Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Effects of the Football+ warm-up program on kinematics and kinetics related to anterior cruciate ligament (ACL) injury during single-leg landing in young male soccer players

Protocol summary

Study aim

The aim of the present study was to determine the effect of a 10-week Football+ warm-up program on kinematics and kinetics related to ACL injury in the single-leg landing-jump task and lower limb performance in young amateur soccer players under 23 years of age in Isfahan.

Design

Clinical trial with pretest and posttest design with two parallel groups (intervention group and control group), single-blind, randomization with an allocation ratio of 1:1 on 46 soccer players aged 15 to 21 years who were randomly divided into one of the two intervention groups and the control group through a computer randomization program.

Settings and conduct

Testing Locations: - Rehabilitation School Laboratory, Isfahan University of Medical Sciences - Sports Science Laboratory, University of Isfahan Single-leg landing test from a 30 cm box Static and dynamic Y-balance test Isokinetic strength test Single-leg triple hop test Training Intervention: Intervention group: 10-week Football+ Warm-up Program (3 sessions/week, 20–30 min/session) - Control group: their usual warm-up program. Post-Testing: - All tests were repeated after 10 weeks

Participants/Inclusion and exclusion criteria

Inclusion criteria: Male players aged 15-21 years, no history of ACL injury, no history of lower limb surgery in the past year, three soccer practice sessions per week. Exclusion criteria: Visible lower limb and trunk abnormalities, failure to adhere to 80% of training sessions.

Intervention groups

1. Intervention group (Football+ warm-up Training ,a recently published evidence-based warm-up program to reduce injuries and improve performance in soccer players. 2. Control Group (performed their usual warm-up exercises).

Main outcome variables

Kinematics of the hip and knee joints in the sagittal and frontal planes; kinetics and moments applied to the knee; and ground reaction forces

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20250528065947N1**
Registration date: **2026-04-25, 1405/02/05**
Registration timing: **prospective**

Last update: **2026-04-25, 1405/02/05**
Update count: **0**

Registration date

2026-04-25, 1405/02/05

Registrant information

Name

Arzhang Kiani

Name of organization / entity

Country

Iran (Islamic Republic of)

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+98 61 4363 2597

Email address

arzhangkian@gmail.com

Recruitment status

recruiting

Funding source

Expected recruitment start date

2026-08-21, 1405/05/30

Expected recruitment end date

2026-12-26, 1405/10/05

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Effects of the Football+ warm-up program on kinematics and kinetics related to anterior cruciate ligament (ACL) injury during single-leg landing in young male soccer players

Public title

The Effect of Football+ warm-up program on ACL Injury Risk Factors

Purpose

Prevention

Inclusion/Exclusion criteria

Inclusion criteria:

Participants must sign and submit an informed consent form in accordance with the ethics committee format For players under the age of 18, the informed consent form must be signed and approved by their parents Male players aged between 15 and 21 years No participation in similar injury prevention programs No history of ACL injury No acute lower limb injury in the past 6 months No history of lower limb surgery in the past year No history of neurological disorders Participation in three football training sessions per week

Exclusion criteria:

Failure to provide the informed consent form History of ACL injury Undergoing lower limb surgery within the past year

Age

From **15 years** old to **21 years** old

Gender

Male

Phase

N/A

Groups that have been masked

- Outcome assessor
- Data analyser

Sample size

Target sample size: **46**

Randomization (investigator's opinion)

Randomized

Randomization description

In this study, participants will be randomly assigned to one of two groups (the intervention group: 10 weeks of Football+ warm-up training and the control group: usual training) using the website www.sealedenvelope.com. Randomization will be conducted using a block randomization method with a 1:1 allocation ratio. To ensure allocation concealment, the randomization code will remain concealed from the time of all baseline measurements until the participant enters the trial. For allocation concealment, randomization will be implemented via a computer-generated sequence, using opaque, sequentially numbered, and sealed envelopes. a card inside each envelope will indicate the group assigned to each participant.

Blinding (investigator's opinion)

Single blinded

Blinding description

The present study will employ a single-blind design, in which only the outcome assessors are blind to their group allocation. Outcome measures are assessed at baseline and post-test by a blinded assessor who remains unaware of both the study hypothesis and methodology.

