

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

02 Jul 2026

### The effect of upper extremity mental imagery exercise on rehabilitation of upper extremity motor imagery and movement in multiple sclerosis patients

#### Protocol summary

##### Study aim

1- To evaluate the effect of motor imagery practice on motor imagery ability 2-To evaluate the effect of motor imagery practice on upper-extremity rehabilitation in MS patients.

##### Design

clinical trial with a parallel control group of 37 multiple sclerosis patients; quasi randomized according to doctor choice; non-blinded

##### Settings and conduct

settings: A university affiliated neuroscience center

##### Participants/Inclusion and exclusion criteria

1. They were right-handed according to Edinburg Handedness Inventory; 2. Their disease had remained stable in the last three months before the examination; 3. They were not affected with other brain diseases such as stroke, traumatic brain injury, seizure, and mental retardation; 4. Patients' scores in the cognitive assessment based on Mini Mental State Examination were above 24; 5. Patients' disability according to the Kurtzke Expanded Disability Status Scale (EDSS) was less than 3.5.

##### Intervention groups

1-Intervention group: The motor imagery training consisted of 10 sessions for 2 consecutive weeks (5 days a week). During MI training, each action is imagined in the first person and the patient should not make actual movements. 2-Control group: no physical and mental training took place within these ten days in the control group.

##### Main outcome variables

1-Manual dexterity 2-Motor imagery ability

#### General information

##### Reason for update

##### Acronym

#### IRCT registration information

IRCT registration number: **IRCT20180902040927N4**

Registration date: **2018-10-20, 1397/07/28**

Registration timing: **retrospective**

Last update: **2018-10-20, 1397/07/28**

Update count: **0**

#### Registration date

2018-10-20, 1397/07/28

#### Registrant information

##### Name

Mahdieh Azin

##### Name of organization / entity

##### Country

Iran (Islamic Republic of)

##### Phone

+98 34 3131 5072

##### Email address

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#### Recruitment status

**Recruitment complete**

#### Funding source

#### Expected recruitment start date

2015-11-22, 1394/09/01

#### Expected recruitment end date

2016-12-30, 1395/10/10

#### Actual recruitment start date

2016-01-02, 1394/10/12

#### Actual recruitment end date

2016-12-30, 1395/10/10

#### Trial completion date

2017-09-22, 1396/06/31

#### Scientific title

The effect of upper extremity mental imagery exercise on rehabilitation of upper extremity motor imagery and

movement in multiple sclerosis patients

## Public title

The effect of mental training in multiple sclerosis patients

## Purpose

Supportive

## Inclusion/Exclusion criteria

### Inclusion criteria:

1. They were definitely diagnosed with MS according to neurological examinations by a specialist based on the international revised McDonald's Criteria These individuals belonged to relapsing remitting MS sub-group based on the National MS Society division

### Exclusion criteria:

## Age

From **20 years** old to **40 years** old

## Gender

Both

## Phase

N/A

## Groups that have been masked

*No information*

## Sample size

Target sample size: **30**

Actual sample size reached: **37**

## Randomization (investigator's opinion)

Not randomized

## Randomization description

## Blinding (investigator's opinion)

Not blinded

## Blinding description

## Placebo

Used

## Assignment

Parallel

## Other design features

## Secondary Ids

empty

## Ethics committees

### 1

#### Ethics committee

##### Name of ethics committee

Ethics committee of Kerman University of Medical Sciences

##### Street address

Kerman, Somayeh Road, Beginning of Jahad Boulevard, Alley No. 1, in front of the Besat Clinic, Neuroscience Research Center

##### City

Kerman

##### Province

Kerman

##### Postal code

7619813159

#### Approval date

2014-09-23, 1393/07/01

## Ethics committee reference number

IR.KUMS.REC.1393.1

## Health conditions studied

### 1

#### Description of health condition studied

Multiple sclerosis

#### ICD-10 code

#### ICD-10 code description

## Primary outcomes

### 1

#### Description

Manual dexterity according to completing of 9-Hole Peg Test (9-HPT)

#### Timepoint

before intervention and 10 days after intervention

#### Method of measurement

9-Hole Peg Test (9-HPT) evaluated manual dexterity in MS patients.

