Clinical Trial Protocol
Iranian Registry of Clinical Trials

25 Jul 2026

The Effect of Four Weeks of Neuromuscular Exercise and Transcranial Direct Current Stimulation (tDCS) on Balance and Lower Limb Muscles Electromyography of Martial Arts Athletes with Dynamic Knee Valgus at the Moment of Landing

Protocol summary

Study aim

The Effect of Four Weeks of Neuromuscular Exercise and Transcranial Direct Current Stimulation (tDCS) on Balance and Lower Limb Muscles Electromyography of Martial Arts Athletes with Dynamic Knee Valgus at the Moment of Landing.

Design

This study is a one-way blind randomized trial with parallel groups and pre-test post-test design. Participants: 34 healthy women aged 15 to 35 years have dynamic knee valgus at landing.

Settings and conduct

After completing the written consent forms, explanations will be given about the testing procedures. In the first stage, after 10 minutes of warming up, first the electrical activity test of the lower limbs. In the second step, balance test with a foot pressure scanner. Then, after performing the pre-tests, the subjects take the envelope related to the random allocation of the subjects, which is done in advance by the supervisor and is given to the researcher. It will be held in the laboratory of Razi University of Kermanshah, Faculty of Sports Sciences.

Participants/Inclusion and exclusion criteria

Inclusion criteria: female athletes, being healthy at the time of study, at least three years of continuous attendance at martial arts (Taekwondo, Karate, Wushu, etc.) and a history of knee or ankle injuries in a Not reported in recent years. Athletes with more than 12 degrees of knee valgus are considered to have dynamic knee valgus. Exclusion criteria:Athletes with acute injuries in the past six months who have been barred from physical activity.

Intervention groups

Transcranial direct current stimulation exercises, neuromuscular exercises. There are neuromuscular exercises in both the main and control groups, the main group has transcombinal direct current stimulation

Main outcome variables

nee dynamic valgus, electrical activity of lower limb muscles in landing and lateral jumping skills, Assessment balance test with plantar pressure scanner

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20220614055164N1**
Registration date: **2022-10-09, 1401/07/17**
Registration timing: **retrospective**

Last update: **2022-10-09, 1401/07/17**
Update count: **0**

Registration date

2022-10-09, 1401/07/17

Registrant information

Name

Mozhdeh Sadat Moshashaei Hajeabadei

Name of organization / entity

The University of Kermanshah Razi

Country

Iran (Islamic Republic of)

Phone

+98 83 3429 2216

Email address

m.moshashaei@stu.razi.ac.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2022-08-06, 1401/05/15

Expected recruitment end date

2022-10-07, 1401/07/15

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The Effect of Four Weeks of Neuromuscular Exercise and Transcranial Direct Current Stimulation (tDCS) on Balance and Lower Limb Muscles Electromyography of Martial Arts Athletes with Dynamic Knee Valgus at the Moment of Landing

Public title

The Effect of Four Weeks of Neuromuscular Exercise and Transcranial Direct Current Stimulation on Balance and Lower Limb Muscles Electromyography of Martial Arts Athletes with Dynamic Knee Valgus at the Moment of Landing.

Purpose

Prevention

Inclusion/Exclusion criteria

Inclusion criteria:

Being healthy female athletes At the time of study, at least three years of continuous and regular participation in martial arts training (Taekwondo, Karate, Wushu, etc.) A history of knee or ankle injuries in the last year has not been reported. Athletes with more than 12 degrees of knee valgus are considered to have dynamic knee valgus.

Exclusion criteria:

Athletes with an acute injury in the last six months that prevented them from doing physical activity. History of fracture or surgery in the lower limb. Having strengthening interventions in addition to martial arts sports activities

Age

From **15 years** old to **35 years** old

Gender

Female

Phase

N/A

Groups that have been masked

- Participant

Sample size

Target sample size: **34**

Randomization (investigator's opinion)

Randomized

Randomization description

This study is a one-way blind randomized trial with parallel groups and a pretest-posttest design, which uses a randomized list from random.org to investigate the feasibility of direct extracorporeal flow stimulation and neuromuscular training. In people with dynamic Volgus, it deals with the knee.

Blinding (investigator's opinion)

Single blinded

Blinding description

This study is a one-way blind randomized trial in which participants are considered a blind group, selected using a random list from random.org.

Placebo

Used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics Committee of Kermanshah University of Razi

Street address

Razi University, University Street, Bostan Arch

City

kermanshah

Province

Kermanshah

Postal code

6714414971

Approval date

2022-04-16, 1401/01/27

Ethics committee reference number

IR.RAZI.REC.1401.003

Health conditions studied

1

Description of health condition studied

Dynamic knee valgus

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description

Dynamic knee valgus

Timepoint

Before pre-test and post-test

Method of measurement

To do this, participants with inclusion criteria will be tested for the jump-landing test, and while doing so, a Canon camcorder will be used - in the front view and at a distance of two meters from the subject. Approximate time of this test is 10 to 15 It's a minute. The prepared video is given to kinoveia software and the knee valgus angle will be extracted at the moment of landing.

Secondary outcomes

1

Description
Lower Limb Muscles Electromyography
Timepoint
After 10 minutes of warm-up, the lower limb electrical activity test is approximately 60 minutes long.
Method of measurement
After heating, test the electrical activity of the lower limb with an EMG device that after skin preparation (skin shaving, use of 70% alcohol and sandpaper) at the installation site of electrodes for the muscles of gluteus medius, vestus medialis and vestus lateralis, toxic membrane Biceps, electrical activity of the mentioned muscles and valgus angle of the knee are measured in two landing skills from a 30 cm box and lateral jump.

