

Clinical Trial Protocol

Iranian Registry of Clinical Trials

23 Jun 2026

The effects of plyometric training with and without additional loads on neuromuscular index and performance in male youth's soccer player

Protocol summary

Study aim

Determination the effects of plyometric training with and without additional loads on neuromuscular index and performance in male youth's soccer players.

Design

The present study is a randomized controlled trial study.

Settings and conduct

39 soccer player (age between 15-17) are selected voluntarily and then randomly divided into three groups: Plyometric training with additional Load (n=13), Plyometric training without additional Load (n=13) and Control Group (n=13). Before and after the intervention, the neuromuscular indicators of people will be evaluated using isokinetic dynamometer and surface electromyogram. Plyometric training with additional Load performs plyometric training for 8 weeks (2 sessions per week) with an additional load equal to 10% of body weight. The Plyometric training without additional Load also performs the same volume as the Plyometric training with additional Load group without applying additional load and only with body weight. Also, the control group only continues their usual soccer training routine.

Participants/Inclusion and exclusion criteria

Gender is male and Age range between 15 and 17, BMI should be between 18-25, At least one year of experience participating in regional soccer, No history of surgery due to sports and musculoskeletal injuries

Intervention groups

1. Control group, 2. Plyometric training with additional load, 3. Plyometric training without additional load

Main outcome variables

Neuromuscular indicators

General information

Reason for update

Changing the age range of participants and sample size

Acronym

IRCT registration information

IRCT registration number: **IRCT20190530043762N2**

Registration date: **2022-11-21, 1401/08/30**

Registration timing: **prospective**

Last update: **2023-12-03, 1402/09/12**

Update count: **1**

Registration date

2022-11-21, 1401/08/30

Registrant information

Name

Alireza Niknam

Name of organization / entity

Shiraz University

Country

Iran (Islamic Republic of)

Phone

+98 71 3613 3318

Email address

alireza.niknam@yahoo.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2022-12-21, 1401/09/30

Expected recruitment end date

2023-01-20, 1401/10/30

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The effects of plyometric training with and without additional loads on neuromuscular index and performance in male youth's soccer player

Public title

The effect of plyometric Training on the neuromuscular indicators of athletes

Purpose

Education/Guidance

Inclusion/Exclusion criteria**Inclusion criteria:**

Age range between 15 and 17 years old Gender is male Body mass index should be between 18-25 The sports field is Soccer (at least one year of experience participating in regional league matches) No history of surgery due to sports and musculoskeletal injuries

Exclusion criteria:

Ages less than 15 and more than 17 years History of injuries leading to medical prohibition to participate in sports activities Body mass index less than 18 and more than 25 Use of prohibited drugs and ergogenic substances in athletes Lack of participation in official football matches Lack of membership in official soccer clubs

Age

From **15 years** old to **17 years** old

Gender

Male

Phase

N/A

Groups that have been masked

- Participant
- Care provider
- Investigator

Sample size

Target sample size: **39**

More than 1 sample in each individual

Number of samples in each individual: **2**

In this study, 2 samples will be taken from each subject. Once before the start of the intervention and once after the end of the intervention. Sampling includes collecting neuromuscular data using surface electromyogram and isokinetic dynamometer.

Randomization (investigator's opinion)

Randomized

Randomization description

Randomization method: Simple randomization Random unit: Individual Randomization Tool: Shuffle Cards Random Sequence Construction Method: The sample selection method will be available in this study and randomly divided into Three distinct groups. Prior to the implementation of the research, 39 young male soccer player (15-17years old) were selected after completing the health questionnaire in physical activity and obtaining personal data. The names of the subjects are recorded on individual cards (each subject has a special card). Then all the cards are thrown in the sphere and are thrown well. After each flipping, a card is removed from the sphere and according to the flipping sequence, they are placed in the control group or intervention 1 or intervention 2. The sequence is that the first card removed is assigned to the control group, the second card removed to intervention 1, and the third card removed to intervention 2. This process is repeated until

all the cards are removed from the sphere and assigned to the studied groups. Then completing and registering names in their groups, to hide the process of grouping the subject, through a letter packed with their status in the study and their group will inform the subject. In this letter, the groups are marked with the number and the full description of each group's actions is mentioned. For example, in the closed letter, the first card that out of the ball, are cited the person's activities during the intervention, and the number of his group (group 1).

