Clinical Trial Protocol
Iranian Registry of Clinical Trials

16 Sep 2026

The effect of transcranial Direct Current Stimulation (tDCS) on the motor skill of remote control operators in a human-robot interactive task

Protocol summary

Study aim
Determining the effect of transcranial Direct Current Stimulation (tDCS) on the motor skill of remote control operators in a human-robot interactive task

Design
The present design is a randomized, single-blinded, sham-controlled intervention study at 40 healthy young adults. Randomization using the related statistical software, by random blocks method of size four

Settings and conduct
Before and after applying any type of stimulation, the performance of individuals while performing a human-robot interactive task will be evaluated and the individuals' performance indicators will be recorded. The changes in these indicators in the post-test compared to the pre-test between the groups receiving the real and sham stimulation will be compared to determine the effects of transcranial Direct Current Stimulation During the sessions, subjects are unaware of the type of received stimulation. The study will be performed at IUMS.

Participants/Inclusion and exclusion criteria
Inclusion criteria : Age 20 to 35 years old, Right-handed, Non-smoker, Normal vision, No alcohol and drugs use during the last three months so far or caffeine in the previous 3 hours, Enough sleep in the last 12 hours Exclusion criteria : Suffering from skin diseases or other diseases, History of severe head injury, seizures, fainting, epilepsy, migraine, brain trauma or a neurosurgical brain intervention, High blood pressure, Use of any metal objects implanted in the brain or having a tattoos or non-removable metal around the head, Having a pacemakers or centrally acting drugs, Pregnancy or breastfeeding

Intervention groups
Twenty subjects will receive real stimulation and twenty others will receive sham stimulation

Main outcome variables
The correct performing number of human-robot interactive task, the total number of errors while performing the tasks

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20180902040923N3**
Registration date: **2022-06-13, 1401/03/23**
Registration timing: **registered_while_recruiting**

Last update: **2022-06-13, 1401/03/23**
Update count: **0**

Registration date
2022-06-13, 1401/03/23

Registrant information

Name
Mohamad Sadegh Ghasemi

Name of organization / entity

Country
Iran (Islamic Republic of)

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+98 21 8670 4839

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ghasemi.m@iums.ac.ir

Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2022-05-29, 1401/03/08

Expected recruitment end date
2022-07-21, 1401/04/30

Actual recruitment start date
empty

Actual recruitment end date
empty

Trial completion date
empty

Scientific title
The effect of transcranial Direct Current Stimulation (tDCS) on the motor skill of remote control operators in a human-robot interactive task

Public title
The effect of transcranial Direct Current Stimulation (tDCS) on the motor skill of remote control operators in a human-robot interactive task

Purpose
Supportive

Inclusion/Exclusion criteria

Inclusion criteria:
Age 20 to 35 years old Right-handed Non-smoker Normal or corrected vision No alcohol and drugs use during the last three months so far Having enough sleep in the last 12 hours No caffeine consumption in the previous 3 hours

Exclusion criteria:
Suffering from skin diseases or sensitive scalp skin Suffering from neurological and mental illness History of severe head injury, brain trauma or a neurosurgical brain intervention History of seizures, fainting, epilepsy, migraine or frequent headaches High blood pressure Suffering from pulmonary, cardiac, liver or kidney diseases Use of any metal implants Use of centrally acting drugs, neuropsychotropic or with an effect on brain plasticity drugs Pregnancy or breastfeeding Use of electrodes or metal objects implanted in the brain Having a tattoos or non-removable metal around the head Having a heart battery or pacemaker

Age
From **20 years** old to **35 years** old

Gender
Both

Phase
N/A

Groups that have been masked

- Participant

Sample size
Target sample size: **40**

Randomization (investigator's opinion)
Randomized

Randomization description
Randomization by random blocks method of size four will be done using the related statistical software. Based on the conducted randomization, 40 identical envelopes are prepared with consecutive numbering from 1 to 40, in which the type of Stimulation received is listed. In order of the entry of subjects to the study an envelope will be assigned to the individuals. Each person will be placed in one of the groups receiving real or sham transcranial Direct Current Stimulation (tDCS).

Blinding (investigator's opinion)
Single blinded

Blinding description
During the sessions, subjects are unaware of the type of received transcranial Direct Current Stimulation (real or sham tDCS).

Placebo
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
Iran University of Medical Sciences, Next to Milad Tower, Hemmat Hwy

City
Tehran

Province
Tehran

Postal code
1449614535

Approval date
2022-05-09, 1401/02/19

Ethics committee reference number
IR.IUMS.REC.1401.102

Health conditions studied

1

Description of health condition studied

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description
The correct performing number of human-robot interactive task

Timepoint
Before and after applying real and sham transcranial Direct Current Stimulation

Method of measurement
Arduino Uno Data Logger 8 bit

2

Description
The total number of errors while performing the tasks

Timepoint
Before and after applying real and sham transcranial Direct Current Stimulation

Method of measurement

Arduino Uno Data Logger 8 bit

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group: twenty subjects will receive real transcranial Direct Current Stimulation (real tDCS). The anode electrode is placed over the left primary motor cortex (c3) and the cathode electrode is placed as the reference electrode over the right supraorbital (fp2). 2 mA for 20 minutes (one session)
Category
Rehabilitation

2

Description
Control group: twenty subjects will receive sham transcranial Direct Current Stimulation (sham tDCS) The anode electrode is placed over the left primary motor cortex (c3) and the cathode electrode is placed over the right supraorbital (fp2) for 20 minutes. (one session) Current intensity : 0
Category
Placebo

Recruitment centers

1

Recruitment center
Name of recruitment center
Iran University of Medical Sciences
Full name of responsible person
Fateme Ziafati
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School of Health, Iran University of Medical Sciences, Next to Milad Tower, Hemmat Hwy
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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
Iran University of Medical Sciences
Full name of responsible person
Mohamad Sadegh Ghasemi
Position
Associate Professor
Latest degree
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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 more information
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
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