

# Multiple daily exercise snacks can improve obesity by breaking sedentary habits

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<b>Registration date</b> 20/04/2024	<b>Overall study status</b> Completed	<input type="checkbox"/> Protocol
<b>Last Edited</b> 30/06/2025	<b>Condition category</b> Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

Obesity caused by long-term sedentary lifestyle is an important factor that endangers human health, affecting more than 10% of the world's population and has become a major health problem faced by countries around the world. The ectopic deposition of abdominal visceral fat and epicardial fat will further increase the risk of a series of metabolic complications such as hypertension, diabetes, fatty liver and cardiovascular disease. As a non-drug intervention therapy, exercise can play a positive role in reducing obesity and regulating body metabolism by increasing energy expenditure and promoting the secretion of lipolytic hormones.

Based on metabolomics, this study will explore the effect of 12 week "exercise snacks" intervention on the composition of obese adults. The aim is to provide more convenient and practical exercise prescription for obese people who are often in a sedentary state and provide the theoretical basis for the intervention of "exercise snacks" for relevant researchers.

### Who can participate?

Daily energy expenditure <4 metabolic equivalents (METs), as measured by a continuous physical activity questionnaire (IPAQ)) adults, with a BMI over 25 kg/m<sup>2</sup>

### What does the study involve?

This study is a single blind randomized controlled trial. Participants who met the inclusion criteria were randomly assigned to the Snack group for stair sprint exercise and the Control group by flipping a coin, and the supervisory personnel were unaware of any information from the other groups. Within one week prior to intervention, measure systemic and regional fat mass, epicardial adipose tissue (EAT), abdominal visceral (AVFA) and subcutaneous (ASFA) fat area, plasma metabolomics data, and maximum oxygen uptake. The snack group needs to engage in 12 weeks of stair climbing and sprinting exercise, with 4 days of exercise per week. The above indicators need to be tested again one week after the intervention is completed.

### What are the possible benefits and risks of participating?

Participants can lose weight by participating in this study and get their own exercise prescription. The risk mainly includes delayed muscle soreness after exercise. Researchers will protect the safety of the whole sports meeting.

Where is the study run from?  
Ocean University of China

When is the study starting and how long is it expected to run for?  
From January 2021 to January 2023

Who is funding the study?  
Investigator initiated and funded

Who is the main contact?  
Wenbing yu, haiyangyuwenbing@163.com

## Contact information

### Type(s)

Public, Scientific, Principal investigator

### Contact name

Prof Wenbing Yu

### Contact details

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## Additional identifiers

### Protocol serial number

OUC-HM-2021023

## Study information

### Scientific Title

Effects of breaking up prolonged sitting with exercise snacks on body composition and plasma metabolomics among sedentary obese adults

### Study objectives

Exercise snacks improve body composition and metabolomics among obese adults

### Ethics approval required

Ethics approval required

### Ethics approval(s)

approved 15/10/2021, Ocean University of China (238 Songling Road, Laoshan District, Qingdao, 266101, China; +86 15231509262; 21211913076@ouc.edu.cn), ref: OUC-HM-2021023

## **Study design**

Randomized controlled trial

## **Primary study design**

Interventional

## **Study type(s)**

Efficacy

## **Health condition(s) or problem(s) studied**

Obesity

## **Interventions**

Participants who met the inclusion criteria were randomly assigned to the Snack group for stair sprint exercise and the Control group by flipping a coin, and the supervisory personnel were unaware of any information from the other groups. From 3 weeks before the intervention to the end of the intervention, all participants are required to record their daily food intake and physical activity to monitor habitual energy intake and expenditure separately. Within one week prior to intervention, measure systemic and regional fat mass, epicardial adipose tissue (EAT), abdominal visceral (AVFA) and subcutaneous (ASFA) fat area, plasma metabolomics data, and maximum oxygen uptake. The snack group needs to engage in 12 weeks of stair climbing and sprinting exercise, with 4 days of exercise per week. The above indicators need to be tested again one week after the intervention is completed.

The intervention time was 12 weeks, and the randomization was performed by flipping a coin.

## **Intervention Type**

Behavioural

## **Primary outcome(s)**

1. Dual energy X-ray method was used to measure the body fat rate at baseline and after 12 weeks of intervention.
2. The areas of epicardial fat, abdominal visceral fat and subcutaneous fat were measured by computed tomography at baseline and after 12 weeks of intervention.

## **Key secondary outcome(s)**

Plasma metabolites were measured by liquid chromatography-mass spectrometry at baseline and after 12 weeks of intervention.

## **Completion date**

01/01/2023

## **Eligibility**

### **Key inclusion criteria**

Daily energy expenditure <4 metabolic equivalents (METs), as measured by a continuous physical activity questionnaire (IPAQ)

### **Participant type(s)**

Learner/student

**Healthy volunteers allowed**

No

**Age group**

Adult

**Lower age limit**

18 years

**Upper age limit**

26 years

**Sex**

All

**Total final enrolment**

28

**Key exclusion criteria**

Diseases such as cardiovascular disease that are not suitable for exercise

**Date of first enrolment**

16/10/2021

**Date of final enrolment**

25/10/2021

**Locations****Countries of recruitment**

China

**Study participating centre**

Ocean University of China

238 Songling Road

Laoshan District

Qingdao

China

266101

**Sponsor information****Organisation**

Ocean University of China

ROR

<https://ror.org/04rdtx186>

## Funder(s)

### Funder type

Government

### Funder Name

Natural Science Fund of Shandong Province

## Results and Publications

### Individual participant data (IPD) sharing plan

The datasets generated and analysed during the current study will be published as a supplement to the results publication.

### IPD sharing plan summary

Published as a supplement to the results publication

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>		14/11/2024	30/06/2025	Yes	No