Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

The Effect of Simultaneous Red Grape and Beetroot Extract Supplementation Prior to Exercise-Induced Muscle Damage on Muscle Soreness, Strength, and Power Performance Metrics in female Volleyball Players

Protocol summary

Study aim
to investigate the effect of co_ingestion of grape and red beetroot extract before an exercise-induced muscle damage session on DOMS indices and recovery of strength and power performance in female volleyball players

Design
The clinical trial was conducted as a randomized, crossover, placebo-controlled, and double-blind study on 12 patients. Randomization was performed in a simple manner using a number table.

Settings and conduct
The present study, in the form of a randomized, double-blind, crossover clinical trial, investigated the effect of red grape, red beetroot, and their combination (BGE) supplements compared to placebo (PLA) on performance and delayed onset muscle soreness (DOMS) in 12 female volleyball players after performing a traumatic protocol of 200 vertical jumps. Subjects consumed the supplements 2 hours before activity in four stages with a 6-day interval (cleaning period). Performance variables (jumping, agility, strength, flexibility, and muscular endurance) and DOMS (at intervals of 0 to 72 hours after training) were evaluated, and data were analyzed using parametric and nonparametric statistical tests.

Participants/Inclusion and exclusion criteria
Entry criteria: Girls aged 18-30, continuous volleyball training for at least six months, Completed an informed consent form Exclusion criteria: Sports ban, Allergy to beetroot and red grapes, Chronic diseases, Previous injury, Use of dietary supplements, antibiotics and steroids or non-steroidal anti-inflammatory drugs one week before and during the study

Intervention groups
Control conditions (PLA), placebo and red grape extract (RGE), placebo and red beetroot extract (BRE), and grape and red beetroot extract (BGE)

Main outcome variables
Lower body flexibility Lowerand upper body explosive power Lower body isometric strength Agility Speed Abdominal muscular endurance Delayed muscle soreness

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20260818070716N1**
Registration date: **2026-10-02, 1405/07/10**
Registration timing: **prospective**

Last update: **2026-10-02, 1405/07/10**
Update count: **0**

Registration date
2026-10-02, 1405/07/10

Registrant information

Name
Kimia Hajizadegan
Name of organization / entity
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Recruitment status
recruiting

Funding source

Expected recruitment start date
2026-10-04, 1405/07/12
Expected recruitment end date
2026-11-03, 1405/08/12
Actual recruitment start date
2026-10-07, 1405/07/15
Actual recruitment end date
2026-12-03, 1405/09/12
Trial completion date
2026-12-21, 1405/09/30

Scientific title
The Effect of Simultaneous Red Grape and Beetroot Extract Supplementation Prior to Exercise-Induced Muscle Damage on Muscle Soreness, Strength, and Power Performance Metrics in female Volleyball Players

Public title
The effects of red grape extract and beetroot extract on sports performance
Purpose
Basic scienece
Inclusion/Exclusion criteria
Inclusion criteria:
Girls aged 18-30- People who have had continuous volleyball training for at least six months. Completed an informed consent form to participate in the research
Exclusion criteria:
Sports prohibition (complete the questionnaire (PAR-Q)) Allergy to beetroot and red grapes Chronic diseases Previous injury Smoking and alcohol Use of nutritional supplements, use of antibiotics and steroids or non-steroidal anti-inflammatory drugs one week before and during the study
Age
From **18 years** old to **30 years** old
Gender
Female

Phase
3
Groups that have been masked

- Participant
- Investigator

Sample size
Target sample size: **16**
Actual sample size reached: **12**
Randomization (investigator's opinion)
Randomized
Randomization description
Participants were allocated to the intervention and control groups using individual simple randomization based on a random number table. After eligible participants had been enrolled and assigned a unique identification code, the random number table was used for group allocation. The numbers in the table were read sequentially from a predefined starting point, and, according to a prespecified allocation rule, participants were assigned to either the intervention or control group, such that each participant was allocated to only one group. The allocation procedure was continued until the required sample size was reached. Group allocation was performed after eligibility had been confirmed, and the allocation result was recorded for each participant.
Blinding (investigator's opinion)
Double blinded
Blinding description
Before the start of the test, based on a table prepared by a third party (other than the researcher), each subject was randomly assigned to one of the following conditions: 1-control (placebo), 2-placebo and grape extract, 3-placebo and red beet extract, and 4-grape extract and red beet extract. The researcher and the subjects were not informed of the contents of the table until the end of the test. The selection of supplement and placebo capsules was determined and noted by someone other than the researcher.
Placebo
Used
Assignment
Crossover
Other design features

Secondary Ids

1

Registry name
Secondary trial Id
Registration date
empty

Ethics committees

1

Ethics committee
Name of ethics committee
Ethics committee of Shiraz University
Street address
Eram Blvd, Eram Square
City
Shiraz
Province
Fars
Postal code
7194684334
Approval date
2026-04-21, 1405/02/01
Ethics committee reference number
IR.US.PSYEDU.REC.1405.018

Health conditions studied

1

Description of health condition studied
Delayed onset muscle soreness, muscle damage, sports performance
ICD-10 code
ICD-10 code description

Primary outcomes

1

Description
Lower body flexibility
Timepoint
Before the intervention and 72 hours after the intervention and exercise-induced muscle soreness
Method of measurement
V-sit and reach test

2

Description
lower body explosive power
Timepoint
Before the intervention and 72 hours after the intervention and exercise-induced muscle soreness
Method of measurement
Sargent jump test

3

Description
upper body explosive power
Timepoint
Before the intervention and 72 hours after the intervention and exercise-induced muscle soreness
Method of measurement
Medicine ball throw from behind the head

4

Description
lower body isometric strength
Timepoint
Before the intervention and 72 hours after the intervention and exercise-induced muscle soreness
Method of measurement
Wall-sit test

5

Description
agility
Timepoint
Before the intervention and 72 hours after the intervention and exercise-induced muscle soreness
Method of measurement
T-agility test

6

Description
speed
Timepoint
Before the intervention and 72 hours after the intervention and exercise-induced muscle soreness
Method of measurement
10- meters speed test

7

Description
abdominal muscle endurance
Timepoint
Before the intervention and 72 hours after the intervention and exercise-induced muscle soreness
Method of measurement
Sit-up test

8

Description
delayed onset muscle soreness
Timepoint
Before the intervention and 0, 12, 24, 48 and 72 hours after the exhausting session and the intervention
Method of measurement
Visual analogue scale

Secondary outcomes

1

Description
No
Timepoint
No
Method of measurement
No

Intervention groups

1

Description
Intervention group: beetroot extract
Category
Other

2

Description
Intervention group: red grape extract
Category
Other

3

Description
Intervention group: red grape and beetroot extract
Category
Other

4

Description
Control group: placebo
Category
Placebo

Recruitment centers

1

Recruitment center

Name of recruitment center
No
Full name of responsible person
Kimia Hajizadegan
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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
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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
No
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
Shiraz University
Full name of responsible person
Mohammed Hemmatinafar
Position
Assistant professor
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Person responsible for updating data

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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
Yes - There is 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
No - There is not a plan to make this available
Data Dictionary
No - There is not a plan to make this available
Title and more details about the data/document
Demographic characteristics and results related to main outcomes
When the data will become available and for how long
Access period starts from October 1405.
To whom data/document is available
Researchers working in scientific and academic institutions
Under which criteria data/document could be used
No
From where data/document is obtainable
Dr. Mohammed Hemmatinafar
What processes are involved for a request to access data/document
After approval by the supervisor, if the conditions are met, it will be sent within one month.
Comments