2

Description
Sole pressure scanner
Timepoint
Balance test with foot pressure scanner The approximate time of this test is 10 to 15 minutes.
Method of measurement
Balance test with foot sole pressure scanner, which is initially taken using a digital scale (SKA, made in Germany) to weigh the subject's weight and height. Subjects with the guidance of the researcher with bare feet on two legs and one foot with eyes open and closed on the marked area on the screen of the foot pressure device and the hand will be hanging next to the body.

Intervention groups

1

Description
"Intervention group:" The interventions performed in this group include: TDCS transcranial direct current stimulation, after coming to the laboratory, the subject will be asked to sit on a comfortable chair that has already been placed in the desired location. Then, the direction of installation of the electrodes will be marked using a special EEG cap, and then the electrodes will be installed in the marked areas. To stimulate the right M1 area, the anode electrode will be placed in the FC2 area and the cathode electrode will be placed on the left shoulder. After the electrodes are installed, the subjects will be seated and without any verbal communication for 20 minutes for anodal electrical stimulation with an intensity of 2 They will receive milliamps. After that, neuromuscular exercises such as resistance training, plyometrics, dynamic stability, central body strength are used. The subjects are required to complete 1-hour training sessions, three times a week for 4 weeks. This program includes a 10-minute dynamic warm-up that includes multi-planar movement, mobility, coordination, balance, plyometrics, and jogging with the goal of increasing body temperature. After the dynamic warm-up, the subjects perform initial exercises focusing on muscle strength, lower body strength, upper body strength, and core strength. As the subjects get used to the exercises, the volume is gradually increased. Exercises include the use of body mass, barbells, dumbbells, resistance bands and weight plates. Subjects will perform the exercises between 3 to 4 sets of 10 to 15.
Category
Prevention

2

Description
"Control group:" The interventions of this group include: TDCS transcranial direct current stimulation exercises. In this group, the method of recording the electrodes will be similar to the anodal electrical stimulation mode (intervention group), with the difference that sham stimulation will be used. In this stimulation, the electric current will be gradually increased for 30 seconds to create a state similar to anode stimulation, and then it will return to the initial state and practically no stimulation will be received in the target areas. After that, neuromuscular exercises such as resistance training, plyometrics, dynamic stability, central body strength are used. The subjects are required to complete 1-hour training sessions, three times a week for 4 weeks. This program includes a 10-minute dynamic warm-up that includes multi-planar movement, mobility, coordination, balance, plyometrics, and jogging with the goal of increasing body temperature. After the dynamic warm-up, the subjects perform initial exercises focusing on muscle strength, lower body strength, upper body strength, and core strength. As the subjects get used to the exercises, the volume is gradually increased. Exercises include the use of body mass, barbells, dumbbells, resistance bands and weight plates. Subjects will perform the exercises between 3 to 4 sets of 10 to 15.
Category
Placebo

Recruitment centers

1

Recruitment center
Name of recruitment center
Hajj Zavareh Academy
Full name of responsible person
Mozhdeh Sadat Moshashaei Hajeabadei
Street address
Haji Zavareh Academy, behind Pasargad Pool, Asranqalab Street
City
Kermanshah
Province
Kermanshah
Postal code
6715778314
Phone

+98 83 3423 2580

Email

m.moshashaei@stu.razi.ac.ir

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Razi University of Kermanshah

Full name of responsible person

Farzanh Gandomi

Street address

Razi University, University Street, Bostan Arch

City

Kermanshah

Province

Kermanshah

Postal code

6714414971

Phone

+98 83 3427 7605

Email

gandomi777@gmail.com

Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?

Yes

Title of funding source

Razi University of Kermanshah

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

Academic

Person responsible for general inquiries

Contact

Name of organization / entity

Razi University of Kermanshah

Full name of responsible person

Mozhdeh Sadat Moshashaei Hajeabadei

Position

MSc student

Latest degree

Master

Other areas of specialty/work

Others

Street address

Razi University, University Street,Bostan Arch

City

Kermanshah

Province

Kermanshah

Postal code

6714414971

Phone

+98 83 3427 7605

Email

m.moshashaei@stu.razi.ac.ir

Person responsible for scientific inquiries

Contact

Name of organization / entity

Razi University of Kermanshah

Full name of responsible person

Farzanh Gandomi

Position

Assistant Professor

Latest degree

Ph.D.

Other areas of specialty/work

Sport Medicine

Street address

Razi University, University Street, Bostan Arch

City

Kermanshah

Province

Kermanshah

Postal code

6714414971

Phone

+98 83 3427 7605

Email

gandomif@razi.ac.ir

Person responsible for updating data

Contact

Name of organization / entity

Razi University of Kermanshah

Full name of responsible person

Mozhdeh Sadat Moshashaei Hajeabadei

Position

Senior students

Latest degree

Master

Other areas of specialty/work

Pathologist and corrective exercises

Street address

Razi University, University Street, Bostan Arch

City

Kermanshah

Province

Kermanshah

Postal code

6714414971

Phone

+98 83 3427 7605

Email

m.moshashaei@stu.razi.ac.ir

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
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