# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

22 Nov 2026

## The effectiveness of motor learning based mirror therapy on the hand function of 7 to 12-year-old children with hemiplegic cerebral palsy

## Protocol summary

**Study aim**
To explore of the effectiveness of motor learning based mirror therapy on the hand function of 7 to 12-year-old children with hemiplegic cerebral palsy

**Design**
Single-blinded two arm parallel group randomized control trial

**Settings and conduct**
After obtaining the necessary licenses and submitting them to the relevant centers (Rehabilitation Centers affiliated to Isfahan University of Medical Sciences and Asude Mawa Charitable Association), according to the inclusion and exclusion criteria of the participants, a sampling frame will be prepared. In the next step, among all eligible children, thirty 7 to 12 years old children with unilateral cerebral palsy will selected randomly. After the pre-test, they will be randomly assigned to two groups of mirror therapy based on the principles of motor learning and common mirror therapy (participants, testers, and statistical analysts will be blinded), then the post-test is performed and finally the results are analyzed statistically. In order to follow-up one month after the post-test, participants will be assessed for a third time.

**Participants/Inclusion and exclusion criteria**
Diagnosis of partial cerebral palsy based on the MACS grading scale, participants have the hand function ability to rank 1 to 3. Having at least intelligence 70 based on the Raven's Colored Progressive Matrices. Health problems unrelated to cerebral palsy. Treatment-resistant epilepsy. Visual problems that interfere with the performance of the intervention or test Muscle tone above 3.5 (mean for elbow and wrist joint movements) based on modified Ashworth Scale.

**Intervention groups**
Motor learning based mirror therapy; Common mirror therapy

**Main outcome variables**
Uni-manual function; bi-manual skills; grasp strength; tactile discrimination; passive range of motion (P-ROM); active range of motion (A-ROM); parent perception; dexterity; bilateral coordination; visual-motor control

## General information

**Reason for update**

**Acronym**

**IRCT registration information**
IRCT registration number: **IRCT20200224046604N1**
Registration date: **2020-03-15, 1398/12/25**
Registration timing: **prospective**

Last update: **2020-03-15, 1398/12/25**
Update count: **0**

**Registration date**
2020-03-15, 1398/12/25

**Registrant information**

**Name**
Hossein Sourtiji

**Name of organization / entity**

**Country**
Iran (Islamic Republic of)

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**Recruitment status**
**Recruitment complete**

**Funding source**

**Expected recruitment start date**
2020-04-03, 1399/01/15

**Expected recruitment end date**
2020-04-24, 1399/02/05

**Actual recruitment start date**
empty

**Actual recruitment end date**
empty

**Trial completion date**
empty

**Scientific title**
The effectiveness of motor learning based mirror therapy on the hand function of 7 to 12-year-old children with hemiplegic cerebral palsy

**Public title**
Effect of mirror therapy on hand of children with cerebral oalsy

**Purpose**
Treatment

**Inclusion/Exclusion criteria**

**Inclusion criteria:**
Diagnosis of partial cerebral palsy Based on the MACS grading scale, participants have the hand function ability to rank 1 to 3. Having at least intelligence 70 based on the Raven's Colored Progressive Matrices

**Exclusion criteria:**
Health problems unrelated to cerebral palsy Treatment-resistant seizures Visual problems that interfere with the intervention or test. Muscle tone above 3.5 (mean for elbow and wrist joint movements) based on modified Ashworth Scale

**Age**
From **7 years** old to **12 years** old

**Gender**
Both

**Phase**
N/A

**Groups that have been masked**

- Participant
- Outcome assessor
- Data analyser

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

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

**Randomization description**
Sealed envelopes. Participants will choose one envelope between two separate envelopes. It is noteworthy that in each envelope there is a sheet in which the name of one of the groups is written.

**Blinding (investigator's opinion)**
Single blinded

**Blinding description**
Participants, data analyzer, and outcome elevator will not know which of the participants belonged to the intervention group and which one was in the comparison group.

