Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

The Effect of Six Weeks of Sprint Exercise Snacks on Cardiometabolic Health and Cardiorespiratory Fitness in Inactive Overweight and Obese Female University Students: A Randomized Controlled Trial

Protocol summary

Study aim

The primary objective is to investigate the effect of six weeks of sprint exercise snacks on cardiometabolic health and cardiorespiratory fitness in inactive overweight and obese female university students.

Design

A randomized controlled trial with a parallel two-arm design (intervention and control) on 44 inactive overweight and obese female students. Block randomization is performed using statistical software, with allocation concealment via sealed opaque envelopes. Outcome assessors and the data analyst are blinded.

Settings and conduct

At the Al-Zahra Female Dormitory of Farhangian University, Zanjan. Outcome assessors and the data analyst are blinded.

Participants/Inclusion and exclusion criteria

Inactive female university students aged 19–26 years, residing in the dormitory of Farhangian University of Zanjan, with BMI 24.9–34.9 and physical activity <600 MET-min/week, no medical contraindication for vigorous activity, no known cardiovascular, metabolic, or neuromuscular diseases, providing written informed consent. Exclusion criteria: pregnancy or lactation, active cardiovascular or musculoskeletal disease preventing vigorous activity, use of metabolism-affecting medications, smoking and alcohol consumption, regular exercise program within 3 months prior, and acute illness at screening.

Intervention groups

Intervention group (n=22): A 6-week sprint exercise snack protocol, 3 non-consecutive days/week. Control group (n=22): Maintaining usual lifestyle.

Main outcome variables

Cardiorespiratory fitness; Body fat percentage Waist circumference; Waist-to-height ratio; Blood lipid profile; Systolic and diastolic blood pressure; Fasting blood glucose; Insulin resistance index

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20171205037759N2**
Registration date: **2026-10-22, 1405/07/30**
Registration timing: **prospective**

Last update: **2026-10-26, 1405/08/04**
Update count: **1**

Registration date

2026-10-22, 1405/07/30

Registrant information

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Name of organization / entity

The University of Tarbiat Modares

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-11-11, 1405/08/20

Expected recruitment end date

2026-11-21, 1405/08/30

Actual recruitment start date

empty

Actual recruitment end date
empty
Trial completion date
empty

Scientific title
The Effect of Six Weeks of Sprint Exercise Snacks on Cardiometabolic Health and Cardiorespiratory Fitness in Inactive Overweight and Obese Female University Students: A Randomized Controlled Trial

Public title
Effectiveness of Sprint Exercise Snacks on Cardiometabolic Health and Fitness in Female Students
Purpose
Prevention
Inclusion/Exclusion criteria
Inclusion criteria:
Female university students aged 19 to 30 years Resident of Al-Zahra Female Dormitory at Farhangian University of Zanjan Body Mass Index (BMI) between 24.9 and 34.9 (overweight and class I obesity) Low physical activity level based on IPAQ-SF (less than 600 MET-minutes per week) No medical contraindication for vigorous physical activity No known cardiovascular, metabolic, or neuromuscular diseases that could affect the study results Ability to perform brisk walking without limitation
Exclusion criteria:
Pregnancy or lactation Active cardiovascular disease or musculoskeletal disease that prevents vigorous physical activity Use of medications affecting metabolism (such as statins or anti-diabetic drugs) Smoking and alcohol consumption Participation in a regular exercise program within 3 months prior to study initiation Acute illness at the time of screening
Age
From **19 years** old to **30 years** old
Gender
Female

