

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

10 Jun 2026

### The effect of two common corrective and scapular-focused training approaches on shoulder strength, range of motion, proprioception, shoulder girdle function, and scapulohumeral rhythm in female athletes with scapular dyskinesis

#### Protocol summary

##### Study aim

to compare the effects of two common corrective exercises and scapular-focused approaches on the strength, range of motion, and proprioception of the shoulder joint, shoulder girdle function, and scapulo-humeral rhythm in female athletes who are suffering from scapular dyskinesis.

##### Design

The present study has three groups: Intervention group 1: common corrective exercises. Intervention group 2: scapular-focused exercises, and control group: no exercise. This study is a randomized controlled trial with a control group, with parallel groups and with a sample size of 36 people.

##### Settings and conduct

The first stage was the selection of subjects based on the inclusion criteria; the second stage was random grouping with blinding of subjects; the third stage was the pre-test; the fourth stage was two months of training; the fifth stage was the post-test. The testing and training locations were the laboratory of the Faculty of Physical Education, Shahid Bahonar University, Kerman, and the Palladium Club and Ardeshir Hemmati Club in Kerman, respectively.

##### Participants/Inclusion and exclusion criteria

Inclusion criteria People with scapular dyskinesis confirmed by the McClure test exclusion criteria Acute injury to the scapula and shoulder, including fractures and dislocations A history of injury to the aforementioned area in the past six months A history of shoulder surgery Receiving any type of rehabilitation and exercise therapy in the past six months Having pain greater than 3 on the VAS scale

##### Intervention groups

Experimental group 1: common corrective exercises, Experimental group 2: scapular-focused exercises, and

Control group: No exercise.

##### Main outcome variables

Shoulder joint strength; shoulder joint range of motion; shoulder joint proprioception; shoulder girdle function and scapulo-humeral rhythm

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20250821066942N1**

Registration date: **2026-02-07, 1404/11/18**

Registration timing: **retrospective**

Last update: **2026-02-07, 1404/11/18**

Update count: **0**

##### Registration date

2026-02-07, 1404/11/18

##### Registrant information

##### Name

Zahra Mahdavi Jafari

##### Name of organization / entity

Shahid Bahonar University of Kerman

##### Country

Iran (Islamic Republic of)

##### Phone

+98 34 3132 3188

##### Email address

zahra.mahdavi.jafari@sport.uk.ac.ir

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2025-04-21, 1404/02/01  
**Expected recruitment end date**  
2025-07-23, 1404/05/01  
**Actual recruitment start date**  
2025-05-22, 1404/03/01  
**Actual recruitment end date**  
2025-08-23, 1404/06/01  
**Trial completion date**  
2025-08-23, 1404/06/01

#### Scientific title

The effect of two common corrective and scapular-focused training approaches on shoulder strength, range of motion, proprioception, shoulder girdle function, and scapulohumeral rhythm in female athletes with scapular dyskinesia

#### Public title

The effect of two common corrective and scapular-focused training approaches in athletes with scapular dyskinesia

#### Purpose

Treatment

#### Inclusion/Exclusion criteria

##### Inclusion criteria:

Individuals with scapular dyskinesia confirmed by the Mc Clure test  
Female gender  
Age 13 to 20 years  
Playing volleyball or basketball at least three times a week  
Having skills at the junior league level

##### Exclusion criteria:

Acute injury to the scapula and shoulder, including fractures and dislocations, because it prevented exercise  
History of injury to the mentioned area in the past six months  
History of shoulder surgery  
Receiving any type of rehabilitation and exercise therapy in the past six months  
Having pain greater than 3 on the VAS scale

#### Age

From **13 years** old to **20 years** old

#### Gender

Female

#### Phase

N/A

#### Groups that have been masked

*No information*

#### Sample size

Target sample size: **45**

Actual sample size reached: **36**

#### Randomization (investigator's opinion)

Randomized

#### Randomization description

The researcher randomly assigns the subjects to one of three study groups, including the corrective exercise program, the scapular-focused program, and the control group, using the website (<https://www.randomizer.org>). On this website, the researcher must complete the relevant information and then click the calculate button. Questions and answers include: How many sets of numbers do you want to generate? 3. How many numbers per set? 12. Number range: 1-36. Do you wish each number in a set to remain unique? Yes. Do you wish to sort the numbers that are generated? No. The result of the calculation will be 3 sets of 12 unique numbers in

each set.

#### Blinding (investigator's opinion)

Not blinded

#### Blinding description

Not used

#### Assignment

Parallel

#### Other design features

## Secondary Ids

empty

## Ethics committees

### 1

#### Ethics committee

##### Name of ethics committee

Ethics Committee of Kerman University of Medical Sciences

##### Street address

Ebn-e-Sina St.,Jahad Blvd., Kerman, Iran

##### City

Kerman

##### Province

Kerman

##### Postal code

7616913555

#### Approval date

2025-08-12, 1404/05/21

#### Ethics committee reference number

IR.KMU.REC.1404.276

## Health conditions studied

### 1

#### Description of health condition studied

Scapular dyskinesia

#### ICD-10 code

M25.819

#### ICD-10 code description

Other specified joint disorders, unspecified shoulder

## Primary outcomes

### 1

#### Description

Shoulder joint strength

#### Timepoint

Measuring the strength variable in the pre-test and measuring it again after the training period in the post-test.

