

Clinical Trial Protocol

Iranian Registry of Clinical Trials

10 Jun 2026

Effect of Aerobic Exercise on Implicit Learning, Retention, and Transfer of Upper Extremity Motor Skills in Parkinson's Patients with Freezing of Gait

Protocol summary

Study aim

Investigating and Comparing the Effect of Moderate-Intensity Aerobic Exercises on Implicit Learning, Recall, and Skill Transfer of Upper Limbs in Parkinson's Patients with Freezing of Gait

Design

Twenty-eight Parkinson's patients with freezing of gait symptoms were randomly assigned in a no-blind manner to either intervention or control groups.

Settings and conduct

hospitals and clinics across Tehran will be investigated.

Participants/Inclusion and exclusion criteria

✓ Age between 30 and 75 years ✓ Diagnosis of idiopathic Parkinson's disease ✓ Disease stage 1-4 according to the Hoehn & Yahr scale ✓ Adequate cognitive status with a score above 24 on the MoCA test ✓ No history of addiction or diabetes ✓ No other neurological disorders ✓ No untreated orthopedic conditions ✓ Presence of Freezing of Gait (FOG)
Exclusion Criteria: ✓ Individuals whose medication regimen changes during the study ✓ Development of disabling comorbid conditions during the study ✓ Presence of cardiovascular or respiratory problems

Intervention groups

Intervention Group: In the acquisition phase, before performing the simulated eating task, participants perform 30 minutes of moderate-intensity aerobic exercise (60-70% of maximum heart rate) on an ergometer. After 10 minutes of rest, the simulated eating task is performed. Control Group: This group rests in a seated position for a duration equal to the aerobic exercise time of the intervention group and enters the simulated eating task practice phase without performing aerobic exercise.

Main outcome variables

Upper limb skill learning Retention Transfer

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20160822029471N2**

Registration date: **2025-09-07, 1404/06/16**

Registration timing: **prospective**

Last update: **2025-09-07, 1404/06/16**

Update count: **0**

Registration date

2025-09-07, 1404/06/16

Registrant information

Name

mohammadtaghi joghataei

Name of organization / entity

professor

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Iran (Islamic Republic of)

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-09-11, 1404/06/20

Expected recruitment end date

2025-10-22, 1404/07/30

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Effect of Aerobic Exercise on Implicit Learning, Retention, and Transfer of Upper Extremity Motor Skills in Parkinson's Patients with Freezing of Gait

Public title

Effect of Aerobic Exercise on Implicit Learning in Parkinson's Patients with Freezing of Gait

Purpose

Education/Guidance

Inclusion/Exclusion criteria

Inclusion criteria:

Parkinson's disease patients in Hohnhe and Yahr stage 1-4 intact cognitive function (i.e., score ≥ 24 on the Montreal Cognitive Assessment (MoCA))

Exclusion criteria:

cardiovascular and pulmonary problems

Age

From **30 years** old to **80 years** old

Gender

Both

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **28**

Randomization (investigator's opinion)

Randomized

Randomization description

After the initial assessments, patients with Parkinson's disease who have freezing of gait will be randomly allocated using a block randomization method (with concealed allocation via sealed opaque envelopes) in a 1:1 ratio into two groups: The group receiving aerobic exercise prior to motor training, and The group that does not receive aerobic exercise before motor training.

Blinding (investigator's opinion)

Not blinded

Blinding description

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics committee of Iran University of Medical Sciences

Street address

Hemmat highway

City

Tehran

Province

Tehran

Postal code

1449614535

Approval date

2023-03-11, 1401/12/20

Ethics committee reference number

IR.IUMS.REC.1401.1004

Health conditions studied

1

Description of health condition studied

Parkinson's disease

ICD-10 code

G20

ICD-10 code description

Parkinson's disease

Primary outcomes

1

Description

Implicit learning, retention and transfer

Timepoint

قبل از مداخله - بعد از مداخله

Method of measurement

time

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: Patients in this group, prior to the motor learning sessions (three consecutive sessions), perform a total of three sessions of moderate-intensity aerobic exercise. The exercises are carried out on a stationary bicycle for 30 minutes. Exercise intensity is adjusted so that participants pedal at a rate of 50 to 70 revolutions per minute, corresponding to 70% of their maximum heart rate.

Category

Rehabilitation

2

Description

Control group: Patients in this group do not perform any aerobic exercise and remain at rest during this period.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Rasol akram Hospital

Full name of responsible person

Amir hosseyn Habibi

Street address

Rasoul-e Akram Hospital, Maziar Mansouri Street,
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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

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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

Iran University of Medical Sciences

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**

Academic

Person responsible for general inquiries

Contact**Name of organization / entity**

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Full name of responsible person

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Position

Professor in Anatomy

Latest degree

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Sharing plan**Deidentified Individual Participant Data Set (IPD)**

Undecided - It is not yet known if there will be a plan to make this available

Study Protocol

Yes - There is a plan to make this available

Statistical Analysis Plan

Not applicable

Informed Consent Form

Yes - There is a plan to make this available

Clinical Study Report

Yes - There is a plan to make this available

Analytic Code

Not applicable

Data Dictionary

Not applicable

Title and more details about the data/document

Part of the data, such as information related to the primary outcome or similar, can be shared.

When the data will become available and for how long

Access period begins 6 months after publication of the results.

To whom data/document is available

Data will be available to researchers affiliated with academic and scientific institutions.

Under which criteria data/document could be used

Data inspection is permitted provided proper citation is given.

From where data/document is obtainable

Dr. Mohammad Tagh Joghataei joghataei@iums.ac.ir

What processes are involved for a request to access data/document

Data are available for inspection by qualified researchers upon request, subject to appropriate citation and ethical considerations.

Comments