Phase
N/A
Groups that have been masked

- Outcome assessor
- Data analyser

Sample size
Target sample size: **44**
Randomization (investigator's opinion)
Randomized
Randomization description
Participants are allocated to the intervention and control groups using block randomization. The unit of randomization in this study is individual. To achieve balance between groups regarding key variables such as age and baseline body mass index, stratified randomization is used based on these variables. The random sequence is generated using statistical software, whereby numbers 1 to 44 are randomly assigned to the two groups. For allocation concealment, group assignment is performed by a third party not involved in the screening or intervention process and is kept in sealed, opaque envelopes. These envelopes are opened only upon participant entry into the study and after final confirmation of eligibility criteria. Furthermore, outcome assessors are blinded to the group allocation of participants.
Blinding (investigator's opinion)
Single blinded
Blinding description
Due to the nature of the exercise intervention in this study, full blinding (double-blind or triple-blind) is not feasible. Participants are aware of their assigned group (intervention or control), and this awareness is fully and transparently disclosed in the informed consent form. The principal investigator is also aware of group allocation due to responsibility for coordinating the protocol and supervising exercise sessions. Healthcare personnel and exercise practitioners (those responsible for implementing the protocol) are also aware of participants' group status. However, blinding is applied at two levels as follows: First, outcome assessors (including those responsible for anthropometric measurements, blood sampling, physical fitness tests, and questionnaire administration) are blinded to participants' group allocation and receive data only with identification codes. Second, the data analyst is also blinded to group allocation and performs statistical analyses on coded data without knowledge of group names. No independent Data Safety and Monitoring Committee (DSMB) was established in this study. Additionally, individuals responsible for drafting the manuscript will be aware of group allocation, but interpretation of results will be based on blinded statistical analyses.
Placebo
Not used
Assignment
Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
کارگروه اخلاق در پژوهش پژوهشگاه علوم ورزشی
Street address
No. 3, 5th St., Mir Emad St., Motahari Ave.
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Province
Tehran
Postal code
۱۵۸۷۹۵۸۷۱۱
Approval date
2026-08-31, 1405/06/09
Ethics committee reference number
IR.SSRC.REC

Health conditions studied

1

Description of health condition studied
Overweight and Obesity
ICD-10 code
ICD-10 code description

Primary outcomes

1

Description
Maximal oxygen consumption (VO2max) in ml/kg/min, measured using the Rockport 1-Mile Walk Test.
Timepoint
Measured at two time points: baseline (before the intervention) and at the end of week six (after completion of the intervention).
Method of measurement
Rockport 1-Mile Walk Test; the participant walks one mile at the highest safe speed, and the time to complete the distance and heart rate immediately after the test are recorded.

2

Description
Body fat percentage, measured using a body composition analyzer.
Timepoint
Measured at two time points: baseline (before the intervention) and at the end of week six (after completion of the intervention).
Method of measurement
InBody-270 body composition analyzer; measurements are performed in a fasting state, without heavy clothing, and at least 24 hours after the last vigorous activity.

3

Description
Waist circumference in centimeters, measured using a non-elastic tape measure.
Timepoint
Measured at two time points: baseline (before the intervention) and at the end of week six (after completion of the intervention).
Method of measurement
Non-elastic tape measure; measurements are taken in a standing position at the end of a normal expiration, at the midpoint between the lowest rib and the iliac crest, with an accuracy of 0.1 cm, and the average of two consecutive measurements is recorded.

4

Description
Waist-to-height ratio, calculated by dividing waist circumference (cm) by height (cm).
Timepoint
Measured at two time points: baseline (before the intervention) and at the end of week six (after completion of the intervention).
Method of measurement
Waist-to-height ratio is calculated by dividing waist circumference (measured with a non-elastic tape measure) by height (measured with a wall-mounted stadiometer).

Secondary outcomes

1

Description
Blood lipid profile including total cholesterol, low-density lipoprotein, high-density lipoprotein, and triglycerides in milligrams per deciliter, measured by enzymatic method.
Timepoint
Measured at two time points: baseline (before the intervention) and at the end of week six (after completion of the intervention).
Method of measurement
Venous blood samples are collected after 10 to 12 hours of fasting between 7:00 and 9:00 AM; samples are centrifuged in tubes containing EDTA anticoagulant, and the separated serum is analyzed for total cholesterol, low-density lipoprotein, high-density lipoprotein, and triglycerides using laboratory kits and enzymatic method.

2

Description
Systolic and diastolic blood pressure in millimeters of mercury, measured using a digital upper-arm blood pressure monitor.
Timepoint
Measured at two time points: baseline (before the intervention) and at the end of week six (after completion of the intervention).
Method of measurement
Omron M6 Comfort digital upper-arm blood pressure monitor; measurements are taken after 10 minutes of rest in a seated position with the arm supported at heart level, and the average of two measurements taken one minute apart is recorded.

