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Effects of a 24-week block-based versus circuit-based exercise program in overweight and obese Chilean adults

Submission date
05/07/2026

Recruitment status
No longer recruiting

Registration date
06/07/2026

Overall study status
Ongoing

Last Edited
06/07/2026

Condition category
Nutritional, Metabolic, Endocrine

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Overweight and obesity are very common health problems that increase the risk of developing conditions such as diabetes, high blood pressure, and heart disease. Physical exercise is one of the main strategies for improving the health of people with excess body weight. However, it is still unclear which way of organizing resistance training provides the greatest health benefits. This study aims to compare two types of resistance training (block training and circuit training) to evaluate their effects on heart function, body composition, physical activity levels, and quality of life in adults with overweight and obesity.

Who can participate?
Adult men with overweight or obesity who meet the study eligibility criteria and agree to participate voluntarily by providing written informed consent.

What does the study involve?
Participants will be randomly assigned to one of two resistance training programs: block training or circuit training. Both programs will last for 24 weeks and include three supervised exercise sessions per week. Before and after the training program, participants will undergo assessments of body composition, muscle strength, functional capacity, heart rate variability, physical activity level, and quality of life using physical measurements and validated questionnaires.

What are the possible benefits and risks of participating?
Participants may improve their physical fitness, body composition, cardiovascular health, physical activity level, and quality of life. The risks are similar to those of any exercise program and include muscle soreness, fatigue, or minor exercise-related injuries. All training sessions will be supervised by qualified professionals to minimize these risks.

Where is the study run from?
Arturo Prat University (Chile)

When is the study starting and how long is it expected to run for?
The study is expected to begin on 13 July 2026. Each participant will take part in the study for approximately 24 weeks, and the entire project is expected to last approximately 7 months.

Who is funding the study?
This study has no external funding.

Who is the main contact?
Héctor Fuentes Barría, hefuentes_@unap.cl

Contact information

Type(s)
Principal investigator, Scientific, Public

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Study information

Scientific Title
Effects of a 24-week block-based versus circuit-based exercise program in overweight and obese Chilean adults

Study objectives
To evaluate the effects of a block based physical exercise program versus a circuit exercise program both individualized based on heart rate variability on cardiovascular autonomic regulation, body composition, and quality of life in overweight and obese Chilean adults.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 03/07/2026, Ethics Committee of the Iberoamerican International University (Calle 15 No. 36, between 10 and 12, Campeche, 24560, Mexico; +56 (0)(981) 811 0246; contacto@unini.edu.mx), ref: CR-252

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Blinded (masking used)

Control
Active

Assignment
Parallel

Purpose
Prevention, Treatment

Study type(s)

Health condition(s) or problem(s) studied
Cardiovascular autonomic regulation, body composition, and quality of life in Chilean adults with overweight and obesity

Interventions
The study involved a 24-week resistance training program with three weekly sessions (Monday, Wednesday, and Friday), each lasting 48 to 57 minutes. Participants were randomly assigned to either an experimental group (EG) or a control group (CG) using a stratified 1:1 allocation method to ensure unbiased group distribution.

The EG performed resistance exercises in blocks (push-ups, mountain climbers, squats, jumping jacks, burpees, and skipping), while the CG performed the same exercises in a circuit format. Training intensity was monitored using Polar® devices, and total training volume was equivalent in both groups, with differences only in exercise distribution. The program was structured into a warm-up (5 min), main phase (38–47 min), and cool-down (5 min). Heart rate was targeted at 60–90% of maximum heart rate throughout the 24 weeks, with adjustments based on Karvonen's formula. Both groups followed a fixed rest schedule between repetitions and sets.

Assessments were conducted before and after the intervention to evaluate physical activity level, body composition, muscle strength, functional capacity, sprint performance, recovery, and quality of life.

Intervention Type
Behavioural

Primary outcome(s)
1. Body composition measured using Metabolic Equivalent of Task, Body Mass Index and waist circumference at 24 weeks

Key secondary outcome(s)
1. Muscle strength measured using right and left hand grip dynamometer at 24 weeks

2. Speed measured using running anaerobic sprint test at 24 weeks

3. Functional capacity measured using 6-minute walking test at 24 weeks

4. Recovery capacity measured using heart rate variability in the Low Frequency/High Frequency (LF/HF) ratio and Root Mean Square of Successive Differences (RMSSD) at 24 weeks

5. Physical activity level measured using the International Physical Activity Questionnaire – Short Form (IPAQ-SF) at 24 weeks

6. Quality of life measured using the World Health Organization Quality of Life Instrument – Brief version (WHOQOL-BREF) at 24 weeks

Completion date
27/12/2026

Eligibility

Key inclusion criteria
1. Chilean adults aged 18 to 44 classified as overweight or obese based on body mass index
2. Participants must refrain from moderate- or vigorous-intensity physical activity for the 48 hours prior to each assessment or training session to avoid interfering with the acute physiological response
3. Punctual and regular attendance at all scheduled training sessions throughout the 24-week intervention
4. Sign an informed consent form
5. Proper understanding of the study's procedures, objectives, and potential risks

Healthy volunteers allowed
Yes

Age group
Adult

Lower age limit
18 Years

Upper age limit
44 Years

Sex
Male

Total final enrolment
52

Key exclusion criteria

1. Significant metabolic diseases or musculoskeletal conditions that limit physical exercise
2. Perform below 644 m on the 6-minute walk test
3. Simultaneously participating in another physical training program during the intervention period.

Date of first enrolment
10/07/2026

Date of final enrolment
12/07/2026

Locations

Countries of recruitment
Chile

Sponsor information

Organisation
Universidad Internacional Iberoamericana

ROR
https://ror.org/04587ry40

Funder(s)

Funder type

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available