Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 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
Mohagheg Ardabili University Health Center
Full name of responsible person
Behrouz Heydari
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Mohaghegh Ardabili University
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Email
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
Mohaghegh 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
Mohaghegh Ardabili University
Full name of responsible person
Hamed Sheikhalizade
Position
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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