**Placebo**
Not used

**Assignment**
Parallel

**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

**Ethics committee**

**Name of ethics committee**
The institutional research ethics committee of vice-chancellor of Isfahan University of medical scie

**Street address**
Hezar Jarib Ave

**City**
Isfahan

**Province**
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**Postal code**
8174673461

**Approval date**
2020-02-05, 1398/11/16

**Ethics committee reference number**
IR.MUI.RESEARCH.REC.1398.618

## Health conditions studied

### 1

**Description of health condition studied**
cerebral palsy

**ICD-10 code**
G81

**ICD-10 code description**
Hemiplegia and hemiparesis

## Primary outcomes

### 1

**Description**
Hand function

**Timepoint**
Before the intervention, after the intervention, one month after the post-test

**Method of measurement**
Bruininks-Oseretsky test of motor proficiency, Jebsen–Taylor Hand Function Test

## Secondary outcomes

### 1

**Description**
Grasp strength

**Timepoint**
Before the intervention, after the intervention, one month after the post-test

**Method of measurement**
Vigorimeter

### 2

**Description**
Two-point discrimination

**Timepoint**
Before the intervention, after the intervention, one month after the post-test
**Method of measurement**
Two-point discrimination scale

**3**

**Description**
Active and passive range of motion
**Timepoint**
Before the intervention, after the intervention, one month after the post-test
**Method of measurement**
Goniometry

**4**

**Description**
Parent perception
**Timepoint**
Before the intervention, after the intervention, one month after the post-test
**Method of measurement**
Caregiver Functional Use Survey (CFUS)

**5**

**Description**
Visual motor coordination
**Timepoint**
Caregiver Functional Use Survey (CFUS)
**Method of measurement**
Bruininks-Oseretsky test of motor proficiency

## Intervention groups

**1**

**Description**
Intervention group: Motor learning based mirror therapy that is designed based on the principles of motor learning including behavior shaping, types and grading of the tasks and types of practice. Intervention protocol will consist of twenty 30-45 minute sessions for 7 weeks and 3 sessions per week.
**Category**
Rehabilitation

**2**

**Description**
Control group: Common mirror therapy intervention consists of 3 repetitions of 10 sets of 7 symmetrical motor tasks and simultaneously upper limb and hand. Exercises include fine motor exercises, full range of motion exercises, and finger and forearm strength exercises.Intervention protocol will consist of twenty 30-45 minute sessions for 7 weeks and 3 sessions per week.
**Category**
Rehabilitation

## Recruitment centers

**1**

**Recruitment center**
**Name of recruitment center**
Rehabilitation faculty, Isfahan University of medical sciences
**Full name of responsible person**
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## Sponsors / Funding sources

**1**

**Sponsor**
**Name of organization / entity**
Esfahan University of Medical Sciences
**Full name of responsible person**
Dr Shaghayegh Haghjooy Javanmard
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research@mui.ac.ir
**Grant name**
**Grant code / Reference number**
**Is the source of funding the same sponsor organization/entity?**
Yes
**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**
Hossein Sourtiji
**Position**
Assistant Professor
**Latest degree**
Ph.D.
**Other areas of specialty/work**
Occupational Therapy
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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)**
Yes - There is a plan to make this available
**Study Protocol**
Yes - There is a plan to make this available
**Statistical Analysis Plan**
Yes - There is a plan to make this available
**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**
Yes - There is a plan to make this available
**Data Dictionary**
Yes - There is a plan to make this available
**Title and more details about the data/document**
Statistical indicators related to the total data
**When the data will become available and for how long**
Start of access period from 2022
**To whom data/document is available**
Researchers working in academic and scientific institutions
**Under which criteria data/document could be used**
If data is needed for systematic review (meta-analysis) studies.
**From where data/document is obtainable**
Hossein Sourtiji Occupational therapy department, Rehabilitation sciences faculty, Isfahan University of medical sconces 00983137925049
**What processes are involved for a request to access data/document**
Request from the applicant's person or organization Approved by the President of the University, Approved by the head of the faculty
**Comments**