

Clinical Trial Protocol

Iranian Registry of Clinical Trials

10 Jun 2026

Effects of backward walking on balance, gait, functional and muscle activity in women with multiple sclerosis

Protocol summary

Study aim

Investigating the effects of backward walking on balance, gait, function, and muscle activity in women with multiple sclerosis

Design

The current research is semi-experimental and practical and has pre-test and post-test. It has an intervention group and a control group, with parallel and unblinded groups. The statistical population will include women with MS in Arak city. Using G*power software, 30 people were selected in a purposeful and accessible manner, and then they will be randomly divided into two experimental groups (15 people) and control (15 people).

Settings and conduct

After completing the consent form, the pre-test including timed up and go test, dynamic gait index test, 25-foot walk test, Berg test, electromyography test is performed in the laboratory of Arak University. After 8 weeks of training, the post-test will be repeated with the same assessments. Trainings are held in the gymnasium of Arak University.

Participants/Inclusion and exclusion criteria

Participants: Women with multiple sclerosis in Arak
Inclusion: Age 25-45, EDSS score 3-6, no cardiovascular, neurological, or orthopedic conditions
Exclusion: Withdrawal from study, injury during research

Intervention groups

Experimental Group: Backward walking training for 8 weeks, 3 sessions per week, including moderate-intensity backward walking with rest intervals. Control Group: Forward walking training with the same frequency, intensity, and duration, without backward walking exercises

Main outcome variables

Balance; Gait speed; Motor performance; Muscle activity

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20250206064672N1**
Registration date: **2025-03-24, 1404/01/04**
Registration timing: **prospective**

Last update: **2025-03-24, 1404/01/04**

Update count: **0**

Registration date

2025-03-24, 1404/01/04

Registrant information

Name

Faezeh Moradi

Name of organization / entity

Arak University

Country

Iran (Islamic Republic of)

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+98 38 3426 3814

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-04-14, 1404/01/25

Expected recruitment end date

2025-07-11, 1404/04/20

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Effects of backward walking on balance, gait, functional and muscle activity in women with multiple sclerosis

Public title

Effects of backward walking on balance, gait, functional and muscle activity in women with multiple sclerosis

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

Women with multiple sclerosis between the ages of 25-45 Expanded Disability Status Scale (EDSS) score between -3 and 6 Absence of any cardiovascular, neurological, orthopedic diseases, ear problems, etc.

Exclusion criteria:

If for any reason they are not willing to continue participating in the research and suffer an injury during the research that prevents them from continuing.

Age

From **25 years** old to **50 years** old

Gender

Female

Phase

1-2

Groups that have been masked

No information

Sample size

Target sample size: **30**

Randomization (investigator's opinion)

Not randomized

Randomization description

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

Arak University Ethics Committee

Street address

Arak University, Karbala Blvd, Basij Sq, Arak, Iran

City

Arak

Province

Markazi

Postal code

۳۸۴۱۷۷۵۸۴

Approval date

2025-01-08, 1403/10/19

Ethics committee reference number

IR.ARAKU.REC.1403.060

Health conditions studied

1

Description of health condition studied

Multiple sclerosis

ICD-10 code

G35

ICD-10 code description

G35

Primary outcomes

1

Description

Balance: The patient's balance score is assessed using the Berg Balance Scale. This scale consists of 14 items that evaluate the patient's ability to maintain balance in different positions.

Timepoint

At the beginning of the study and after 8 weeks of training

Method of measurement

Berg Balance Scale

2

Description

Gait

Timepoint

At the beginning of the study and after 8 weeks of training

Method of measurement

25-foot walk test

3

Description

Functional Activity

Timepoint

At the beginning of the study and after 8 weeks of training

Method of measurement

Dynamic Gait Index (DGI)

4

Description

Electromyography - EMG

Timepoint

At the beginning of the study and after 8 weeks of training

Method of measurement

Recording electrical signals from calf and thigh muscles during walking using EMG

Secondary outcomes

empty

Intervention groups

1

Description

"Intervention group:" Participants in this group will perform forward and backward walking exercises for 8 weeks, 3 sessions per week. Each session will consist of normal walking, followed by 10 minutes of rest, and then moderate-intensity backward walking exercises (14-15 on the Borg scale). The number of repetitions will vary from 3 to 10 times, with 1 to 2 minutes of rest between repetitions. The exercises will be performed under the supervision of researchers in the gymnasium of Arak University.

Category

Rehabilitation

2

Description

Control group: The participants of this group perform forward walking exercise for 8 weeks, 3 sessions per week. Each session consists of normal walking of moderate intensity (14-15 according to the Borg scale). The number of repetitions varies from 3 to 10 times and 1 to 2 minutes rest is considered between repetitions. Exercises are carried out under the supervision of researchers in the sports hall of Arak University.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Multiple Sclerosis Society

Full name of responsible person

Abbas Amiri

Street address

MS Patients Complex, Next to Yadegar-e-Imam Stadium, Farabi Street, Gerdo Town, Arak, Markazi Province, Iran

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Arak University

Full name of responsible person

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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

Arak University

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

Arak University

Full name of responsible person

Faezeh Moradi

Position

Student

Latest degree

Bachelor

Other areas of specialty/work

Pathology and corrective movements

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Position

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Latest degree

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Other areas of specialty/work

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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

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

Statistical Analysis Plan

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

Informed Consent Form

No - There is not a plan to make this available

Clinical Study Report

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

Analytic Code

No - There is not a plan to make this available

Data Dictionary

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