

Clinical Trial Protocol

Iranian Registry of Clinical Trials

11 Sep 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

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Recruitment status

recruiting

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

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Esfahan

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8199733733

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Email

krzzahra1375krz@gmail.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

The University of Arak

Full name of responsible person

Shahnaz Shahrjeri

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Arak University, Karbala Blvd, Basij Square

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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

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Person responsible for scientific inquiries

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Name of organization / entity

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Person responsible for updating data**Contact****Name of organization / entity**

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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