istu.edu.pl

Grant name**Grant code / Reference number****Is the source of funding the same sponsor organization/entity?**

Yes

Title of funding source

INTERNATIONAL SCIENCE AND TECHNOLOGY UNIVERSITY

Proportion provided by this source

100

Public or private sector

Private

Domestic or foreign origin

Foreign

Category of foreign source of funding

Sponsor: country of origin

Country of origin

Ir

Type of organization providing the funding

Persons

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

Islamic Azad University

Full name of responsible person

Davar Khodadadi

Position

Assistant professor

Latest degree

Ph.D.

Other areas of specialty/work

Physiology

Street address

Faculty of Physical Education and Sports Sciences,
Velayat University Complex, Shahid Sohani St.,
Sohank

City

Tehran

Province

Tehran

Postal code

1955847781

Phone

+98 21 2263 3583

Fax**Email**

davar.khodadadi@yahoo.com

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

Islamic Azad University

Full name of responsible person

Davar Khodadadi

Position

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Fax**Email**

davar.khodadadi@yahoo.com

Person responsible for updating data**Contact****Name of organization / entity**

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Full name of responsible person

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Tehran

Postal code

1955847781

Phone

+98 21 2263 3583

Fax**Email**

davar.khodadadi@yahoo.com

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

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

Clinical Study Report

Not applicable

Analytic Code

Not applicable

Data Dictionary

Not applicable

Title and more details about the data/document

All data collected during the study will be shareable after de-identifying the subjects.

When the data will become available and for how long

The data will be published after the extracted articles are accepted.

To whom data/document is available

All people

Under which criteria data/document could be used

All data collected during the study will be shareable after de-identifying the subjects. The requester will only be permitted to use the data for meta-analysis reviews.

From where data/document is obtainable

Corresponding author: Davar Khodadadi, Faculty of Physical Education and Sports Sciences, Islamic Azad University Central Tehran Branch, Tehran, Iran Email: davar.khodadadi@yahoo.com

What processes are involved for a request to access data/document

Sending an email request to the corresponding author: Davar Khodadadi Email: davar.khodadadi@yahoo.com

Comments