

Clinical Trial Protocol

Iranian Registry of Clinical Trials

25 Jun 2026

Effect of 4 weeks of plyometric training with and without blood flow restriction on some biochemical markers of bone inactive girls

Protocol summary

Study aim

Investigating the effect of plyometric exercises with and without blood flow restriction on bone metabolism markers

Design

People are asking for participation in the registration scheme. Then, among them, the qualified individuals are selected and during a briefing, they will first familiarize with the type of plan, objectives and implementation method, including the method of performing a preliminary test (pre-test), participating in training, post-test and blood tests. In this session, the participants complete the consent form of the company in the test and form of the public health questionnaire and will assure them that the information they receive will be completely confidential. Subjects will be randomly divided into exercise and exercise groups with limited blood flow. After performing biochemical tests and initial anthropometric measurements, the groups will have plyometric and pleometric blood flow limitation for 4 weeks. Finally, the tests were retested after 4 weeks of training and the data were analyzed.

Settings and conduct

Participants will complete 3 exercises for four weeks a week and 25 minutes each session for the first week, which will last 40 minutes in the last week, at the sports halls Shahid Chamran University.

Participants/Inclusion and exclusion criteria

Missing more than one session in the exercises
Participate in sports meetings other than sports presentations

Intervention groups

The present study will be conducted on two groups of high intensity plyometric exercises and a plyometric group with blood flow limitation. One of the training groups will undergo intensive training for 4 weeks and the other will practice low intensity plyometric exercise with limited blood flow.

Main outcome variables

Exercise with low levels of blood circulation can lead to improved bone metabolism and, therefore, prevention of osteoporosis.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20181211041921N1**

Registration date: **2019-08-27, 1398/06/05**

Registration timing: **retrospective**

Last update: **2019-08-27, 1398/06/05**

Update count: **0**

Registration date

2019-08-27, 1398/06/05

Registrant information

Name

fatemeh fakhri

Name of organization / entity

Shahid Chamran University of Ahwaz

Country

Iran (Islamic Republic of)

Phone

+98 61 3333 0019

Email address

fakhri.fatemeh@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2019-04-21, 1398/02/01

Expected recruitment end date

2019-04-29, 1398/02/09

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Effect of 4 weeks of plyometric training with and without blood flow restriction on some biochemical markers of bone inactive girls

Public title

The effect of plyometric exercises with and without blood flow restriction on bone metabolism

Purpose

Prevention

Inclusion/Exclusion criteria**Inclusion criteria:**

Having a 20 to 30 year old Having physical and mental health Having a Low activity level

Exclusion criteria:

Taking medicine, alcohol, smoking, Family history of osteopenia and osteoporosis, and associated bone fractures Joint inflammation Suffering from diseases like diabetes, thyroid, hypertension, heart disease and menstrual irregularities

Age

From **20 years** old to **30 years** old

Gender

Female

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **24**

Randomization (investigator's opinion)

Randomized

Randomization description

In this research, a simple randomization method will be used.

Blinding (investigator's opinion)

Not blinded

Blinding description**Placebo**

Not used

Assignment

Factorial

Other design features**Secondary Ids**

empty

Ethics committees**1****Ethics committee****Name of ethics committee**

Ahwaz Shahid Chamran University

Street address

Golestan Ave.

City

Ahvaz

Province

Khouzestan

Postal code

7167776122

Approval date

2019-01-26, 1397/11/06

Ethics committee reference number

IR.AJUMS.REC.1397.70342

Health conditions studied**1****Description of health condition studied**

Osteoporosis

ICD-10 code

Z80-Z99

ICD-10 code description

Persons with potential health hazards related to family and personal history and certain conditions influencing health status

Primary outcomes**1****Description**

Bone alkaline phosphatase was considered as maceration of bone formation.

Timepoint

Measurement of alkaline phosphatase levels before the beginning of the 4-week training period and 48 hours after the end of the training period

Method of measurement

Laboratory and Using a special measuring kit for bone alkaline phosphatase

2**Description**

C- terminal telopeptides of type 1 collagen

Timepoint

Measurement of C- terminal telopeptides of type 1 collagen levels before the beginning of the 4-week training period and 48 hours after the end of the training period

Method of measurement

Laboratory

Secondary outcomes

empty

Intervention groups**1****Description**

Intervention group 1: The high intensity plyometric training group will perform plyometric exercises for 4

weeks (3 sessions per week). In this group blood flow restriction will not be applied

Category

Prevention

2**Description**

Intervention group 2: A specially designed elastic belt (Tokyo, Japan) is placed around the most proximal portion of both legs during the exercise. A cuff pressure of 160 mm Hg is considered during the training and the Subjects will perform their exercises on the step board at a height of 20 cm. The training period for this group will be 4 weeks (3 sessions per week).

Category

Prevention

Recruitment centers**1****Recruitment center****Name of recruitment center**

Shahid Chamran of Ahwaz University

Full name of responsible person

Fatemeh Fakhri

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Golestan Blvd, Shahid Chamran University of Ahvaz

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Sponsors / Funding sources**1****Sponsor****Name of organization / entity**

دانشگاه شهید چمران اهواز

Full name of responsible person

Dr. Abdulhamid Habibi

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Hamidhabibi330@scu.ac.ir

Grant name**Grant code / Reference number****Is the source of funding the same sponsor organization/entity?**

Yes

Title of funding source

دانشگاه شهید چمران اهواز

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**

Faculty of Sport Sciences, Shahid Chamran University of Ahvaz

Full name of responsible person

Fatemeh Fakhri Pay Borji

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**

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Person responsible for updating data**Contact****Name of organization / entity**Faculty of Sport Sciences, Shahid Chamran University
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Fatemeh Fakhri Pay Borji

Position

Student

Latest degree

Master

Other areas of specialty/work

Physiology

Street address

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City

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Province**Sharing plan****Deidentified Individual Participant Data Set (IPD)**Undecided - It is not yet known if there will be a plan to
make this available**Study Protocol**Undecided - It is not yet known if there will be a plan to
make this available**Statistical Analysis Plan**Undecided - It is not yet known if there will be a plan to
make this available**Informed Consent Form**Undecided - It is not yet known if there will be a plan to
make this available**Clinical Study Report**Undecided - It is not yet known if there will be a plan to
make this available**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