

Testing whether brief bouts of stair climbing during daily life, guided by a smartwatch, can improve health

Submission date 11/07/2025	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
Registration date 23/09/2025	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
Last Edited 23/09/2025	Condition category Circulatory System	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

This study aims to test a time-efficient exercise method called “exercise snacking”, which involves brief bouts of stair-climbing (less than 1 minute) performed several times a day. The goal is to determine whether using a smartwatch to guide and supervise these sessions makes the program feasible and acceptable for everyday life. The study also investigated whether this form of exercise can improve aerobic and anaerobic fitness.

Who can participate?

Adults aged 18 to 59 years who are generally healthy, physically inactive (engaging in less than 1 hour of structured physical activity per week), and capable of stair climbing.

What does the study involve?

Participants complete a 6-week exercise snacking intervention, which includes: six 30-minute sessions with a personal trainer, and self-administered bouts of stair-climbing (“exercise snacks”) performed during the intervention period and recorded via a smartwatch.

The study assesses:

1. Feasibility (frequency, duration and intensity) of exercise snacks, measured using the smartwatch app.
2. Acceptability of exercise snacks in daily life with smartwatch, evaluated through interviews after 2 and 4 weeks, and a self-developed questionnaire after 6 weeks.
3. Changes in anaerobic performance and aerobic performance before and after the intervention.

What are the possible benefits and risks of participating?

Participants may improve their fitness and discover a convenient, time-efficient way to stay active without requiring gym access or trainer supervision.

As with any high-intensity exercise, there is a small risk of muscle soreness or injury, especially during stair climbing. However, the short duration of exercise snacks and supervision help minimise these risks.

Where is the study run from?
University of Konstanz (Germany)

When is the study starting and how long is it expected to run for?
July 2023 to January 2024

Who is funding the study?
University of Konstanz (Germany)

Who is the main contact?
Yvonne Ritter, yvonne.ritter@uni-konstanz.de

Contact information

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Public, Scientific

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Additional identifiers

EudraCT/CTIS number

Nil known

IRAS number**ClinicalTrials.gov number**

Nil known

Secondary identifying numbers

Nil known

Study information

Scientific Title

Effects of brief, smartwatch-guided stair-climbing "exercise snacks" on physical activity levels and cardiovascular health in inactive adults: a proof-of-concept study

Study objectives

The primary objectives of this proof-of-concept study were to evaluate the feasibility and acceptability of a newly developed stair-climbing Exercise Snacking (ES) training program. Secondary objectives included examining pre- to post-intervention changes in aerobic and anaerobic fitness following 6 weeks of ES training.

Ethics approval required

Ethics approval required

Ethics approval(s)

Approved 12/07/2023, Ethics Committee of the University of Konstanz (Universitätsstraße 10, Konstanz, 78464, Germany; +49 (0)7531885037; marcel.leist@uni-konstanz.de), ref: IRB23KN07-005w

Study design

Pre-post training study

Primary study design

Interventional

Secondary study design

Non randomised study

Study setting(s)

Home, University/medical school/dental school, Workplace

Study type(s)

Prevention

Participant information sheet

See study outputs table

Health condition(s) or problem(s) studied

Cardiovascular fitness

Interventions

Participants receive an exercise snacking intervention consisting of six 30-minute sessions with a personal trainer over the course of 6 weeks, and self-administered exercise snacks (brief stair-climbing bouts, >9 per week) performed independently during the training intervention period, guided by a smartwatch.

Intervention Type

Behavioural

Primary outcome measure

1. Feasibility of the smartwatch-guided Exercise Snacking intervention assessed based on the frequency, duration, and intensity of completed exercise snacks. Each exercise snack was recorded from the smartwatch app for analysis.
2. Acceptability of the intervention in daily life was evaluated through semi-structured interviews conducted after 2 and 4 weeks, and a self-developed questionnaire administered at the end of the 6-week training period. The questionnaire included both Likert-scaled items and open-ended questions to capture participants' subjective experiences.

Secondary outcome measures

Measured before and after the 6-week Exercise Snacking intervention:

1. Anaerobic performance assessed using the Counter Movement Jump (CMJ) and the Stair Climb Power Test (SCP)
2. Aerobic performance measured via a Cardiopulmonary Exercise Test (CPET)

Overall study start date

12/07/2023

Completion date

31/01/2024

Eligibility

Key inclusion criteria

1. Healthy (Physical Activity Readiness Questionnaire, PAR-Q+)
2. Physically inactive (self-reported <1 hour of structured physical activity per week)

Participant type(s)

Employee, Learner/student

Age group

Adult

Lower age limit

18 Years

Upper age limit

59 Years

Sex

Both

Target number of participants

10

Total final enrolment

10

Key exclusion criteria

1. Cardiometabolic or orthopedic diseases
2. Other conditions contraindicating intensive endurance training

Date of first enrolment

01/09/2023

Date of final enrolment

01/12/2023

Locations

Countries of recruitment

Germany

Study participating centre

University of Konstanz

Universitätsstraße 10

Konstanz

Germany

78464

Sponsor information

Organisation

University of Konstanz

Sponsor details

Universitätsstraße 10

Konstanz

Germany

78464

Sponsor type

University/education

Website

<https://www.sportwissenschaft.uni-konstanz.de>

ROR

<https://ror.org/0546hnb39>

Funder(s)

Funder type

University/education

Funder Name

Universität Konstanz

Alternative Name(s)

University of Konstanz, unikonstanz

Funding Body Type

Government organisation

Funding Body Subtype

Universities (academic only)

Location

Germany

Results and Publications

Publication and dissemination plan

Planned publication in a peer-reviewed journal

Intention to publish date

01/10/2025

Individual participant data (IPD) sharing plan

The datasets generated during and/ or analyzed during the current study will be available upon request from Yvonne Ritter (Yvonne.ritter@uni-konstanz.de)

IPD sharing plan summary

Available on request

Study outputs**Output type**

[Participant information sheet](#)

Details**Date created**

27/09/2023

Date added

14/07/2025

Peer reviewed?

No

Patient-facing?

Yes