# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

09 Nov 2026

## The Effect of Eight-week Dynamic Neuromuscular Stability Training With and Without Mirror Use on Motor Function, Proprioception, and Body Awareness in Patients with Parkinson’s Disease

## Protocol summary

**Study aim**

The aim of this study is to evaluate the effect of eight weeks of dynamic neuromuscular stability training with and without mirrors on motor function, proprioception, and body awareness in patients with Parkinson's disease.

**Design**

Two-arm parallel group randomised trial with case-by-case matching based on the severity of the disease

**Settings and conduct**

This study will be conducted at the University of Isfahan under the supervision of a physician and by researcher team. The person analyzing the data will not be aware of the researcher's exact purpose.

**Participants/Inclusion and exclusion criteria**

Inclusion criteria: 1- Age range 50 to 70 years 2- Patients with Parkinson's disease (Hun and Yar score 3 or less) 3- Voluntary consent to participate in the study 4- No other neurological or musculoskeletal diseases Exclusion criteria: 1- History of surgery or fracture in the lower limbs 2- Participation in physical rehabilitation programs simultaneously with the research 3- Failure to regularly participate in training sessions (five alternating sessions or three consecutive sessions) 4- Failure to complete the research tests 5- Unforeseen circumstances that prevent the patient from participating in the study. 6- Voluntary withdrawal from participation in the study 7- Visible visual impairment

**Intervention groups**

Both groups in this study will use the 8-week exercise. The intervention group (mirror) will use the mirror, while the control group exercises without a mirror.

**Main outcome variables**

Measuring motor function, proprioception, and body awareness in patients with Parkinson's disease

## General information

**Reason for update**

**Acronym**

**IRCT registration information**

IRCT registration number: **IRCT20251101067842N1**
Registration date: **2025-12-24, 1404/10/03**
Registration timing: **prospective**

Last update: **2025-12-24, 1404/10/03**
Update count: **0**

**Registration date**

2025-12-24, 1404/10/03

**Registrant information**

**Name**

Mohaddeseh Assari

**Name of organization / entity**

**Country**

Iran (Islamic Republic of)

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**Recruitment status**

**Recruitment complete**

**Funding source**

**Expected recruitment start date**

2026-01-10, 1404/10/20

**Expected recruitment end date**

2026-01-20, 1404/10/30

**Actual recruitment start date**

empty

**Actual recruitment end date**

empty

**Trial completion date**

empty

**Scientific title**
The Effect of Eight-week Dynamic Neuromuscular Stability Training With and Without Mirror Use on Motor Function, Proprioception, and Body Awareness in Patients with Parkinson’s Disease

**Public title**
The effect of exercise on patients with parkinson's disease

**Purpose**
Supportive

**Inclusion/Exclusion criteria**

**Inclusion criteria:**
Age range 50 to 70 years2- Patients with Parkinson's disease (Hun and Yar scale score of 3 and below)3- Voluntary consent to participate in the research4- No other neurological or musculoskeletal diseases

**Exclusion criteria:**
1-History of surgery or fracture in the lower limbs 2- Participation in physical rehabilitation programs simultaneously with the research 3- Failure to regularly participate in training sessions (five alternating sessions or three consecutive sessions) 4- Failure to complete research tests 5- Unforeseen circumstances that prevent the patient from participating in the research 6- Voluntary withdrawal from participation in the research 7- Visible visual impairment

**Age**
From **50 years** old to **70 years** old

**Gender**
Both

**Phase**
N/A

**Groups that have been masked**
*No information*

**Sample size**
Target sample size: **30**

**Randomization (investigator's opinion)**
Randomized

**Randomization description**
In this study, prior to the initiation of the intervention, it is planned that 30 eligible patients will be recruited using a convenience sampling method (scores 1 to 3 based on the Hoehn and Yahr scale). To control for disease severity, it is planned that after enrollment and before group allocation, patients would be paired based on their Hoehn and Yahr scores. For each pair, random allocation to the mirror or control group was planned using a predefined simple randomization procedure. Specifically, for each pair, a random number would be generated using a random number table. If the generated number was even, the first patient in the pair would be assigned to the experimental group and the second to the control group; if the number was odd, the allocation would be reversed. This predefined process will be applied to all pairs, resulting in two groups of 15 participants with comparable distributions of disease severity.

