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Influence of the Pilates method on the health of older adults

Submission date
12/09/2026

Recruitment status
No longer recruiting

Registration date
26/09/2026

Overall study status
Ongoing

Last Edited
21/09/2026

Condition category
Other

[ ] 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
Pilates is a form of exercise that may help older adults maintain or improve their physical and overall health. However, more research is needed to understand its effects on functional capacity, physical fitness, quality of life, and metabolic and cellular health in older adults.

This study aims to investigate whether a 12-week Pilates exercise programme can improve functional capacity, physical health, quality of life and well-being, and clinical, metabolic and cellular health in older adults. The study will also examine whether different levels of physical activity are associated with different responses to Pilates.

Who can participate?
The study will include adults aged 60 years and older who meet the study eligibility criteria. Participants must be able to understand the study procedures, provide informed consent, and safely perform the physical assessments and exercise programme.

What does the study involve?
Approximately 60 participants will take part in the study. Participants will be divided into three groups: a sedentary control group, a sedentary group that will participate in Pilates, and a physically active group that will participate in Pilates.

Participants in the Pilates groups will take part in supervised Pilates sessions twice a week for 12 weeks. Each session will last approximately 45–50 minutes and will include exercises adapted to older adults.

All participants will undergo assessments before and after the study period. These assessments will include measures of physical function and fitness, balance, muscle strength, flexibility, body composition, cardiovascular and metabolic health, quality of life and well-being. Biological samples will also be collected to assess metabolic, inflammatory and cellular markers.

The sedentary control group will not participate in the Pilates programme but will complete the study assessments.

What are the possible benefits and risks of participating?
Participants may benefit from taking part in a structured exercise programme and from increased awareness of aspects of their physical and health status. However, individual health improvements cannot be guaranteed.

The Pilates programme and physical assessments may cause temporary muscle soreness, tiredness or discomfort. There may also be a small risk of loss of balance or injury during physical assessments or exercise. Appropriate safety procedures will be followed, and participants will be monitored throughout the assessments and exercise sessions.

Blood sample collection may cause temporary discomfort, bruising or, rarely, dizziness or fainting.

Where is the study run from?
The study is being conducted by the Faculty of Sport Sciences and Physical Education, University of Coimbra, Portugal.

When is the study starting and how long is it expected to run for?
The intervention is expected to start in September 2026 and will last 12 weeks. Participant assessments and data collection will take place before and after the intervention period. The overall study is expected to continue beyond the intervention period to allow for completion of data analysis and reporting.

Who is funding the study?
The study is being conducted as part of a doctoral research project at the University of Coimbra. The study is supported by the Faculty of Sport Sciences and Physical Education, University of Coimbra. No commercial funding is involved.

Who is the main contact?
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Additional identifiers

Study information

Scientific Title
Effects of a 12-week Pilates intervention on physical fitness, body composition, blood biomarkers, and functional health in older adults compared with sedentary and physically active older adults not participating in Pilates

Study objectives
This study aims to collect, analyse, and generate scientific evidence to address the following research questions:
1. Does Pilates practice positively influence functional capacity and quality of life in older adults?
2. Which conditions of Pilates practice tend to produce the most significant outcomes?
3. What is the impact of Pilates practice on cardiovascular risk factors and physical fitness variables, including strength, endurance, and flexibility, in older adults?
4. What is the impact of the Pilates method on metabolic and cellular health in older adults?

Ethics approval required
Ethics approval required

Ethics approval(s)
Submitted 24/05/2026, University of Coimbra Ethics Committee (University of Coimbra Paço das Escolas Portugal Universidade de Coimbra, Coimbra, 3004-531 Coimbra, Portugal; +351 239 859 900; comissaoetica_research@uc.pt), ref: CE/FCDEF-UC/00132026

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Blinded (masking used)

Control
Active

Assignment
Parallel

Purpose
Prevention

Study type(s)

Health condition(s) or problem(s) studied
Effects of Pilates exercise on health and healthy ageing in older adults

Interventions
Participants will undergo baseline assessments before being allocated to one of three study groups: (1) a sedentary control group, which will not receive the Pilates intervention and will undergo the study assessments only; (2) a sedentary Pilates group, which will participate in a supervised Pilates exercise programme; and (3) an active Pilates group, consisting of physically active older adults who will also participate in the Pilates exercise programme.

