

Clinical Trial Protocol

Iranian Registry of Clinical Trials

15 Jun 2026

The effect of NASM exercises on ground reaction forces, muscle electrical activity, and plantar pressures in people with piriformis syndrome, back pain, and foot peroneitis

Protocol summary

Study aim

The purpose of this study was the effect of NASM exercises on ground reaction forces, muscle electrical activity and plantar pressures in people with piriformis syndrome, back pain and peroneitis.

Design

Using Gpower software, the minimum sample size for each group was estimated to be 14 people to obtain an effect size of 0.3 at a significance level of 0.05 and a statistical power of 0.95. 45 boys with flat feet, piriformis syndrome and back pain will be identified from students of Mohaghegh Ardabili University. People who had more than 10 mm of navicular bone prolapse in both feet were identified as people with flat feet. In order to determine the amount of sagging of the navicular bone, the height difference of the navicular bone from the ground in bare feet was calculated based on weight bearing in two positions, standing and sitting on a chair.

Settings and conduct

45 boys with flat feet, piriformis syndrome and back pain will be identified from students of Mohaghegh Ardabili University.

Participants/Inclusion and exclusion criteria

General conditions for entering the test: no history of wrist sprains in the past year, heel rotation outwards, wear on the inside of the examinee's shoes, injury or serious blows in the lower limbs, and no use of artificial limbs in the thigh, knee, and ankle, and illness were related to nerves. Exclusion criteria from the study included a history of fracture, surgery, orthopedic diseases, neuromuscular problems, and activity limitation according to the doctor's recommendation.

Intervention groups

National Academy of Sports Medicine exercises

Main outcome variables

Knowing the effect of NASM training on the biomechanics of walking and running; Knowing the effect of NASM

training on the electrical activity of lower limb muscles in walking and running

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20200912048696N2**

Registration date: **2024-03-08, 1402/12/18**

Registration timing: **registered_while_recruiting**

Last update: **2025-02-23, 1403/12/05**

Update count: **1**

Registration date

2024-03-08, 1402/12/18

Registrant information

Name

hamed sheikhalizade

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 41 4343 2602

Email address

hamed.sh2102@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2024-03-05, 1402/12/15

Expected recruitment end date

2024-05-04, 1403/02/15

Actual recruitment start date

empty

Actual recruitment end date

empty
Trial completion date
empty

Scientific title
The effect of NASM exercises on ground reaction forces, muscle electrical activity, and plantar pressures in people with piriformis syndrome, back pain, and foot peroneitis

Public title
The effect of NASM exercises on ground reaction forces, muscle electrical activity, and plantar pressures in people with piriformis syndrome, back pain, and foot peroneitis

Purpose
Prevention

Inclusion/Exclusion criteria
Inclusion criteria:
No history of wrist sprains in the past year turning the heel outwards wear on the inside of the subject's shoes injuries or serious blows in the lower limbs Not using artificial limbs in thighs, knees and ankles and diseases related to nerves
Exclusion criteria:
history of fracture surgery orthopedic diseases neuromuscular problems activity limitation according to the doctor's recommendation

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

Gender
Both

Phase
N/A

Groups that have been masked

- Care provider
- Data analyser

Sample size
Target sample size: **45**

Randomization (investigator's opinion)
Not randomized

Randomization description
Blinding (investigator's opinion)
Double blinded

Blinding description
The person in charge of the laboratory will not be told which of the subjects are the control group or the experimental group, and only the principal investigator will know the complete process of the test. Blinding will be as follows: considering that the subjects will be present in the laboratory one by one, therefore only the protocol related to him will be explained and implemented for each subject. In the meantime, the laboratory manager will not be given information about the studied groups.

Placebo
Not used

Assignment
Parallel

Other design features

Secondary Ids
empty

Ethics committees

1
Ethics committee
Name of ethics committee
Mohaghegh Ardabili University
Street address
University
City
Ardabili
Province
Ardabil
Postal code
13131-56199
Approval date
2024-01-24, 1402/11/04
Ethics committee reference number
IR.UMA.REC.1402.051

Health conditions studied

1
Description of health condition studied
Piriformis syndrome
ICD-10 code
ICD-10 code description

2
Description of health condition studied
Low back pain
ICD-10 code
M54.5
ICD-10 code description
Low back pain

3
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
ground reaction force
Timepoint
8 weeks
Method of measurement
Force plate

2

Description

Electrical activities of muscles

Timepoint

8 weeks

Method of measurement

Electromyography

3

Description

Pressure Distribution

Timepoint

8 weeks

Method of measurement

foot scan

Secondary outcomes

empty

Intervention groups

1

Description

First intervention group: American National Academy of Sports Medicine exercises. The protocol of this exercise includes 4 stages of restraint, stretching, activation and cohesion techniques. The application of inhibition techniques is to affect the automatic nervous system and reduce the effects of trigger points. In the next step, lengthening or stretching techniques are used to increase the range of motion of the tissue or joint, and activation techniques are used to strengthen weak muscles.

Category

Rehabilitation

2

Description

Control group: Healthy. There will be no intervention in this group. The healthy group will only participate in the pre-test and post-test.

Category

Other

Recruitment centers

1

Recruitment center

Name of recruitment center

Mohagheh Ardabili University Health Center

Full name of responsible person

Behrouz Heydari

Street address

University

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Ardabil

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13131-56199

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+98 914 736 1070

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hamed.sh2102@gmail.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Mohagheh Ardabili University

Full name of responsible person

Behroz heidari

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+98 915 305 8339

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Barghamadi@uma.ac.ir

Grant name

Grant code / Reference number

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

Yes

Title of funding source

Mohagheh Ardabili 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

Mohagheh Ardabili University

Full name of responsible person

Hamed Sheikhalizade

Position

Student

Latest degree

Master

Other areas of specialty/work

Physiology

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Person responsible for scientific inquiries

Contact

Name of organization / entity
Mohaghegh Ardabili University
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Position
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Person responsible for updating data

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Sharing plan

Deidentified Individual Participant Data Set (IPD)

No - There is not a plan to make this available

Justification/reason for indecision/not sharing IPD

There is no further information

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

No - There is not a plan to make this available

Clinical Study Report

No - There is not a plan to make this available

Analytic Code

No - There is not a plan to make this available

Data Dictionary

No - There is not a plan to make this available