**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**
Ethical Committee of Isfahan University

**Street address**
Building No. 4, Vice President for Research and Technology, Isfahan University of Medical Sciences and Health Services, Hezar Jerib Street

**City**
Isfahan

**Province**
Isfehan

**Postal code**
8174673461

**Approval date**
2025-08-26, 1404/06/04

**Ethics committee reference number**
IR.UI.REC.1404.117

## Health conditions studied

### 1

**Description of health condition studied**
parkinson disease

**ICD-10 code**
parkinson

**ICD-10 code description**
G20

## Primary outcomes

### 1

**Description**
The effect of exercise protocol on static balance in patients with Parkinson's disease.

**Timepoint**
Static balance was measured first before the start of training and then after two months of training.

**Method of measurement**
Sharpend Romberg test

### 2

**Description**
Determining the effect of exercise protocol on dynamic balance in patients with Parkinson's disease.

**Timepoint**
Dynamic balance was measured first before the start of training and then after two months of training.

**Method of measurement**
Timed up and Go test

**3**

**Description**
Determining the effect of an exercise protocol on hand tremor in patients with Parkinson's disease.
**Timepoint**
Hand tremor was measured first before the start of the exercises and then after two months of training.
**Method of measurement**
MDS-UPDRS questionnaire

**4**

**Description**
Determining the effect of exercise protocol on muscle strength in patients with Parkinson's disease.
**Timepoint**
Muscle strength was measured first before the start of training and then after two months of training.
**Method of measurement**
Digital hand-held dynamometer

**5**

**Description**
Determining the effect of the exercise protocol on the range of motion of patients with Parkinson's disease.
**Timepoint**
The patients' range of motion was measured first before starting the exercises and then after two months of training.
**Method of measurement**
Goniometer

**6**

**Description**
Determining the effect of an exercise protocol on the quality of life of patients with Parkinson's disease.
**Timepoint**
Quality of life was measured first before the start of the exercises and then after two months of training.
**Method of measurement**
Specific questionnaire on quality of life for patients with Parkinson's disease

**7**

**Description**
Determining the effect of an exercise protocol on body awareness in patients with Parkinson's disease.
**Timepoint**
Body awareness was measured first before the start of the exercises and then after two months of training.
**Method of measurement**
Motor imagery questionnaire

**8**

**Description**
Determining the effect of an exercise protocol on proprioception in patients with Parkinson's disease
**Timepoint**
Proprioception was measured first before the start of the training and then after two months of training.
**Method of measurement**
Goniometer

## Secondary outcomes

**1**

**Description**
Forced Expiratory Volume in 1 Second (FEV1)
**Timepoint**
At baseline and after the 8-week intervention
**Method of measurement**
Spirometry

**2**

**Description**
Forced vital capacity (FVC)
**Timepoint**
At baseline and after the 8-week intervention
**Method of measurement**
Spirometry

**3**

**Description**
FEV1FVC1
**Timepoint**
At baseline and after the 8-week intervention
**Method of measurement**
Spirometry

## Intervention groups

**1**

**Description**
Intervention group: Intervention group: After the subjects are selected based on the inclusion and exclusion criteria, the subjects are selected purposefully. Then, they are given explanations about the purpose of the research and how the research will be conducted, and written consent is obtained from the subjects to voluntarily participate in the research. Then, a pre-test is taken on the dependent variables, and the subjects are randomly and pairedly divided into two groups based on the Hon and Yar scale, one group with a mirror and one group without a mirror. Next, the training intervention (dynamic neuromuscular stability exercises) with mirror therapy is applied to the subjects in the experimental groups for eight weeks, 3 sessions per week.
**Category**
Rehabilitation

## Recruitment centers

**1**

**Recruitment center**
**Name of recruitment center**
Isfahan Parkinson Patients Charity
**Full name of responsible person**
Gholam Ali Ghasemi
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Alley 58 (Payam), Keshavarz Boulevard, Shahid Mofateh Intersection towards Simin Intersection
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## Sponsors / Funding sources

**1**

**Sponsor**
**Name of organization / entity**
Esfahan University of Medical Sciences
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**Grant name**
Vice President for Research, University of Isfahan
**Grant code / Reference number**
**Is the source of funding the same sponsor organization/entity?**
No
**Title of funding source**
Esfahan 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**
Esfahan University of Medical Sciences
**Full name of responsible person**
Esfahan University of Medical Sciences
**Position**
university professor
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## Person responsible for scientific inquiries

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## Person responsible for updating data

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Esfahan University of Medical Sciences
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## Sharing plan

**Deidentified Individual Participant Data Set (IPD)**
Yes - There is 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**
Undecided - It is not yet known if there will be 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**
Undecided - It is not yet known if there will be a plan to make this available
**Data Dictionary**
Undecided - It is not yet known if there will be a plan to make this available
**Title and more details about the data/document**
Aggregate data can be shared after individuals are de-identified.
**When the data will become available and for how long**
Access period starts 6 months after results are published.
**To whom data/document is available**
Available only to those working in scientific, industrial, and academic institutions.
**Under which criteria data/document could be used**
reaserchers
**From where data/document is obtainable**
Email the responsible author.
**What processes are involved for a request to access data/document**
we will respond them when they send email to us.
**Comments**