Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Acute Effects of Myofascial Chain-Based Dynamic, Conventional Dynamic, and Ballistic Warm-Up Protocols on Neuromuscular Performance in Soccer Players: A Randomized Crossover Trial

Protocol summary

Study aim

Comparison of the acute effects of three warm-up protocols, myofascial chain-based dynamic, conventional dynamic, and ballistic, on neuromuscular performance in male soccer players.

Design

This randomized crossover trial with repeated measures and single-blind design includes 24 male soccer players, each receiving all three warm-up protocols in a randomized order. Randomization is simple and individual, using software, with at least 72 hours between sessions.

Settings and conduct

This study examines neuromuscular performance in soccer players. In three sessions, participants receive three warm-up protocols in randomized order, followed by assessment of jumping, reactive strength index, 20-meter sprint, and change of direction. Sessions are 72 hours apart, with a blinded outcome assessor.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Male soccer players aged 18 to 28 years, with at least 3 years of regular training experience and at least 3 training sessions per week, without lower limb injury or orthopedic surgery during the past 6 months, and without neurological or musculoskeletal disorders affecting test performance; also, no use of medications or supplements affecting neuromuscular performance and informed consent to participate in the study. Exclusion criteria: Presence of lower limb injury or history of orthopedic surgery during the past 6 months, neurological or musculoskeletal disorders affecting test performance, or use of medications and supplements affecting neuromuscular performance at the time of entry into the study.

Intervention groups

Myofascial chain-based dynamic warm-up, conventional dynamic warm-up, and ballistic warm-up. Each lasts 10 minutes, with acute effects on neuromuscular performance assessed afterward.

Main outcome variables

Vertical jump height; reactive strength index; 20-meter sprint speed; change-of-direction ability.

General information

Reason for update

Due to the available sample size, the number of participants was increased.

Acronym

IRCT registration information

IRCT registration number: **IRCT20230612058457N11**
Registration date: **2026-09-30, 1405/07/08**
Registration timing: **prospective**

Last update: **2026-10-29, 1405/08/07**
Update count: **1**

Registration date

2026-09-30, 1405/07/08

Registrant information

Name

Mohammad Alimoradi

Name of organization / entity

Shahid Bahonar University

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Iran (Islamic Republic of)

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-10-01, 1405/07/09

Expected recruitment end date

2026-11-02, 1405/08/11

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Acute Effects of Myofascial Chain-Based Dynamic, Conventional Dynamic, and Ballistic Warm-Up Protocols on Neuromuscular Performance in Soccer Players: A Randomized Crossover Trial

Public title

Comparison of the acute effects of three types of dynamic warm-up on the neuromuscular performance of male soccer players

Purpose

Prevention

Inclusion/Exclusion criteria

Inclusion criteria:

The participants' age should be 18 to 28 years. The participant should be a male player of a competitive soccer team. The participant should have at least 3 years of regular soccer training experience. The participant should have at least 3 soccer training sessions per week. The participant should not have suffered a lower limb injury during the past 6 months. The participant should not have had orthopedic surgery during the past 6 months. The participant should not have any neurological or musculoskeletal disorder affecting the performance of functional tests. The participant should not use any medication or supplement affecting neuromuscular performance during the study period. The participant should provide informed consent to attend all three experimental sessions.

Exclusion criteria:

History of orthopedic surgery during the past 6 months. Presence of a neurological disorder affecting the performance of functional tests. Presence of a musculoskeletal disorder affecting the performance of functional tests. Use of medications affecting neuromuscular performance at the time of entry into the study. Use of supplements affecting neuromuscular performance at the time of entry into the study.

Age

From **18 years** old to **28 years** old

Gender

Male

Phase

N/A

Groups that have been masked

- Outcome assessor

Sample size

Target sample size: **70**

Randomization (investigator's opinion)

Randomized

Randomization description

The sequence of performing the three warm-up protocols for each participant will be determined by simple randomization at the individual level. Each participant will receive all three protocols, including myofascial chain-based dynamic warm-up, conventional dynamic warm-up, and ballistic warm-up, and the order of performing the protocols will be randomly determined using statistical software; in this study, block or stratified randomization will not be used. A random sequence of the three protocols will be generated for each participant and maintained until the end of the study. To ensure allocation concealment, the random sequences will be placed in opaque, non-transparent, sealed envelopes before the start of the study, and after each participant's entry and eligibility verification, the relevant envelope will be opened by an individual independent of the outcome assessment to determine the order of intervention implementation. The outcome assessor will not be aware of the allocation order and the protocol performed in each session. This method is consistent with the crossover design of the study and the randomization of the order of interventions.

