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
39soccer 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, Jomhouri 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
Shiraz University, Jomhouri 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

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
Street address
Republic Blvd., Eram Square, Department of Sports Sciences, Shiraz University, Shiraz
City
Shiraz
Province
Fars
Postal code
7194683334
Phone
+98 71 3613 4000
Email
alireza73.niknam@gmail.com

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Shiraz University
Full name of responsible person
Maryam koushkie Jahromi
Street address
Republic Blvd., Eram Square, Department of Sports Sciences, Shiraz University, Shiraz
City
Shiraz
Province
Fars
Postal code
7194684334
Phone
+98 71 3613 4000
Email
alireza73.niknam@gmail.com
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
Street address
Department of Sports Sciences, Shiraz University, Eram Square, Jomohri Blvd., Shiraz
City
Shiraz
Province
Fars
Postal code
7194684334
Phone
+98 71 3613 4000
Email
Koushkie53@yahoo.com

Person responsible for scientific 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
Street address
Department of Sports Sciences, Shiraz University, Eram Square, Jomohri Blvd., Shiraz
City
Shiraz
Province
Fars
Postal code
7194684334
Phone
+98 71 3613 4000
Email
Koushkie53@yahoo.com

Person responsible for updating data

Contact
Name of organization / entity
Shiraz University
Full name of responsible person
Alireza Niknam
Position
Ph.D. Student
Latest degree
Ph.D.
Other areas of specialty/work
Exercise physiology
Street address
Department of Sports Sciences, Shiraz University, Eram Square, Jomohri Blvd., Shiraz
City
Shiraz
Province
Fars
Postal code
7194684334
Phone
+98 71 3613 4000
Email
alireza73.niknam@gmail.com

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 koushkie 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 Koushkie53@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