

Clinical Trial Protocol

Iranian Registry of Clinical Trials

14 Jul 2026

The effect of Pilates exercises on proprioception and balance in students with and without flexible flat foot

Protocol summary

Study aim

The purpose of this study is to investigate the effect of Pilates exercises on balance and proprioception sense in female students with and without flexible flatfoot.

Design

This trial will be conducted on 100 students with two intervention groups (flexible flatfoot and normal foot).

Settings and conduct

This research will be conducted in the Faculty of Physical Education of Kharazmi University. For this purpose, 100 available students aged 18-24 years old will be placed in two intervention groups (group with and without flexible flatfoot). The pre-test will be performed. Then, training will be performed for 16 weeks. Then the post-test will be done.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Students with and without flexible flatfoot between 18 and 24 years of age will be included in intervention groups 1 and 2. Exclusion criteria: Students with regular sports activities will not participate in the study.

Intervention groups

Intervention group 1 and 2 (students with and without flexible flatfoot) will receive Pilates exercises for 16 weeks.

Main outcome variables

Static balance, knee and ankle joint position sense.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20130109012078N6**

Registration date: **2022-11-18, 1401/08/27**

Registration timing: **prospective**

Last update: **2022-11-18, 1401/08/27**

Update count: **0**

Registration date

2022-11-18, 1401/08/27

Registrant information

Name

Maryam Ghorbani

Name of organization / entity

Azad

Country

Iran (Islamic Republic of)

Phone

+98 21 6656 2382

Email address

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2023-01-20, 1401/10/30

Expected recruitment end date

2023-06-19, 1402/03/29

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The effect of Pilates exercises on proprioception and balance in students with and without flexible flat foot

Public title

Investigating the effect of Pilates exercises on proprioception

Purpose

Supportive

Inclusion/Exclusion criteria

Inclusion criteria:

Female students in the age range of 18-24 years The health of the nervous, skeletal and muscular system (except for the deformity of flexible flatfoot) The health of the cardiovascular system, respiratory system, etc.

Exclusion criteria:

Suffering from structural flatfoot Having regular sports activities People who have a history of neurological, rheumatism, metabolic diseases, mental disorders, disorders in the vestibular system, a history of balance disorders and frequent dizziness

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: **100**

Randomization (investigator's opinion)

Not randomized

Randomization description

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

Ethics Committee in Research of Sports Science
Research Institute

Street address

No. Mir Emad St. 5th Alley . Ostad Motahhari St.
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1587958711

Approval date

2022-10-22, 1401/07/30

Ethics committee reference number

IR.SSRC.REC.1401.071

Health conditions studied

1

Description of health condition studied

flatfoot

ICD-10 code

M21.4

ICD-10 code description

Flat foot [pes planus] (acquired)

Primary outcomes

1

Description

static balance

Timepoint

Measurements will be performed before and after the training intervention

Method of measurement

Sharpened-Romberg test will be used to evaluate static balance. For this purpose, the subject will stand without shoes on a flat surface and places the dominant foot in tandem position in front of the non-dominant foot; hands will be crossed on the chest. This test will be performed with closed eyes. The time that a person will be able to maintain the posture before the balance is disturbed will be considered as a person's score.

2

Description

knee and ankle joint position sense

Timepoint

Measurements will be performed before and after the training intervention

Method of measurement

In order to measure the position sense of the ankle and knee joints, the ankle and knee angle active reconstruction test will be used. A goniometer will be used during reconstruction of desired angles.

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group 1 (with flexible flatfoot): Pilates exercises. In the exercise program based on Pilates, each session of the exercises suitable for the prerequisites and levels 4 and 3 of Pilates, which is for beginners, will be performed for 80 minutes. -Training period: sixteen weeks. -Number of training sessions per week: one session per week. -The duration of each training session: 90 minutes (5 minutes of warm-up, 80 minutes of the main body of the class, 5 minutes of cool-down) in each session.

Category

Rehabilitation

2

Description

Intervention group 2 (with normal foot): Pilates exercises. In the exercise program based on Pilates, each session of the exercises suitable for the prerequisites and levels 4 and 3 of Pilates, which is for beginners, will be performed for 80 minutes. -Training period: sixteen weeks. -Number of training sessions per week: one session per week. -The duration of each training session: 90 minutes (5 minutes of warm-up, 80 minutes of the main body of the class, 5 minutes of cool-down) in each session.

Category

Prevention

Recruitment centers

1

Recruitment center

Name of recruitment center

Shahid Bahonar Higher Education Center of Tehran

Full name of responsible person

Maryam Ghorbani

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Shahid Bahonar Higher Education Center of Tehran.
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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

kharazmi University

Full name of responsible person

Dr. Hamid Rajabi

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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

Contact

Name of organization / entity

kharazmi University

Full name of responsible person

Maryam Ghorbani

Position

student

Latest degree

Master

Other areas of specialty/work

motor behavior

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Person responsible for scientific inquiries

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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

Not applicable

Data Dictionary

Not applicable

Title and more details about the data/document

Data related to static balance and sense of knee and ankle joint position before and after the intervention will be provided to the audience.

When the data will become available and for how long

September 2023.

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