# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

22 Nov 2026

## The Effect of Traditional and Embodied Cognition Training Methods on Aerobics Exercise Learning and Improvement of Fitness Factors in Female Students

## Protocol summary

**Study aim**
The aim of this study is to compare the effectiveness of two methods, traditional training and embodied cognition training, on the learning of aerobic movements and the improvement of physical fitness factors in female university students.

**Design**
This trial will be conducted with two intervention groups (traditional training and embodied cognition training) involving 60 students.

**Settings and conduct**
This research will be conducted at the faculty of physical education, Kharazmi University. for this purpose, 60 students aged 18-24 will be allocated to two intervention groups (traditional training and embodied cognition training). a pre-test will be conducted, followed by 16 weeks of training, and then post-test will be performed.

**Participants/Inclusion and exclusion criteria**
Inclusion Criteria: Healthy students aged 18 to 24 years will be allocated to intervention groups 1 and 2.
Exclusion Criteria: Students engaged in professional athletic activity will not participate in the study.

**Intervention groups**
Intervention groups 1 and 2 (traditional training and embodied cognition training) will receives 16 weeks of physical fitness exercises and rhythmic movements.

**Main outcome variables**
Physical fitness factors, lower limb kinematics during the execution of an aerobic chain.

## General information

**Reason for update**

**Acronym**

**IRCT registration information**
IRCT registration number: **IRCT20130109012078N9**
Registration date: **2025-05-31, 1404/03/10**
Registration timing: **prospective**

Last update: **2025-05-31, 1404/03/10**
Update count: **0**

**Registration date**
2025-05-31, 1404/03/10

**Registrant information**

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Azad

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**Recruitment status**
**Recruitment complete**

**Funding source**

**Expected recruitment start date**
2025-09-22, 1404/06/31

**Expected recruitment end date**
2025-12-20, 1404/09/29

**Actual recruitment start date**
empty

**Actual recruitment end date**
empty

**Trial completion date**
empty

**Scientific title**
The Effect of Traditional and Embodied Cognition Training Methods on Aerobics Exercise Learning and Improvement of Fitness Factors in Female Students

**Public title**

The Effect Two Training Methods on Aerobics Exercise Learning

**Purpose**

Other

**Inclusion/Exclusion criteria**

**Inclusion criteria:**

Healthy musculoskeletal and nervous systems. Completely healthy cardiovascular and respiratory systems, with no underlying diseases that could affect performance. No history of specific trauma or pain in either foot, lower extremities, or lumbar region within the 12 months prior to the study. This study will be conducted on healthy students aged 18 to 24 years.

**Exclusion criteria:**

Professional athletes or individuals engaged in regular athletic activity. Students with obvious lower limb and foot deformities, such as genu varum or genu valgum, coxa vara or coxa valga (structural). Individuals with a history of neurological, rheumatic, metabolic diseases, psychiatric disorders, vestibular system disorders, or recurrent positional vertigo/falls.

**Age**

From **18 years** old to **24 years** old

**Gender**

Female

**Phase**

N/A

**Groups that have been masked**

*No information*

**Sample size**

Target sample size: **60**

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

To randomly assign participants from four Physical Fitness 2 course codes to the two intervention groups (traditional training and embodied cognition training), a lottery method will be employed. Specifically, the codes for the four course groups will be written on separate slips of paper, and each slip will be placed inside a distinct sphere (ball). The spheres will then be thoroughly mixed, and two spheres will be drawn sequentially from the container. The first drawn sphere will be assigned to the traditional training group, and the second to the embodied cognition training group. This process will be repeated for the remaining two spheres, ensuring that each training method is ultimately assigned to two course groups.

**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**

Kharazmi University

**Street address**

Faculty of Physical Education & Sports Sciences of Kharazmi University, Mirdamad Ave, Tehran, Iran.

**City**

Tehran

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157191491

**Approval date**

2025-04-19, 1404/01/30

**Ethics committee reference number**

IR.KHU.REC.1404.006

## Health conditions studied

### 1

**Description of health condition studied**

Muscle strength

**ICD-10 code**

Y93.B9

**ICD-10 code description**

Activity, other involving muscle strengthening exercises

### 2

**Description of health condition studied**

Muscle endurance

**ICD-10 code**

**ICD-10 code description**

### 3

**Description of health condition studied**

Balance

**ICD-10 code**

Q95.8

**ICD-10 code description**

Other balanced rearrangements and structural markers

### 4

**Description of health condition studied**

Agility

**ICD-10 code**

**ICD-10 code description**

### 5

**Description of health condition studied**

Movement pattern

**ICD-10 code**

**ICD-10 code description**

## Primary outcomes

### 1

**Description**
Kinematic assessment (joint angles) during the execution of an aerobic chain.
**Timepoint**
Before and after the intervention.
**Method of measurement**
Using a GoPro 7 camera, the movement chain will be recorded before and after the intervention. Joint angles of the lower limbs will be calculated during the movement chain using Kinovea software.

### 2

**Description**
Measurement of abdominal and spinal extensor muscle endurance.
**Timepoint**
Before and after the intervention.
**Method of measurement**
To measure the endurance of the abdominal and spinal extensor muscles, the partial curl-up test and plank hold will be used.

### 3

**Description**
Measurement of upper limb strength.
**Timepoint**
Before and after the intervention.
**Method of measurement**
To measure shoulder girdle strength, the push-up test will be used.

### 4

**Description**
Measurement of agility and coordination.
**Timepoint**
Before and after the intervention.
**Method of measurement**
To measure agility, the T-test and Illinois Agility Test will be used.

## Secondary outcomes

empty

## Intervention groups

### 1

**Description**
Intervention group: Participants in the traditional group will receive one session of exercises related to physical fitness factors and one session of rhythmic movements. They will learn and practice these rhythmic movements as part of an aerobic chain. During exercise execution, they will receive necessary feedback from the instructor for movement pattern correction if needed.
**Category**
N/A

### 2

**Description**
Intervention group: Participants in the embodied cognition training group, similar to the traditional group, will receive one session of exercises related to physical fitness factors and one session of rhythmic movements. During the execution of physical fitness exercises, participants will be required to discover how to perform the exercises themselves. The instructor will guide students towards the correct solution during this discovery process. At the end of each session, the instructor will review with the students which physical fitness factors were addressed and which muscles and joints were primarily engaged. Similarly, during the execution of rhythmic movements within the aerobic chain, students will be asked to find solutions for improving movement fluency, and the instructor will assist them in this exploration.
**Category**
N/A

## Recruitment centers

### 1

**Recruitment center**
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## Sponsors / Funding sources

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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**
kharazmi University
**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

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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**

Not applicable

**Data Dictionary**

Not applicable

**Title and more details about the data/document**

Data related to physical fitness factors and kinematic assessment before and after the intervention will be made available to researchers.

**When the data will become available and for how long**

January/February 2026.

**To whom data/document is available**

Students and university professors.

**Under which criteria data/document could be used**

This trial will be published in the form of an academic project.

**From where data/document is obtainable**

One should refer to the library of Kharazmi University.

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

Students will go to the library and receive the file from the librarian.

**Comments**