Participants in the Pilates groups will undertake supervised Pilates sessions twice per week, with each session lasting approximately 45 minutes, for 12 weeks. The Pilates programme will be delivered by qualified instructors with 10 or more years of experiance and will consist of structured mat-based Pilates exercises appropriate for older adults.

Participants in all groups will undergo the same baseline and post-intervention assessments. These assessments will include measures of functional capacity, physical fitness, anthropometry and body composition, cardiovascular risk factors, metabolic health, cellular and inflammatory markers, and quality of life. Assessments will include physical performance tests, questionnaires, body composition analysis, cardiovascular measurements, and biological sample collection, as specified in the study protocol.

The study employs a partially randomised allocation procedure. Allocation is initially determined according to predefined participant characteristics, particularly baseline physical activity status, as these characteristics are integral to the study design and determine eligibility for specific study groups. Consequently, not all participants are eligible for allocation to all study groups. Among participants who are eligible for allocation between the relevant intervention and control groups, group allocation is subsequently performed using an online randomisation tool. This approach allows the study to maintain the predefined group structure while ensuring an objective and reproducible allocation procedure wherever random allocation is applicable.

Intervention Type
Behavioural

Primary outcome(s)
1. Functional capacity measured using the Timed Up and Go (TUG) test (time to complete the test, in seconds) and the 6-Minute Walk Test (6MWT) (distance walked in 6 minutes, in metres) at baseline and immediately after the 12-week intervention

2. Overall physical health measured using anthropometric measurements, body composition, cardiovascular measurements, physical fitness assessments, and functional performance tests at baseline (pre-intervention) and immediately post-intervention (12 weeks)

3. Quality of life and well-being measured using the quality-of-life questionnaire included in the study assessment toolkit at baseline (pre-intervention) and immediately post-intervention (12 weeks)

4. Clinical and metabolic indicators measured using fasting blood glucose, insulin, HbA1c, haemoglobin, leptin, adiponectin, and pro- and anti-inflammatory cytokines, together with cellular senescence markers assessed by flow cytometry at baseline (pre-intervention) and immediately post-intervention (12 weeks)

Key secondary outcome(s)

Completion date
15/12/2026

Eligibility

Key inclusion criteria
1. Adults aged 60 years or older
2. Able to understand the study procedures and provide written informed consent
3. Able to walk independently, with or without usual walking aids
4. Able to participate safely in the Pilates exercise programme and physical assessments, as determined by the study team
5. Willing and able to attend the scheduled study assessments and intervention sessions, where applicable
6. For participants allocated to the Pilates groups, no participation in a regular Pilates programme during the previous 6 months

Healthy volunteers allowed
Yes

Age group
Mixed

Lower age limit
60 Years

Upper age limit
90 Years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. Presence of a medical condition or physical limitation that contraindicates participation in moderate-intensity physical exercise or Pilates, as determined by the study team
2. Inability to walk independently or to safely perform the physical assessments required by the study
3. Cognitive or communication impairment that prevents understanding the study procedures or providing informed consent
4. Current participation in a regular Pilates exercise programme, for participants allocated to groups for which previous Pilates participation is an exclusion criterion
5. Planned absence or inability to attend the required study assessments or intervention sessions
6. Any other condition identified by the research team that would prevent safe participation or compromise the validity of the study assessments

Date of first enrolment

10/09/2026

Date of final enrolment
16/09/2026

Locations

Countries of recruitment
Portugal

Sponsor information

Organisation
University of Coimbra

ROR
https://ror.org/04z8k9a98

Funder(s)

Funder type

Funder Name
Universidade de Coimbra

Alternative Name(s)
University of Coimbra, Universidade de Coimbra in Portugal, University of Coimbra | Coimbra, Portugal | UC, University of Coimbra (UC), ucoimbra, UC

Funding Body Type
Government organisation

Funding Body Subtype
Universities (academic only)

Location
Portugal

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Not expected to be made available