### 2

#### Description

Manual dexterity according to transferred cubes in The Box and Block Test (BBT)

#### Timepoint

before intervention and 10 days after intervention

#### Method of measurement

The Box and Block Test (BBT) evaluated manual dexterity in MS patients.

### 3

#### Description

Motor imagery ability based on score of Kinesthetic and Visual Imagery Questionnaire (KVIQ-20)

#### Timepoint

before intervention and 10 days after intervention

#### Method of measurement

Motor imagery ability was assessed by Kinesthetic and Visual Imagery Questionnaire (KVIQ-20).

### 4

#### Description

Motor imagery ability based on reaction time of hand mental rotation task (HMRT)

#### Timepoint

before intervention and 10 days after intervention

#### Method of measurement

Motor imagery ability was assessed hand mental rotation task (HMRT)

### 5

#### Description

Motor imagery ability based on response accuracy rate of

hand mental rotation

**Timepoint**

before intervention and 10 days after intervention

**Method of measurement**

Motor imagery ability was assessed hand mental rotation task (HMRT).

**6**

**Description**

Motor imagery ability based on chronometry on BBT

**Timepoint**

before intervention and 10 days after intervention

**Method of measurement**

Motor imagery ability was assessed by chronometry on BBT .

**Secondary outcomes**

empty

**Intervention groups**

**1**

**Description**

Intervention group: 70 minutes for each motor imagery (MI) training session split into two 30-minute periods of MI training via 10 minutes of rest. Session duration changed in response to patient feedback .For each MI training session, patients sat on a chair at a table in a position that: The hips, the knees and the ankles were at 90 degrees angle with straight sitting position; The forearms were on a resting state on the table without rising or falling shoulder girdle; During the MI training, patients held their hands position coordinated whit MI task (upward, downward, or in-between modes).

**Category**

Rehabilitation

**2**

**Description**

Control group: During the ten days of the experiment, no physical and mental exercises were performed and tests were performed without any intervention before and after ten days.

**Category**

Other

**Recruitment centers**

**1**

**Recruitment center**

**Name of recruitment center**

Kerman MS Society

**Full name of responsible person**

Dr. Alireza Honarmand

**Street address**

Boulevard Kosar, adjacent to the Therapy Center , Unit 11 shafa

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mahdieh.azin@gmail.com

**Sponsors / Funding sources**

**1**

**Sponsor**

**Name of organization / entity**

Kerman neuroscience center

**Full name of responsible person**

Dr. Mohammad Shabani

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Kerman, Somayeh Road, Beginning of Jahad Boulevard, Alley No. 1, in front of Besat Clinic

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shabanimoh@yahoo.com

**Grant name**

Kerman neuroscience center

**Grant code / Reference number**

Grant number: KNRC/93-1

**Is the source of funding the same sponsor organization/entity?**

Yes

**Title of funding source**

Kerman neuroscience center

**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**

Rafsanjan University of Medical Sciences

**Full name of responsible person**

Mahdieh Azin

**Position**

Assistant Professor of Neuroscience

**Latest degree**

Ph.D.

**Other areas of specialty/work**

Neuroscience

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## Person responsible for scientific inquiries

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## Person responsible for updating data

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## Sharing plan

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

No - There is not a plan to make this available

**Justification/reason for indecision/not sharing IPD**

There is no further information

**Study Protocol**

No - There is not a plan to make this available

**Statistical Analysis Plan**

No - There is not a plan to make this available

**Informed Consent Form**

No - There is not a plan to make this available

**Clinical Study Report**

No - There is not a plan to make this available

**Analytic Code**

No - There is not a plan to make this available

**Data Dictionary**

No - There is not a plan to make this available