Clinical Trial Protocol
Iranian Registry of Clinical Trials

08 Nov 2026

Comparison of the Effectiveness of Perceptual-Motor Training and tDCS on Executive Functions and Motor Skills in Children with Attention Deficit Hyperactivity Disorder (ADHD)

Protocol summary

Study aim
Comparison and Differences Between Perceptual-Motor Training and tDCS on Executive Functions and Motor Skills in Children with Attention Deficit Hyperactivity Disorder

Design
The total sample size consists of 45 participants, divided into three groups of 15. Two groups will receive the training, while one control group will be randomly assigned. The study will be conducted in parallel groups in a semi-clinical manner.

Settings and conduct
This research will be conducted in a clinic that has children with Attention Deficit Hyperactivity Disorder (ADHD).

Participants/Inclusion and exclusion criteria
Children with Attention Deficit Hyperactivity Disorder (ADHD), aged 7 to 10 years

Intervention groups
Perceptual-motor exercises The transcranial direct current stimulation

Main outcome variables
Memory with N-BACK test: cognitive acceptance task with Wisconsin test: response inhibition with Stroop test and motor skills with Ulrich test

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20250208064687N1**
Registration date: **2025-04-16, 1404/01/27**
Registration timing: **prospective**

Last update: **2025-04-16, 1404/01/27**
Update count: **0**

Registration date
2025-04-16, 1404/01/27

Registrant information

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Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2025-04-20, 1404/01/31

Expected recruitment end date
2025-06-21, 1404/03/31

Actual recruitment start date
empty

Actual recruitment end date
empty

Trial completion date
empty

Scientific title
Comparison of the Effectiveness of Perceptual-Motor Training and tDCS on Executive Functions and Motor Skills in Children with Attention Deficit Hyperactivity Disorder (ADHD)

Public title
The Effect of Perceptual-Motor Training and tDCS on Executive Function and Motor Skills in Children with ADHD

Purpose
Prevention
Inclusion/Exclusion criteria
Inclusion criteria:
With ADHD Disorder
Exclusion criteria:
Having Other Diseases and Disorders Range outside the age range of 7-10 years
Age
From **7 years** old to **10 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
Simple Randomization Using SPSS Software The following steps will be followed for simple randomization using SPSS software: First, a random variable will be created using the Transform > Compute Variable tool. This variable will be defined using the formula Trunc(RV.Uniform(0,1)*3)+1, which randomly assigns individuals to one of three groups (1, 2, or 3). The data will then be sorted based on this variable using the Data > Sort Cases tool. Finally, participants will be randomly divided into three groups: the control group (number 1) and two experimental groups (numbers 2 and 3). This method is a simple and transparent form of randomization, which will be used in the future for the implementation of the study.
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
Research Ethics Committee of Islamic Azad University, Sari Branch
Street address
Pasdaran Street, Kamal Elmak Street, Gino Complex
City
sanandaj
Province
Kurdistan
Postal code
6617635413
Approval date
2024-07-30, 1403/05/09
Ethics committee reference number
IR.IAU.SARI.REC.1403.219

Health conditions studied

1

Description of health condition studied
Attention Deficit Hyperactivity Disorder
ICD-10 code
F90.0
ICD-10 code description
Attention-deficit hyperactivity disorder, predominantly inattentive type

Primary outcomes

1

Description
Motor skills
Timepoint
Before the start of the intervention and after 8 weeks of intervention
Method of measurement
Ulrich Test (Third Edition)

2

Description
working memory
Timepoint
Before the start of the intervention and after 8 weeks of intervention
Method of measurement
N-Back Test

3

Description
Cognitive flexibility
Timepoint
Before the start of the intervention and after 8 weeks of intervention
Method of measurement
Wisconsin test

4

Description
Response inhibition
Timepoint
Before the start of the intervention and after 8 weeks of intervention
Method of measurement
Stroop test

Secondary outcomes

empty

Intervention groups

1

Description

The study was conducted in accordance with the latest version of the Declaration of Helsinki and approved by the Ethics Committee of the University of Tehran. The method of collecting data for the present study was fieldwork. Initially, written informed consent was obtained from the parents. Children also verbally expressed their willingness to participate in the study. Then, the participants were introduced to the objectives of the study and the scoring and implementation of the desired tests. Subsequently, the participants were randomly assigned to one of the tDCS stimulation group (1) and perceptual-motor training group (2). The present study included pre-test, intervention (practice), and post-test stages. Assessments were conducted before the start of the interventions and in the session after the interventions by another occupational therapist. This assessor was unaware of the objectives and content of the sessions during the study process, and after familiarization, in the pre-test stage, the Ulrich test (3rd edition) and the executive functions test (Stroop, Wisconsin, and N-back) were administered to the children in accordance with the existing guidelines, and then the parents completed the standard ADHD questionnaire. The intervention phase was conducted in 24 sessions. In the tDCS direct electrical stimulation group, participants received 24 sessions of 30-minute electrical stimulation of the DLPFC (F4-F3) and the primary motor cortex (M1) (C4-C3) (in this way, in anodic electrical stimulation, a direct current of 1.5 milliamperes is applied to the individual throughout the entire duration of the stimulation). The sessions were conducted 3 days a week. In the perceptual-motor training group, which was also conducted in 24 sessions of 45 minutes each session, 3 days a week, the participants performed the relevant exercises. The 10-20 International System was used to find the points. Immediately after the last session, the post-test phase was conducted in which the participants performed the desired tests.

Category

Behavior

2

Description

Control group: Group 3 was the control group, which received no intervention.

Category

Behavior

3

Description

Intervention group: Intervention group: Perceptual-motor exercises: The present study included pre-test, intervention (practice), and post-test phases. Assessments were conducted by another occupational therapist before the intervention and in the session after the intervention. The subjects were unaware of the concepts and content of the sessions during the study process, and after familiarization, in the pre-test phase, the Ulrich test (3rd edition) and the executive functions test (Stroop, Wisconsin, and N-back) were administered according to the existing instructions, and then the parents completed the standard attention deficit hyperactivity disorder questionnaire. The intervention phase consisted of 24 sessions. In the perceptual-motor exercises group, which was conducted in 24 sessions, each session lasting 45 minutes, 3 days a week, the participants performed the exercises. After the last session, the post-test phase was conducted in which the participants performed the desired tests.

Category

Behavior

Recruitment centers

1

Recruitment center

Name of recruitment center
Clinic Alan

Full name of responsible person
Zahad Mantashloo

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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?

No

Title of funding source

خود شخص مسول

Proportion provided by this source

100

Public or private sector

Private

Domestic or foreign origin

Domestic

Category of foreign source of funding

empty

Country of origin

Type of organization providing the funding

Other

Person responsible for general inquiries

Contact

Name of organization / entity

University of Tahran

Full name of responsible person

Reza Shadfar

Position

Professor of the Right to teach

Latest degree

Master

Other areas of specialty/work

Sport Medicine

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Sharing plan

Deidentified Individual Participant Data Set (IPD)

Undecided - It is not yet known if there will be 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

Not applicable

Analytic Code

Not applicable

Data Dictionary

Not applicable