#### Method of measurement

Using a hand-held dynamometer in internal and external shoulder rotation movements

## 2

### **Description**

Shoulder joint range of motion

### **Timepoint**

Measuring the range of motion variable in the pre-test and measuring it again after the training period in the post-test.

### **Method of measurement**

Using a universal goniometer in internal and external shoulder rotation movements

## 3

### **Description**

Shoulder joint proprioception

### **Timepoint**

Measuring the proprioception variable in the pre-test and measuring it again after the training period in the post-test.

### **Method of measurement**

Using a digital inclinometer to measure the error rate of reconstructing the 90-degree abduction angle

## 4

### **Description**

Upper limb function

### **Timepoint**

Measuring the Upper limb function variable in the pre-test and measuring it again after the training period in the post-test.

### **Method of measurement**

By CKQUEST test

## 5

### **Description**

Scapulo-humeral rhythm

### **Timepoint**

Measuring the Scapulo-humeral rhythm variable in the pre-test and measuring it again after the training period in the post-test.

### **Method of measurement**

By two digital inclinometers

## **Secondary outcomes**

empty

## **Intervention groups**

### 1

#### **Description**

First intervention group: The group receiving common corrective exercises to correct scapular dyskinesis. This group performed neuromuscular and strengthening exercises targeting the scapula area for 8 weeks, 3 days a week, in a gym under the direct supervision of the researcher, following the protocol outlined by Hotta et al. (2018).

#### **Category**

Rehabilitation

### 2

#### **Description**

Second intervention group: The group receiving scapular-focused exercises to correct shoulder dyskinesis. This group performed shoulder-stretching and strengthening exercises for 6 weeks at home every day under the indirect supervision of the researcher, according to the protocol of Tang et al. (2024).

#### **Category**

Rehabilitation

### 3

#### **Description**

Control group: The group with no training.

#### **Category**

Other

## **Recruitment centers**

### 1

#### **Recruitment center**

##### **Name of recruitment center**

Shahid Bahonar University of Kerman

##### **Full name of responsible person**

Zahra Mahdavi Jafari

##### **Street address**

Imam Khomeini Highway., Research Square

##### **City**

Kerman

##### **Province**

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##### **Postal code**

7616913439

##### **Phone**

+98 34 3132 3188

##### **Email**

zahra.mahdavi.jafari@sport.uk.ac.ir

## **Sponsors / Funding sources**

### 1

#### **Sponsor**

##### **Name of organization / entity**

Shahid Bahonar University of Kerman

##### **Full name of responsible person**

Mansour Sahebozamani

##### **Street address**

Imam Khomeini Highway., Research Square

##### **City**

Kerman

##### **Province**

Kerman

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##### **Phone**

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**Email**

sahebozamani@uk.ac.ir

**Grant name****Grant code / Reference number****Is the source of funding the same sponsor organization/entity?**

Yes

**Title of funding source**

Shahid Bahonar University of Kerman

**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 of Kerman

**Full name of responsible person**

Zahra Mahdavi Jafari

**Position**

PhD student

**Latest degree**

Master

**Other areas of specialty/work**

Sport injuries and corrective exercises

**Street address**

Imam Khomeini Highway, Research Square, Shahid Bahonar University, Faculty of Sport Sciences

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**Person responsible for scientific inquiries****Contact****Name of organization / entity**

Shahid Bahonar University of Kerman

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Phd student

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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**

Not applicable

**Analytic Code**

Not applicable

**Data Dictionary**

Not applicable

**Title and more details about the data/document**

With permission from the supervisor and coordination with the specialized department of sport pathology and biomechanics of Shahid Bahonar University of Kerman, all information can be shared after being de-identified.

**When the data will become available and for how long**

After publishing the article/articles extracted from the study

**To whom data/document is available**

The data can be displayed and shared upon reasonable and formal request by the Iranian Clinical Trial Registry Center, journals, and individuals/academic researchers who are conducting research and scientific activities in this field.

**Under which criteria data/document could be used**

Data analysis and use of documentation can only be done on the condition that their results are reported in scientific articles conducted by academic researchers and authors. The requirements for sending data and

documentation include: 1. Sending an email (preferably with a valid academic address) to one of the study researchers 2. A brief and logical explanation regarding how the data or documentation will be used.

**From where data/document is obtainable**

By request from researcher Zahra Mahdavi Jafari  
zahra.mahdavi.jafari@sport.uk.ac.ir

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

The applicant can receive the necessary information by contacting researcher Zahra Mahdavi Jafari and coordinating with the specialized department of Sports Pathology and Biomechanics at Shahid Bahonar University of Kerman.

**Comments**