Blinding (investigator's opinion)

Single blinded

Blinding description

Participants and the administrator/interventionist will not be blinded to the type of intervention due to the nature and observable differences of the warm-up protocols. Also, the principal investigator and the person responsible for performing the warm-up protocols will be aware of the type of intervention performed. In contrast, the outcome assessor and the person responsible for collecting performance data will not be aware of the allocation order and the type of warm-up protocol performed in each session, and will carry out the outcome assessment without knowledge of the intervention.

Placebo

Not used

Assignment

Crossover

Other design features

This study will be conducted as a randomized crossover trial with repeated measures, in which each participant will receive all three warm-up protocols, including myofascial chain-based dynamic warm-up, conventional dynamic warm-up, and ballistic warm-up, in separate sessions and in a randomized order. Each participant will serve as their own control, and a minimum interval of 72 hours will be considered between sessions. To reduce the influence of environmental factors and physical activity before testing, the sessions will be conducted under similar environmental conditions, and participants will be asked to refrain from intense physical activity during the 24 hours before each session. Performance assessment after each protocol will include the measurement of vertical jump height, reactive strength index, 20-meter sprint speed, and change-of-direction ability.

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Research Ethics Committees of University of Guilan
Street address
5th Kilometer of Persian Gulf Highway, Rasht, Guilan Province, Iran
City
Rasht
Province
Guilan
Postal code
4199613776
Approval date
2026-09-23, 1405/07/01
Ethics committee reference number
IR.GUILAN.REC.1405.082

Health conditions studied

1

Description of health condition studied
Neuromuscular performance; sports warm-up; athletic performance; soccer players.
ICD-10 code
ICD-10 code description

Primary outcomes

1

Description
Vertical jump height
Timepoint
Before to after each warm-up protocol
Method of measurement
My Jump 2 application

2

Description
Reactive strength index (RSI)
Timepoint
Before to after each warm-up protocol
Method of measurement
My Jump 2 application

3

Description
20-meter sprint speed
Timepoint
Before to after each warm-up protocol
Method of measurement
Finish Photo application

4

Description
Change-of-direction ability
Timepoint
Before to after each warm-up protocol
Method of measurement
CODTimer application

Secondary outcomes

empty

Intervention groups

1

Description
Myofascial chain-based dynamic stretching: The protocol consists of four movement stations based on myofascial chains, designed to engage the superficial back line, spiral line, and other movement patterns defined in the protocol. The protocol is performed dynamically and within a functional range of motion, with a total execution time of 10 minutes, including transitions between stations.
Category
Prevention

2

Description
Conventional dynamic stretching: The protocol includes four lower limb muscle groups, including the quadriceps, gluteal muscles, hamstrings, and triceps surae (gastrocnemius-soleus). Each movement is performed in two 30-second sets with 45 seconds of rest between movements. The movements are performed in a swinging and controlled manner through the full joint range of motion, with execution speed gradually increasing. The total duration of the protocol, including transitions between stations, is 10 minutes.
Category
Prevention

3

Description
Ballistic stretching: The protocol includes the same four muscle groups, the quadriceps, gluteal muscles, hamstrings, and triceps surae, and is performed in two 30-second sets with 45 seconds of rest between movements. In each set, the participant first holds the stretched position at maximum range for 5 seconds, then performs 5 seconds of bouncing movements with increasing range; this pattern is repeated until the 30 seconds are completed. The total duration of the protocol is 10 minutes.
Category
Prevention

4

Description
There is no independent control intervention; the study is conducted as a crossover trial, and each participant serves as their own control.
Category
N/A

Recruitment centers

1

Recruitment center
Name of recruitment center
Mes Kerman Football Club
Full name of responsible person
Mohammad Alimoradi
Street address
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
University of Guilan
Full name of responsible person
Ali Basti
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Rasht, Persian Gulf Highway, Kilometer 5 of Tehran Road, University of Gilan Complex
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basti@guilan.ac.ir
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
University of Guilan
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
Shahid Bahonar University
Full name of responsible person
Mohammad Alimoradi
Position
Graduated Student
Latest degree
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Other areas of specialty/work
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Person responsible for updating data

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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
No - There is not a plan to make this available
Analytic Code
Yes - There is a plan to make this available
Data Dictionary
Yes - There is a plan to make this available
Title and more details about the data/document
All data will be shareable after anonymization of participants.
When the data will become available and for how long
All data will be shared after anonymization, and access will be available immediately upon publication of the results.
To whom data/document is available
The data will be accessible to researchers, organizations, and relevant football authorities for journal publication purposes.
Under which criteria data/document could be used
This is aimed at contributing to scientific research and advancing practical objectives, with a focus on reducing musculoskeletal injuries and improving the performance of football players.
From where data/document is obtainable
Mohammad Alimoradi/malimoradisport@gmail.com
What processes are involved for a request to access data/document
Requests for data access will be responded to within one week. سایر توضیحات فا خالی
Comments