Blinding (investigator's opinion)

Single blinded

Blinding description

Subjects, instructors, and experts evaluating are kept blind in this study. In relation to the participant, each subject will be informed about the necessary details of their duties as well as their group number in a closed letter. The letter does not mention the group name and only the group number. However, in order to respect the ethics and rights of the subject, all of the tasks and actions that are to be performed are described. People in the control group will be coded with code 1, people in intervention group 1 with code 2, and people in intervention group 2 with code 3. The information about conducting tests and interventions for each group is fully explained and explained and interpreted in a separate meeting for each group. In addition, in order to perform the research plane, 3 coaches were assigned by a closed letter, while explaining all the training and safety issues for each group. Neuromuscular function tests are also performed by technicians and examiners who are fully aware of how to perform the tests. None of the examiners had any information about the intervention status of the subjects. Therefore, in this study, none of the instructors, subjects, and examiners have any information about the status of the subjects (which group is the intervention group and which one is the control group), although the tasks and all the tests and safety aspects will be describe for them.

Placebo

Not used

Assignment

Parallel

Other design features**Secondary Ids**

empty

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

Shiraz University Biomedical Ethics Committee

Street address

Shiraz University, Jomhour Blvd, Shiraz

City

Shiraz

Province

Fars

Postal code

7194684334

Approval date

2022-07-13, 1401/04/22

Ethics committee reference number

IR.US.REC.1401.002

2**Ethics committee****Name of ethics committee**

Shiraz University Biomedical Ethics Committee

Street address

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Postal code

7194684334

Approval date

2022-07-13, 1401/04/22

Ethics committee reference number

IR.US.REC.1401.002

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

Neuromuscular performance of soccer players

ICD-10 code**ICD-10 code description****Primary outcomes****1****Description**

Maximum isokinetic force and force development rate of knee extensor and flexor muscles

Timepoint

Before and after the intervention (Exercise training)

Method of measurement

The maximum isokinetic force as well as the rate of force development will be measured using the Biodex isokinetic dynamometer when performing knee flexion and extension tasks.

2**Description**

Neuromuscular efficiency

Timepoint

Before and after the intervention (Exercise training)

Method of measurement

Using the surface electromyogram of the knee extensor and flexor muscles during the isometric maximum strength test of knee extension and flexion

3**Description**

Explosive power of lower body muscles

Timepoint

Before and after the intervention (Exercise training)

Method of measurement

Using the Sargent vertical jump test on the Ergo-jump machine

Secondary outcomes

empty

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

The intervention group of body weight plyometric training: for 8 weeks/ 2 sessions per week

Category

Other

2**Description**

The intervention group of additional load plyometric training: for 8 weeks/ 2 sessions per week/ Applying additional load equal to 10% of body weight

Category

Other

3**Description**

Control group: They will continue their usual football training routine in parallel with the intervention groups

Category

Other

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

Shiraz University

Full name of responsible person

Ghasem Taheri

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Republic Blvd., Eram Square, Department of Sports Sciences, Shiraz University, Shiraz

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Shiraz University

Full name of responsible person

Maryam koushkie Jahromi

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

Yes

Title of funding source

Shiraz 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**

Shiraz university

Full name of responsible person

Maryam koushkie Jahromi

Position

Professor

Latest degree

Ph.D.

Other areas of specialty/work

Exercise physiology

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Latest degree

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Person responsible for updating data

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Full name of responsible person

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Position

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Latest degree

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Other areas of specialty/work

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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

Yes - There is a plan to make this available

Clinical Study Report

Yes - There is a plan to make this available

Analytic Code

Yes - There is a plan to make this available

Data Dictionary

Not applicable

Title and more details about the data/document

All the data collected in the present study about the neuromuscular indicators as well as the individual characteristics of the participants can be shared with

researchers.

When the data will become available and for how long

Start accessing the data immediately after the results are published

To whom data/document is available

Academic researchers

Under which criteria data/document could be used

For the purpose of follow-up or meta-analysis studies

From where data/document is obtainable

Shiraz University, Department of Sports Sciences, Dr. Maryam koushie Jahromi

What processes are involved for a request to access data/document

Sending the application and providing the necessary documents for employment in one of the reputable scientific centers to the email address Koushie53@yahoo.com. A response will be sent one week after submitting the request. If agreed, the data will be sent to the researcher as an Excel file.

Comments