Placebo

Not used

Assignment

Parallel

Other design features

Based on the nature of the subject and its execution, this study is quasi-experimental and applied, using a pre-test and post-test design with two parallel groups. Using G*Power software (version 3.1.9.7, University of Kiel, Germany), the sample size calculation for a 2×2 mixed design, focusing on the time × group interaction effect, shows that 15 participants per group (30 in total) are needed to achieve 80% statistical power with an alpha of 0.05, beta of 0.20, and an effect size of 0.06. To prevent the possibility of subject dropout and to improve statistical power, 23 participants per group (totaling 46) will be considered.

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Research Ethics Committees of University of Isfahan

Street address

Postal Code: 8174673441, University of Isfahan, Esfahan, Iran Azadi Square, ,

City

Esfahan

Province

Isfehan

Postal code

8174673441

Approval date

2026-02-21, 1404/12/02

Ethics committee reference number

IR.UI.REC.1404.278

Health conditions studied

1

Description of health condition studied

Effects of the Football+ warm-up program on kinematics and kinetics related to anterior cruciate ligament (ACL) injury during single-leg landing in young male soccer players

ICD-10 code

ICD-10 code description

Primary outcomes

1

Description
Biomechanical Risk Factors Associated with Anterior Cruciate Ligament Injury
Timepoint
At baseline (pre-intervention) and one week post-training.
Method of measurement
Single-leg landing test from a 30 cm box to assess lower limb kinematics and kinetics

2

Description
Lower extremity performance
Timepoint
At baseline (pre-intervention) and one week post-training.
Method of measurement
Static and dynamic Y balance test

Secondary outcomes

1

Description
Isokinetic strength of the quadriceps and hamstrings
Timepoint
At the beginning of the study (pre-test) and then at the end of the study (post-test)
Method of measurement
Isokinetic dynamometer (Biodex Multi-joint System 3, Biodex Medical Systems, USA)

Intervention groups

1

Description
Intervention Group (Football+ Warm-up training): This is a football-specific injury prevention program recently designed, developed, and implemented by the Movement and Exercise Science group at the Dortmund Institute of Sport Science, in collaboration with Borussia Dortmund Football Club. The program is delivered as a structured warm-up protocol comprising a series of football-specific exercises aimed at both enhancing movement performance and targeting injury risk factors. Designed to ensure high compliance and adherence within football organizations, the Football+ program consists of three components: 1) Foundation, including running and strengthening exercises; 2) Ball-based training and small-sided games (SSGs); and 3) Explosive performance, including plyometric, agility, and speed drills. The Football+ exercises are categorized into three difficulty levels and are modified and adapted every 4 to 6 weeks based on the players' abilities and progress. Each session lasts approximately 20 to 30 minutes and is performed at least twice per week
Category
Prevention

2

Description
Control group: Control (in this study, the control group will perform their usual and common exercises, including running, static and dynamic stretching exercises)
Category
Prevention

Recruitment centers

1

Recruitment center
Name of recruitment center
Isfahan City Football Committee
Full name of responsible person
Mustafa Davoodi
Street address
Bozorgmehr Street, Sharif Al-Nasab Alley
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814658888
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+98 903 399 4385
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Arzhangkian@gmail.com

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
The University of Isfahan
Full name of responsible person
Hamidreza Mirsafian
Street address
Postal Code: 8174673441, University of Isfahan, Isfahan, IranAzadi Square,
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Postal code
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Phone
+98 913 214 2319
Email
h.mirsafian@spr.ui.ac.ir
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?

Yes

Title of funding source
The University of Isfahan

Proportion provided by this source
5

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
University of Isfahan

Full name of responsible person
Arzhang Kiani

Position
PHD student

Latest degree
Master

Other areas of specialty/work
Sport Sciences

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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
Not applicable

Data Dictionary
Not applicable

Title and more details about the data/document
"The data on primary outcomes can be shared

When the data will become available and for how long
"Two months after publication of the results"

To whom data/document is available
All interested parties, including researchers

Under which criteria data/document could be used
There are no other conditions

From where data/document is obtainable
The principal investigator of the study was contacted via email.

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

They must send their request by email to the principal investigator

Comments