

Clinical Trial Protocol

Iranian Registry of Clinical Trials

10 Jun 2026

The effect of a selected physical fitness with and without transcranial direct current stimulation (tDCS) on reaction time and shooting performance in officer students

Protocol summary

Study aim

With the aim of comparing the effect of a period of selected physical training exercises with and without transcranial direct electrical stimulation of the brain (tDCS) on reaction time and shooting performance in officer students.

Design

36 students are randomly divided into 3 groups of physical fitness without tDCS, physical fitness with tDCS and placebo group. Sampling is done randomly. The total sample size will be 36 people. The clinical trial will have a control group with parallel groups.

Settings and conduct

The research will be done in Afsari University. The number of stimulation and training sessions will be 10 sessions in total.

Participants/Inclusion and exclusion criteria

Among the criteria for entering the research, students were familiar with shooting techniques, no smoking, no history of cardiovascular disease, blood, liver, respiratory diseases, and no use of energizing supplements and androgenic drugs. The criterion for not entering the study was that the subject was not able to perform the physical fitness test or perform other psychological exercises at the same time as the psychological interventions of the current study.

Intervention groups

36 students are randomly divided into 3 groups of physical fitness without tDCS, physical fitness with tDCS and placebo group. The physical fitness group without tDCS does physical fitness exercises in 10 sessions and each session lasts 60 minutes. In the physical fitness group with tDCS, participants will receive and perform 10 sessions of tDCS along with physical fitness exercises. The placebo group will also receive 10 sessions of sham tDCS stimulation.

Main outcome variables

Reaction time, shooting accuracy

General information

Reason for update

Acronym

tDCS

IRCT registration information

IRCT registration number: **IRCT20240213060991N1**

Registration date: **2024-04-12, 1403/01/24**

Registration timing: **retrospective**

Last update: **2024-04-12, 1403/01/24**

Update count: **0**

Registration date

2024-04-12, 1403/01/24

Registrant information

Name

Mehdi Rahimzadeh

Name of organization / entity

The University of Tehran

Country

Iran (Islamic Republic of)

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2024-02-18, 1402/11/29

Expected recruitment end date

2024-03-19, 1402/12/29

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The effect of a selected physical fitness with and without transcranial direct current stimulation (tDCS) on reaction time and shooting performance in officer students

Public title

Effect of brain electrical stimulation on shooting performance

Purpose

Education/Guidance

Inclusion/Exclusion criteria**Inclusion criteria:**

Third and fourth year students (familiar with shooting techniques) No smoking No history of cardiovascular disease, blood, liver, or respiratory diseases Not using energizing supplements and androgenic drugs

Exclusion criteria:

Unwillingness to participate in research Has a history of illness Age above 24 years

Age

From **20 years** old to **24 years** old

Gender

Male

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **36**

Randomization (investigator's opinion)

Randomized

Randomization description

In this study, the purposeful sampling method is used. The random number table method will be used to assign people to two experimental and control groups. In this method, a list of people (third and fourth year entering the university) who want to be selected as a sample is prepared. Determining a random list To perform a simple random sampling, the Random Number Generator tool in Google is used. The randomization unit is also individual. The control/experimental group ratio will be 1:1.

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 Sport Sciences Research Institute

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No. 3, 5th Alley, Miremad Street, Motahhari Street, Tehran, Iran

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Approval date

2024-01-19, 1402/10/29

Ethics committee reference number

IR.SSRC.REC.1402.292

Health conditions studied**1****Description of health condition studied**

A specific disease is not investigated in this study

ICD-10 code**ICD-10 code description****Primary outcomes****1****Description**

Simple and selective reaction time based on time measurement in milliseconds

Timepoint

The measurement at the beginning of the study will be the pre-test value and 30 days after the start of the study will be the post-test value.

Method of measurement

The way to measure the variable of simple and selective reaction time will be the Deary-Liewald test, which is in milliseconds.

2**Description**

Shooting performance variable based on the score received on the shooting score

Timepoint

The measurement at the beginning of the study will be the pre-test value and 30 days after the start of the study will be the post-test value.

Method of measurement

The shooting performance will be measured according to the accuracy of the shooting and the score obtained from the shooting on the recorder.

Secondary outcomes

empty

Intervention groups

1

Description

The first intervention group: physical fitness exercises without transcranial direct electrical stimulation of the brain (tDCS)

Category

Behavior

2

Description

The second intervention group: physical fitness exercises with transcranial direct electrical stimulation of the brain (tDCS)

Category

Behavior

3

Description

Control group: sham tDCS stimulation in the form of placebo or sham group

Category

Placebo

Recruitment centers

1

Recruitment center

Name of recruitment center

دانشگاه افسری امام علی (ع)

Full name of responsible person

مهدی رحیم زاده

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

The University of Shahid Satari

Full name of responsible person

Mohammad Esmaeili

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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

The University of Shahid Satari

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

The University of Shahid Satari

Full name of responsible person

Mehdi Rahimzadeh

Position

elite soldier

Latest degree

Ph.D.

Other areas of specialty/work

Psychology

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Other areas of specialty/work

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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

The data is related to a group of military soldiers of the army and according to the security protocols, it is not possible to publish them

Study Protocol

Yes - There is 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

Yes - There is a plan to make this available

Clinical Study Report

Yes - There is a plan to make this available

Analytic Code

No - There is not a plan to make this available

Data Dictionary

Not applicable

Title and more details about the data/document

The study protocol, the clinical study report and the informed consent form will be available to the public in the form of an article published in the journal after the completion of the research.

When the data will become available and for how long

The time to access the documents of this study will be immediately after publication in a valid scientific journal.

To whom data/document is available

The final report of the study and its results will be published in a publication that can be used by both academics and people working in military environments.

Under which criteria data/document could be used

The documents and results obtained from the study will be accessible to the public and experts, but the data of individuals that are not directly reported in the article will not be accessible due to the security of the research participants.

From where data/document is obtainable

It will be available through the website of the journal in which the study is published as a research paper, and also by sending an email to the authors of the study.

What processes are involved for a request to access data/document

One of these processes is visiting the website of the journal where the study is published. Also, another process is to send the request for the content needed by the audience to the email of the research authors.

Comments**Person responsible for updating data****Contact****Name of organization / entity**

The University of Tehran

Full name of responsible person

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Position

PhD in Sports Psychology

Latest degree

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Other areas of specialty/work

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