

Clinical Trial Protocol

Iranian Registry of Clinical Trials

10 Jun 2026

The effect of taekwondo training on body composition, brain-derived neurotrophic factor and cognitive function of adolescent girls

Protocol summary

Study aim

The purpose of this research is to investigate the effectiveness of Taekwondo training on body composition, brain-derived neurotrophic factor (BDNF) and cognitive performance in adolescent girls.

Design

A semi-experimental design with an experimental group and a control group, with parallel, double-blind, randomized groups will be implemented on 30 inactive adolescent girls. A lottery is used for randomization.

Settings and conduct

This semi-experimental applied research includes a pre-test and a post-test with an intervention group and a control group. It will investigate the effect of taekwondo exercises on body composition, brain-derived neurotrophic factor and cognitive performance of inactive adolescent girls aged 12 to 17 years in Soumesara. The training will be held in the gym and blood tests will be done in a specialized laboratory. Collaborating researchers, including the data collector and data evaluator and analyst, will be unaware of the allocation of people in two groups and the type of intervention.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Age between 12-17 years Having physical health Having enough sleep and eating three meals a day Not participating in regular sports programs in the last 6 months Not taking any drugs or supplements Not having a history of musculoskeletal, neurological or psychological disease

Intervention groups

Intervention group: Taekwondo practice for the experimental group includes 8 weeks, 3 sessions per week, and each session will last 60 min with a pain perception pressure 11 to 15. This program includes 5 min of warm-up, 10 min of basic movements and 40 min of basic taekwondo exercises, and 5 min cooling down. Control group will continue their normal life and will not receive any intervention.

Main outcome variables

Brain-derived neurotrophic factor (BDNF), cognitive function and body mass index

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20180503039517N13**

Registration date: **2024-09-09, 1403/06/19**

Registration timing: **prospective**

Last update: **2024-09-09, 1403/06/19**

Update count: **0**

Registration date

2024-09-09, 1403/06/19

Registrant information

Name

Soleyman Ansari Kolachahi

Name of organization / entity

Country

Iran (Islamic Republic of)

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2024-09-22, 1403/07/01

Expected recruitment end date

2024-10-01, 1403/07/10

Actual recruitment start date

empty

Actual recruitment end date

empty
Trial completion date
empty

Scientific title
The effect of taekwondo training on body composition, brain-derived neurotrophic factor and cognitive function of adolescent girls

Public title
The effect of taekwondo training on brain-derived neurotrophic factor and cognitive function of adolescent girls

Purpose
Treatment

Inclusion/Exclusion criteria
Inclusion criteria:
Age between 12-17 years Having physical health Having enough sleep and eating three meals a day
Exclusion criteria:
Participating in regular sports programs in the last 6 months Taking any drugs or supplements Having a history of musculoskeletal, neurological or psychological disease

Age
From **12 years** old to **17 years** old

Gender
Female

Phase
3

Groups that have been masked

- Outcome assessor
- Data analyser

Sample size
Target sample size: **30**

Randomization (investigator's opinion)
Randomized

Randomization description
30 inactive adolescent girls will be selected by the available sampling method and will be divided into two experimental and control groups through lottery (names of the participants are written on paper and through random drawing).

Blinding (investigator's opinion)
Double blinded

Blinding description
In this research, the persons responsible for evaluating and collecting information, as well as the data analyst, are unaware of the type of intervention and the participants in the research groups.

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- Rasht Branch

Street address

Islamic Azad University of Rasht Branch, Lakan Boulevard,

City

Rasht

Province

Guilan

Postal code

4147654919

Approval date

2023-08-08, 1402/05/17

Ethics committee reference number

IR.IAU.RASHT.REC.1402.039

Health conditions studied

1

Description of health condition studied

Inactive teenage girls

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description

Brain-derived neurotrophic factor

Timepoint

48 hours before the intervention and 48 hours after 8 weeks of intervention

Method of measurement

The blood sample is taken in two stages, 48 hours before and after 8 weeks of intervention, after 12 hours of overnight fasting in the amount of 3 cc of blood in a sitting position from the brachial vein. Brain-derived neurotrophic factor (BDNF) will be evaluated using the Zell Bio kit made in Germany by ELISA method.

Secondary outcomes

1

Description

Cognitive function

Timepoint

48 hours before the intervention and 48 hours after 8 weeks of intervention

Method of measurement

The Stroop test will be used. Stroop color and word test includes three conditions: word reading, color reading and color-word reading. Each status contains 100 items

per page with 5 columns and 20 rows. Participants are asked to read the words aloud within 45 seconds. In this study, participants' raw vocabulary scores were read aloud correctly for each available condition. The allocated time range will be recorded. The higher the recorded score, the better the cognitive performance.

2

Description

Body mass index (BMI)

Timepoint

For each participant, the body mass index (BMI) will be calculated from the ratio of weight in kilograms to the second power of height in meters.

Method of measurement

48 hours before the intervention and 48 hours after 8 weeks of intervention

Intervention groups

1

Description

Intervention group: Taekwondo exercises. The training program for the experimental group will include 8 weeks of Taekwondo training, 3 sessions per week, and each session will last 60 minutes with a pain perception pressure of 11 to 15. This program includes 5 minutes of warm-up, 10 minutes of basic movements and 40 minutes of basic taekwondo exercises, and 5 minutes of cooling down.

Category

Treatment - Other

2

Description

Control group: This group will continue their normal life and will not receive any kind of intervention.

Category

N/A

Recruitment centers

1

Recruitment center

Name of recruitment center

Secondary schools of Soumesara city

Full name of responsible person

Somayyeh Mehdipour

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

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Full name of responsible person

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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

Islamic Azad University Rasht branch

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

Islamic Azad University

Full name of responsible person

Alireza Elmieh

Position

faculty member

Latest degree

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Other areas of specialty/work

Physiology

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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

No - There is not a plan to make this available

Statistical Analysis Plan

No - There is not 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

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