Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

The effect of comprehensive injury prevention warm-up exercises PEP on dynamic balance and knee joint range of motion in female volleyball players.

Protocol summary

Study aim

Determining the effect of an 8-week comprehensive PEP injury-prevention warm-up program on dynamic balance and knee joint range of motion in female volleyball players aged 14 to 18.

Design

Using the Power-G program with a test power of 80%, a significance level (α) of 0.05, and an effect size of 0.5 the required sample size was calculated to be 27 participants. Accounting for a 10% attrition rate, the total sample size was set at 30 participants, who will be randomly assigned to two groups of 15 (an intervention group and a control group).

Settings and conduct

The intervention group in addition to general warm-up exercises will perform the PEP warm-up protocol, whereas the control group will perform only general warm-up exercises. Finally, dynamic balance and knee joint range of motion will be assessed for each group.

Participants/Inclusion and exclusion criteria

1. Female volleyball players aged 14 to 18. 2. Athlete's personal consent to participate in the study. 3. At least one year of experience in volleyball. 4. No history of severe injury (resulting in more than three weeks of absence from sports) or orthopedic surgery on the lower extremities within the past year. 5. Absence of knee abnormalities.

Intervention groups

The PEP program, developed by the Santa Monica Sports Medicine Research Foundation to prevent sports injuries, consists of five components including warm-up, strength, agility, stretching, and plyometric exercises designed to coordinate and strengthen the muscles that stabilize the knee joint. This program is to be performed three times a week for eight weeks; the 24-minute routine takes place at the start of the training session following general warm-up exercises as a specialized warm-up, and post-test assessments will be conducted on both the intervention and control groups upon completion of the period.

Main outcome variables

dynamic balance - knee joint ROM

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20260521069479N1**
Registration date: **2026-07-16, 1405/04/25**
Registration timing: **prospective**

Last update: **2026-07-16, 1405/04/25**
Update count: **0**

Registration date

2026-07-16, 1405/04/25

Registrant information

Name
Zahra Karimzadeh Bardeh
Name of organization / entity
The University of Arak
Country
Iran (Islamic Republic of)
Phone
+98 31 3226 2608
Email address
z.karimzadeh.03@msc.araku.ac.ir

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2026-07-23, 1405/05/01

Expected recruitment end date

2026-09-23, 1405/07/01

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The effect of comprehensive injury prevention warm-up exercises PEP on dynamic balance and knee joint range of motion in female volleyball players.

Public title

The effect of PEP on dynamic balance and knee joint range of motion.

Purpose

Supportive

Inclusion/Exclusion criteria

Inclusion criteria:

Female volleyball player aged 14 to 18. Athlete's personal consent to participate in the study. At least one year of experience in volleyball. No history of severe injury (resulting in more than three weeks of absence from the sport) or orthopedic surgery on the lower extremities within the past year. Absence of knee abnormalities.

Exclusion criteria:

history of severe injury (resulting in more than three weeks of absence from the sport) or orthopedic surgery on the lower extremities within the past year. knee abnormalities.

Age

From **14 years** old to **18 years** old

Gender

Female

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **30**

Randomization (investigator's opinion)

Randomized

Randomization description

Sealed envelopes will be prepared, corresponding to the number of study participants; half will contain PEP exercises, and the other half will contain general warm-up exercises. Based on the envelope selected, each individual will be assigned to either the intervention group (PEP) or the control group (general warm-up).

Blinding (investigator's opinion)

Not blinded

Blinding description

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics committee of Arak University

Street address

Arak, Basij Square, Karbala Blvd, Arak University

City

Arak

Province

Markazi

Postal code

3818175846

Approval date

2026-02-25, 1404/12/06

Ethics committee reference number

IR.ARAKU.REC.1404.070

Health conditions studied

1

Description of health condition studied

dynamic balance and knee joint range of motion

ICD-10 code

S83

ICD-10 code description

Dislocation and sprain of joints and ligaments of knee

Primary outcomes

1

Description

The athlete's dynamic balance level.

Timepoint

8-week

Method of measurement

The Y-Balance Test (YBT) will be used to assess dynamic balance.

2

Description

The athlete's knee joint range of motion.

Timepoint

8-week

Method of measurement

A goniometer will be used to assess the range of motion of the knee joint.

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group: A group of athletes who, in addition to general warm-up exercises, will perform the PEP program three times a week for eight weeks specifically for 24 minutes at the start of the training session, following the general warm-up.
Category
Prevention

2

Description
Control group: A group of athletes who, acting as a control group, will perform only general warm-up exercises and be monitored.
Category
Prevention

Recruitment centers

1

Recruitment center
Name of recruitment center
Khamseh-Ashar Stadium, Isfahan
Full name of responsible person
Zahra Karimzadeh Bardehei
Street address
alley 40, North Farsan Street, Asgariyeh Street
City
Esfahan
Province
Isfehan
Postal code
8199733733
Phone
+98 31 3226 2608
Email
krzzahra1375krz@gmail.com

Sponsors / Funding sources

1

Sponsor
Name of organization / entity
The University of Arak
Full name of responsible person
Shahnaz Shahrjeri
Street address
Arak University, Karbala Blvd, Basij Square
City
Arak
Province
Markazi
Postal code
3818175846
Phone
+98 86 3262 0000
Email
s-shahrjerdi@araku.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 Arak
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
The University of Arak
Full name of responsible person
Zahra Karimzadeh Bardehei
Position
Master Student
Latest degree
Bachelor
Other areas of specialty/work
Master of Sports Pathology
Street address
Alley 40, North Farsan Street, Asgariyeh Street.
City
Esfahan
Province
Isfehan
Postal code
8199733733
Phone
+98 31 3226 2608
Email
krzzahra1375krz@gmail.com

Person responsible for scientific inquiries

Contact
Name of organization / entity
The University of Arak.
Full name of responsible person
Zahra Karimzadeh Bardehei
Position
Master Student
Latest degree
Bachelor
Other areas of specialty/work
Master of Sports Pathology

Street address
Alley 40, North Farsan Street, Asgariyeh Street
City
Esfahan
Province
Isfehan
Postal code
8199733733
Phone
+98 31 3226 2608
Email
krzzahra1375krz@gmail.com

Person responsible for updating data

Contact
Name of organization / entity
The University of Arak
Full name of responsible person
Zahra Karimzadeh Bardehei
Position
Master student
Latest degree
Bachelor
Other areas of specialty/work
Master of Sports Patholiogy
Street address
Alley 40, North Farsan Street, Asgariyeh Street
City
Esfahan
Province
Isfehan
Postal code
8199733733
Phone
+98 31 3226 2608
Fax
Email
krzzahra1375krz@gmail.com

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