Clinical Trial Protocol
Iranian Registry of Clinical Trials

08 Nov 2026

Virtual Reality–Based and In-Person Martial Arts Training for Executive Functioning in Boys With Conduct Disorder: A Three-Arm Randomized Controlled Trial

Protocol summary

Study aim
This study will compare the effects of VR-based and in-person martial arts training with a no-exercise control condition on parent-reported executive functioning in boys aged 7–11 years with conduct disorder, immediately after the intervention and at a 30-day follow-up.

Design
This three-arm parallel randomized controlled trial will include 135 participants allocated by block randomization (1:1:1), with allocation concealed in numbered, opaque, sealed envelopes. Questionnaire administration and data entry staff will be blinded. Assessments will occur at baseline, week 7, and 30 days later. Trial phase will not apply.

Settings and conduct
The study will take place at a pediatric rehabilitation center and a martial arts club in Chengdu, China. Training will be supervised; questionnaire administration and data entry staff will be blinded to group allocation.

Participants/Inclusion and exclusion criteria
Participants will be 135 boys aged 7–11 years with clinically confirmed conduct disorder; eligibility will require the ability to exercise safely, no contraindications to VR exposure, parental consent, and child assent; children with major neurological disorders, severe sensory or motor impairments, acute psychiatric instability, or any comorbid psychiatric diagnosis will not be enrolled.

Intervention groups
Participants will be allocated to three groups of 45; the VR group will receive martial arts training using Pico 4 Enterprise headsets; the in-person group will receive supervised martial arts training at a club; both programs will include 21 sessions over 7 weeks, three sessions per week, lasting 30–50 minutes each; the control group will continue usual activities without study-provided exercise training.

Main outcome variables
Behavioral, emotional, and cognitive regulation and overall executive functioning will be assessed using the parent-report BRIEF-2.

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20261006071316N1**
Registration date: **2026-10-08, 1405/07/16**
Registration timing: **retrospective**

Last update: **2026-10-08, 1405/07/16**
Update count: **0**

Registration date
2026-10-08, 1405/07/16

Registrant information

Name
Fatemeh Mirzaei Koli

Name of organization / entity

Country
Iran (Islamic Republic of)

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solalll.19966@gmail.com

Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2026-05-07, 1405/02/17

Expected recruitment end date
2026-06-07, 1405/03/17

Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Virtual Reality–Based and In-Person Martial Arts Training for Executive Functioning in Boys With Conduct Disorder: A Three-Arm Randomized Controlled Trial

Public title
Effects of virtual reality and in-person martial arts training on executive functioning in boys with conduct disorder
Purpose
Supportive
Inclusion/Exclusion criteria
Inclusion criteria:
Participants will be boys aged 7–11 years Conduct disorder will be confirmed by a licensed child psychologist or psychiatrist using DSM diagnostic criteria Participants will be physically able to safely perform moderate-to-vigorous physical activity Participants will have no contraindications to virtual reality exposure Written informed consent will be obtained from a parent or legal guardian Age-appropriate assent will be obtained from each child
Exclusion criteria:
Children with major neurological disorders will not be enrolled Children with severe sensory or motor impairments will not be enrolled Children with acute psychiatric instability requiring immediate intervention will not be enrolled Children with any comorbid psychiatric diagnosis, including ADHD, oppositional defiant disorder, or anxiety disorders, will not be enrolled
Age
From **7 years** old to **11 years** old
Gender
Male

Phase
N/A
Groups that have been masked
No information
Sample size
Target sample size: **135**
Randomization (investigator's opinion)
Randomized
Randomization description
After baseline assessment, participants will be individually allocated to the VR-based martial arts, in-person martial arts, or control group in a 1:1:1 ratio using block randomization. An independent researcher who will not be involved in recruitment, intervention delivery, or outcome assessment will generate the random allocation sequence before allocation. Assignments will be concealed in sequentially numbered, opaque, sealed envelopes, which will be opened in order after baseline assessment to reveal each participant’s allocation.
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 the Sport Sciences Research Institute (SSRI)
Street address
No. 3, Fifth Alley (Sedrus), Mir Emad St., Shahid Motahari St., Abbas Abad–Andisheh Neighborhood
City
Tehran
Province
Tehran
Postal code
1587958711
Approval date
2026-05-03, 1405/02/13
Ethics committee reference number
IR.SSRC.REC.1404.029

Health conditions studied

1

Description of health condition studied
Conduct disorder
ICD-10 code
F91.9
ICD-10 code description
Conduct disorder, unspecified

Primary outcomes

1

Description
The Behavior Regulation Index (BRI) T-score will be assessed using the BRIEF-2 Parent Form.
Timepoint
Measurements will be taken at baseline before the intervention, immediately after the 7-week intervention, and 30 days after its completion.
Method of measurement
The Parent Form of the Behavior Rating Inventory of Executive Function, Second Edition, will be completed by a parent or legal guardian to obtain the standardized score for the Behavior Regulation Index.

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group 1: Participants will receive supervised virtual reality–based martial arts training using Pico 4 Enterprise headsets at a pediatric rehabilitation center. The program will include 21 sessions over 7 weeks, three sessions per week, lasting 30–50 minutes each. Sessions will comprise 5–10 minutes of warm-up, 20–30 minutes of striking, footwork, balance, coordination, and progressively complex movement sequences, followed by 5–10 minutes of cool-down and reflection. Two certified martial arts instructors will supervise moderate-intensity training and monitor discomfort. Virtual reality exposure will be paused or stopped if moderate or severe symptoms occur.
Category
Rehabilitation

Recruitment centers

1

Recruitment center
Name of recruitment center
Roozbeh Hospital, Tehran University of Medical Sciences
Full name of responsible person
Ali saberi
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Roozbeh Hospital, South of Lashgar Intersection, South Kargar St., Tehran, Iran
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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
university of tehran
Proportion provided by this source
10
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
Tehran University of Medical Sciences
Full name of responsible person
Fatemeh Mirzaei
Position
Researcher
Latest degree
Master
Other areas of specialty/work
Sport Medicine
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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
No - There is not 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
De-identified participant-level data underlying the reported results will be shared, including group allocation and executive-function scores at baseline, post-intervention, and 30-day follow-up. Names, contact details, and other identifying information will be removed.

When the data will become available and for how long
Data will be available upon reasonable request from six months after publication of the main study results for a period of five years.

To whom data/document is available
Qualified researchers from academic, scientific, or industry institutions will be eligible to request access. Access will require an approved research proposal and a signed data-use agreement protecting participant confidentiality.

Under which criteria data/document could be used
Data will be used only for approved secondary analyses, verification of findings, or meta-analyses. Requests will specify the research aim, required variables, and analysis plan. Users will maintain secure storage, make no attempt to identify participants, and neither redistribute the data nor use them beyond the approved purpose.

From where data/document is obtainable
Requests will be submitted by email to Fatemeh Mirzaei at solalll.19966@gmail.com. Applicants will provide their name, institutional affiliation, research proposal, required data, and analysis plan

What processes are involved for a request to access data/document
Applicants will email Fatemeh Mirzaei at solalll.19966@gmail.com, providing their institutional affiliation, research aim, required data, and analysis plan. Requests will be reviewed within four weeks. Following approval and signing of a data-use agreement, de-identified data will be transferred securely within two weeks. For complete requests, the entire process will take up to six weeks.

Comments