Clinical Trial Protocol
Iranian Registry of Clinical Trials

10 Jun 2026

Comparison of the effect of NASM exercises with and without Kinesio taping on some musculoskeletal variables in 12 to 15-year-old female students with functional flat feet.

Protocol summary

Study aim

Comparison of the effect of NASM exercises with and without Kinesio taping on some musculoskeletal variables in people with functional flat feet.

Design

The clinical trial will be a triple-blind, pre-test and post-test study. Participants will be randomly assigned to 2 groups, with the groups performing NASM exercises with and without Kinesio taping.

Settings and conduct

Samples of 32 people are selected based on availability and randomly divided into two groups: an experimental group of 16 people and a control group of 16 people. The randomization process is carried out by a researcher who has no direct connection with the researchers and is not involved in the intervention phase. The tests are conducted in the laboratory of Islamic Azad University, Karaj branch.

Participants/Inclusion and exclusion criteria

Participants should have functional flat feet, be aged between 13 and 16 years, and should not have undergone surgery or suffered an injury to the lower limbs in the past six months.

Intervention groups

Subjects will be randomly divided into 2 groups. The control group will perform NASM exercises 3 times per week for 8 weeks in 30-minute sessions. The experimental group will perform NASM exercises along with Kinesio taping 3 times per week for 8 weeks in 30-minute sessions.

Main outcome variables

Navicular drop test Star Excursion Balance Test Static and dynamic balance Ankle proprioception Foot and Ankle Ability Measure questionnaire

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20240907062968N7**
Registration date: **2026-05-05, 1405/02/15**
Registration timing: **registered_while_recruiting**

Last update: **2026-05-05, 1405/02/15**
Update count: **0**

Registration date

2026-05-05, 1405/02/15

Registrant information

Name

Ali Honarvar

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 26 3443 4073

Email address

alihonarvar144@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-05-05, 1405/02/15

Expected recruitment end date

2026-05-20, 1405/02/30

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title
Comparison of the effect of NASM exercises with and without Kinesio taping on some musculoskeletal variables in 12 to 15-year-old female students with functional flat feet.

Public title
The effect of NASM exercises with and without Kinesio taping on some musculoskeletal variables.

Purpose
Prevention

Inclusion/Exclusion criteria

Inclusion criteria:
Flatfoot functional impairment Written consent of the volunteer and parents Not using any medication that affects the nervous system and controlling posture. girls aged between 12 - 15

Exclusion criteria:
History of types of accidents, collisions, and ankle sprains Having an allergy to adhesive and experiencing coldness and sweating of the soles. Absence of two consecutive sessions or more than three sessions in total during the entire course

Age
From **12 years** old to **15 years** old

Gender
Female

Phase
N/A

Groups that have been masked

- Care provider
- Investigator
- Outcome assessor
- Data analyser
- Data and Safety Monitoring Board

Sample size
Target sample size: **32**

Randomization (investigator's opinion)
Randomized

Randomization description
The randomization method will be web-based. Subjects who meet the inclusion criteria will be randomly assigned to the first experimental group and the control group using the randomization method of the website (Social Psychology Network, Connecticut, USA) www.randomizer.org. The randomization will be simple. Concealment of random allocation will be done using a computer-generated blocked random table, where number 1 is defined for the NASM exercise group, and number 2 for the NASM exercise with Kinesio taping group. Then, the random numerical sequence will be placed in opaque, sealed envelopes. Also, according to the assignment of groups, the intervention will be continued by the researcher.

Blinding (investigator's opinion)
Double blinded

Blinding description
Participants, after studying the consent form in a 30-minute session, are informed about the study groups and participate willingly without having the option to choose their group. Patient names are randomly divided into three equal groups by a person unaware of the individuals' identity and physical characteristics, using the website http://randomizer.org, and each part is placed separately in sealed envelopes. Then, each individual receives the appropriate training and exercises according to their assigned group. The analyzer and outcome evaluator, without knowledge of the hypotheses, study methods, and patient characteristics, examines and compares the changes made before and after eight weeks. Also, for blinding the subjects, kinesio tape was applied in both groups, with therapeutic pressure applied in the experimental group and no pressure applied in the control group, only to eliminate the placebo effect of the kinesio tape.

Placebo
Not used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Ethics Committee of Islamic Azad University Karaj branch

Street address
Karaj Branch, Islamic Azad University, Mo'azen Boulevard, Rajai Shahr, Karaj City Alborz Province

City
Karaj

Province
Alborz

Postal code
3149968111

Approval date
2025-10-28, 1404/08/06

Ethics committee reference number
IR.IAU.K.REC.1404.143

Health conditions studied

1

Description of health condition studied
flat foot

ICD-10 code
M21.4

ICD-10 code description
Flat foot [pes planus] (acquired)

Primary outcomes

1

Description

Navicular drop index

Timepoint

Before and after the intervention

Method of measurement

The navicular drop test (Brody method) was used to assess foot structure. The height of the navicular bone from the ground was first measured in a seated position with standardized joint alignment, and then re-measured in a standing position with equal weight distribution. The difference between these two measurements was recorded as the navicular drop. Measurements were performed three times for each foot. A drop of 5–9 mm was considered normal, while values greater than 10 mm indicated flat foot.

