

Clinical Trial Protocol

Iranian Registry of Clinical Trials

27 Jul 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)

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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	
<u>1</u>	
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	
<u>1</u>	
Description of health condition studied	Improve exercise performance
ICD-10 code	
ICD-10 code description	
Primary outcomes	
<u>1</u>	
Description	SJFT index
Timepoint	After SJFT
Method of measurement	Using the following formula: $SJFT\ index = HR0 + HR1 / \text{total number of throws}$
Secondary outcomes	
<u>1</u>	
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

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Sponsors / Funding sources

1

Sponsor

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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