Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 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
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Iran (Islamic Republic of)
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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

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

City
Ankara

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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 / 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 (NO_3^--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
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Sponsors / Funding sources

1

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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
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

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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
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