2

Description

Y balance test

Timepoint

Before and after the intervention

Method of measurement

The Y-Balance Test was conducted in three directions: anterior, posteromedial, and posterolateral. Participants stood on one leg at the center of the Y and reached with the opposite leg as far as possible in each direction while maintaining balance. The reach distance from the center to the point of contact was recorded in centimeters. To minimize learning effects, participants performed six practice trials in each direction with 15 seconds of rest between trials, followed by a 5-minute rest before the main test. Trials were repeated if errors occurred (e.g., movement of the stance foot or loss of balance). For data normalization, lower limb length was measured from the anterior superior iliac spine to the medial malleolus in a supine position. The final balance score was calculated as the average reach distance across the three directions relative to limb length.

3

Description

Proprioception of the ankle

Timepoint

Before and after the intervention

Method of measurement

To assess ankle joint proprioception in a closed kinetic chain, participants stood on their dominant leg while keeping the opposite leg suspended without ground contact. A 5-cm wedge was placed under the heel to minimize the passive contribution of the gastrocnemius muscle. The target ankle position was set at 15° dorsiflexion using a goniometer, with participants shifting their weight onto the test leg and maintaining this position for 5 seconds; this was repeated three times for familiarization. Participants were then asked to actively reproduce the 15° dorsiflexion angle from a neutral starting position (0°) in three trials. Each reproduced position was held for 3 seconds and recorded באמצעות imaging. The images were analyzed using Kinovea software, and the mean absolute error between the target and reproduced angles was calculated as the joint position sense error.

4

Description

Staheli Arch Index

Timepoint

Before and after the intervention

Method of measurement

The plantar arch was assessed using the Staheli Arch Index. Footprints were obtained by applying talcum powder to the participants' feet and asking them to walk across a cardboard surface without focusing on it. The Staheli Index was calculated as the ratio of the minimum width of the midfoot region to the maximum width of the heel region (A/B). Values <0.44 indicated a high arch (pes cavus), values between 0.44 and 0.89 were considered normal, and values >0.89 indicated a low arch (flat foot).

5

Description

Static balance

Timepoint

Before and after the intervention

Method of measurement

In this test, the participant stood on the dominant leg with hands placed on the hips and positioned the toes of the non-dominant foot on the knee of the stance leg. Upon the command "ready," the participant lifted the heel of the stance foot and balanced on the toes while maintaining stability without moving the foot or removing the hands from the hips. The test was performed three times, and the best time was recorded as the final score.

6

Description

Proprioception of the knee joint

Timepoint

Before and after the intervention

Method of measurement

Knee joint proprioception was assessed using an angle reproduction test with a goniometer. A target angle of 45° knee flexion was selected. Participants were seated with the knee initially at 90°, and the examiner passively moved the limb to the target angle, holding it for 5 seconds to allow memorization. The limb was then returned to the starting position, and after a 5-second pause, participants were asked to actively reproduce the target angle with their eyes closed. The reproduced angle was recorded. The procedure was repeated three times with 10-second rest intervals, and the absolute error between the target and reproduced angles was calculated as the outcome measure.

7

Description

Before and after the intervention

Timepoint

Before and after intervention

Method of measurement

The Foot and Ankle Ability Measure (FAAM) was originally developed in the United States by Hill and Hertel (2005) for adults. It consists of 26 items divided into two subscales: pain and function (disability). Scoring is based on a 5-point Likert scale ranging from 0 (unable to perform) to 4 (no difficulty). Subscale scores are calculated by summing the relevant items and are scaled from 0 to 100. The total score is obtained by summing the scores of all subscales.

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group: Intervention group: Subjects performed NASM exercises for eight weeks (three 30-minute sessions per week), during which time Kinesio taping was also applied to the subjects' ankles.
Category
Prevention

2

Description
Control group: Control group: NASM exercise subjects performed these exercises for eight weeks (three 30-minute sessions each week).
Category
Prevention

Recruitment centers

1

Recruitment center
Name of recruitment center
Islamic Azad university Karaj Branch
Full name of responsible person
Vahid Mazloum
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Moazeen Boulevard, Islamic Azad University, Karaj Branch
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Phone
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Vahid.mazloum@yahoo.com

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
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Full name of responsible person
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Phone
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Email
info@kiau.ac.ir
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
No
Title of funding source
Islamic Azad University
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
Persons

Person responsible for general inquiries

Contact
Name of organization / entity
Islamic Azad University
Full name of responsible person
Vahid Mazloum
Position
Assistant Professor
Latest degree
Ph.D.
Other areas of specialty/work
Physiotherapy
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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
No - There is not a plan to make this available
Clinical Study Report
Not applicable
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
Title and more details about the data/document
The data related to the subjects of the control and intervention groups in the pre-test and post-test are shared in an unidentifiable way.
When the data will become available and for how long
Six months after the publication of articles
To whom data/document is available
All researchers
Under which criteria data/document could be used
There is no obstacle to using data for citation, by mentioning the source.
From where data/document is obtainable
Vahid.mazloum@yahoo.com
What processes are involved for a request to access data/document
The request will be made by email and the answer will be sent within 15 days.
Comments