

# 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

**Street address**

Golestan Blvd, Shahid Chamran University of Ahvaz

**City**

Ahvaz

**Province**

Khouzestan

**Postal code**

7167776522

**Phone**

+98 61 3333 6316

**Email**

Fakhri.Fatemeh@gmail.com

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

دانشگاه شهید چمران اهواز

**Full name of responsible person**

Dr. Abdulhamid Habibi

**Street address**

Golestan Blvd

**City**

Ahvaz

**Province**

Khouzestan

**Postal code**

7167776522

**Phone**

+98 61 3333 6316

**Email**

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

**Street address**

Golestan Blvd

**City**

Ahvaz

**Province**

Khouzestan

**Postal code**

7167776522

**Phone**

+98 61 3333 6316

**Email**

fakhri.fatemeh@gmail.com

**Person responsible for scientific 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

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**Person responsible for updating data****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

**Street address**

Golestan Blvd.

**City**

Ahvaz

**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