3

Description
Fasting blood glucose in milligrams per deciliter, measured by enzymatic method.
Timepoint
Measured at two time points: baseline (before the intervention) and at the end of week six (after completion of the intervention).
Method of measurement
Venous blood samples are collected after 10 to 12 hours of fasting between 7:00 and 9:00 AM; the sample is centrifuged in a tube containing EDTA anticoagulant, and the separated serum is analyzed for fasting blood glucose using a laboratory kit and enzymatic method.

4

Description
Insulin resistance index, calculated using the formula: (fasting insulin multiplied by fasting glucose) divided by 405.

Timepoint
Measured at two time points: baseline (before the intervention) and at the end of week six (after completion of the intervention).

Method of measurement
The insulin resistance index is calculated using a formula based on fasting insulin (measured by enzyme-linked immunosorbent assay) and fasting blood glucose (measured by enzymatic method).

Intervention groups

1

Description
Intervention group: Performing a 6-week sprint exercise snack protocol, three non-consecutive days per week. On each training day, three exercise snacks are performed 20 to 30 minutes before breakfast, lunch, and dinner. Each snack consists of several consecutive micro-bouts, with each micro-bout comprising 10 seconds of activity at the highest safe and technically acceptable speed followed by 20 seconds of recovery (standing or very slow walking). The number of micro-bouts per snack increases from 3 in weeks 1-2 to 4 in weeks 3-4 and 5 in weeks 5-6. Activity type: rapid, low-impact alternating step-ups with body weight on a 15-cm fixed platform. Exercise intensity is controlled using the Borg Category-Ratio 10 (CR-10) perceived exertion scale, with a target intensity of 8 to 9 out of 10 at the end of each snack. The total active high-intensity exercise time across the entire intervention is 39 minutes.

Category
Behavior

2

Description
Control group: Maintaining usual lifestyle and refraining from any new or structured exercise program during the study period. Participants in this group are advised to maintain their usual dietary and physical activity patterns as much as possible and to avoid starting any new exercise program outside the study. After completion of the study period and post-test data collection, control group members will be offered the exercise protocol (exercise snacks).

Category
N/A

Recruitment centers

1

Recruitment center

Name of recruitment center
Al-Zahra Female Dormitory, Farhangian University of Zanjan

Full name of responsible person
Farzaneh Allah Verdi

Street address
Al-Zahra Campus, Farhangian University of Zanjan, Sheikh Fazlollah Nouri Street, Opposite Dar al-Quran

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity
The Iran National Science Foundation

Full name of responsible person
Mohammad Reza Hormozi-Nezhad

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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
The Iran National Science Foundation

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
Other

Person responsible for general inquiries

Contact

Name of organization / entity

Farhangian Univeristy
Full name of responsible person
Raoof Negaresh
Position
Assistant Professor
Latest degree
Ph.D.
Other areas of specialty/work
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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
Not applicable
Analytic Code
Yes - There is a plan to make this available
Data Dictionary
Yes - There is a plan to make this available
Title and more details about the data/document
پروتکل مطالعه، داده‌های فردی ناشناس‌شده شرکت‌کنندگان (IPD)، نقشه آنالیز آماری، فرم رضایت‌نامه آگاهانه و دیکشنری داده‌ها. داده‌های فردی شامل اطلاعات جمعیت‌شناختی، شاخص‌های آنتروپومتریک، متغیرهای خونی، فشار خون و نتایج آزمون‌های آمادگی جسمانی خواهد بود که به طور کامل غیرقابل شناسایی خواهند شد
When the data will become available and for how long
It will begin 6 months after publication of the primary results and will continue for 5 years.
To whom data/document is available
Academic researchers and investigators affiliated with scientific and research institutions
Under which criteria data/document could be used
Data will be used solely for scientific and research purposes (e.g., meta-analysis or secondary data analysis). Requestors must submit a brief research proposal and sign a confidentiality agreement. Commercial use of the data is prohibited.
From where data/document is obtainable
Dr. Khalil ollah Monikh (Principal Investigator), Farhangian University of Zanjan. Email: kh.moonikh@cfu.ac.ir. Phone: +98 912 441 1878.
What processes are involved for a request to access data/document
The applicant sends a request form to the principal investigator's email. The request is reviewed by the research team (within a maximum of 2 weeks). Upon approval, a Data Transfer Agreement (DTA) is signed, and de-identified data will be provided to the applicant via a secure link.
Comments