

Clinical Trial Protocol

Iranian Registry of Clinical Trials

12 Sep 2026

Comparison the Effect of local Scapula-Focused and Functional Kinetic Chain Exercise Programs on Proprioception, Range of Motion and Upper Limb Function in Overhead Athletes with Scapula Dyskinesia

Protocol summary

Study aim

Comparison the effect of scapula-focused and kinetic chain exercises on proprioception, range of motion and upper limb function in overhead athletes with scapula dyskinesia

Design

Two arm parallel group randomized trial with blinded outcome assessment

Settings and conduct

The present study was an interventional, semi-experimental, and applied research design. All participants performed the exercises under the supervision of a corrective exercise specialist for 8 weeks in their respective groups. Assessments were conducted one week prior to the intervention and after the two 8-week interventions by a blinded evaluator. The measured variables included pain, disability, muscle strength, and proprioception. All measurements were carried out in the university laboratory.

Participants/Inclusion and exclusion criteria

Inclusion Criteria: Males aged 18–30, ≥ 3 years in overhead sports, positive Kibler lateral scapular slide test, and VAS pain score 3–7. Exclusion Criteria: Lack of consent, abnormal BMI, shoulder trauma, fracture, dislocation, ROM limitation, upper limb surgery in past 2 years, structural deformities (kyphosis, scoliosis), or neurological/musculoskeletal disorders limiting motion.

Intervention groups

Experimental Group 1 (Scapula-Focused): Performed 8 strengthening exercises for the serratus anterior, middle and lower trapezius, and rotator cuff to improve scapulohumeral rhythm and glenohumeral stability. Experimental Group 2 (Kinetic Chain): Performed 11 exercises involving upper limbs, trunk, and lower limbs to enhance neuromuscular coordination and force transfer, including dynamic movements mimicking daily and sports activities.

Main outcome variables

proprioception, range of motion, upper limb function

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20241202063918N1**

Registration date: **2026-08-06, 1405/05/15**

Registration timing: **prospective**

Last update: **2026-08-06, 1405/05/15**

Update count: **0**

Registration date

2026-08-06, 1405/05/15

Registrant information

Name

Nima Tadbiri

Name of organization / entity

Kharazmi University

Country

Iran (Islamic Republic of)

Phone

+98 21 4465 7491

Email address

nima.tadbiri@gmail.com

Recruitment status

recruiting

Funding source

Expected recruitment start date

2026-09-05, 1405/06/14

Expected recruitment end date

2026-10-06, 1405/07/14

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison the Effect of local Scapula-Focused and Functional Kinetic Chain Exercise Programs on Proprioception, Range of Motion and Upper Limb Function in Overhead Athletes with Scapula Dyskinesia

Public title

Effect of scapula - focused and kinetic chain exercises in athletes with scapula dyskinesia

Purpose

Treatment

Inclusion/Exclusion criteria**Inclusion criteria:**

Aged between 18 and 30 Being male with at least 3 years experience in overhead sports A positive Kibler lateral scapula side test performed by a physiotherapist Pain intensity of 3 to 7 on the Visual Analog Scale

Exclusion criteria:

Lack of willingness or dissatisfaction of the individual to participate in or continue the test Abnormal body mass index History of trauma, fracture or shoulder joint dislocation Limited shoulder range of motion History of upper limb surgery in the past 2 years Presence of structural abnormalities in the shoulder or thoracic, such as kyphosis or scoliosis Presence of neurological or musculoskeletal diseases that cause movement limitations

AgeFrom **18 years** old to **30 years** old**Gender**

Male

Phase

N/A

Groups that have been masked

- Participant
- Outcome assessor

Sample sizeTarget sample size: **45****Randomization (investigator's opinion)**

Randomized

Randomization description

Following the baseline examination, by using the method on the website <http://randomizer.org> participants are randomly assigned into the two experimental groups (neuromuscular training with an attentional focus), (therapeutic exercise), and control group. Simple randomization is used. Concealed allocation is performed using a computer generated block randomized table of numbers (1 and 2 for experimental groups and 3 for control group) created before the start of data collection by researcher who is not involved in the recruitment or treatment of patients. Then, the random numerical sequence is placed in sealed opaque envelope and processed with treatment according to the group assignment. A blinded outcome assessor who does not know the hypothesis and study methods, measures

outcome at baseline and 8 weeks post-intervention.

Blinding (investigator's opinion)

Single blinded

Blinding description

In this study, blinding will be carried out in a single-blind manner. This means that only the participants and outcome assessor will be unaware of the type of intervention and the group to which they have been allocated (experimental or control), while the main researchers will be aware of the allocation. To minimize bias, the allocation of participants to groups will be performed using a block randomization method by an individual independent from the data collection team. Participants will be informed that they are taking part in a comparative study, but details about the exact type of intervention and the differences between groups will not be disclosed. All interventions will be delivered under similar timing and environmental conditions so that no obvious differences are detectable by the participants. Additionally, participants will be asked to refrain from inquiring about the type of intervention or comparisons with the other group. Data collection will be carried out by a trained assessor who, as much as possible, will remain minimally informed about the final objectives and main hypotheses of the study, in order to reduce observer bias in outcome measurement. In case of circumstances where blinding may be compromised (such as direct questioning by a participant or specific side effects), such events will be documented and considered in the final analysis.

Placebo

Not used

Assignment

Parallel

Other design features**Secondary Ids**

empty

Ethics committees**1****Ethics committee****Name of ethics committee**

Ethics committee of Kharazmi University

Street address

Faculty of Physical Education, South Razan;
Mirdamad;Tehran

City

Tehran

Province

Tehran

Postal code

1393953696

Approval date

2025-06-24, 1404/04/03

Ethics committee reference number

IR.KHU.REC.1404.066

Health conditions studied

1

Description of health condition studied

Scapula Dyskinesis

ICD-10 code

M25.819

ICD-10 code description

Other specified joint disorders, unspecified shoulder

Primary outcomes

1

Description

proprioception

Timepoint

Pre-test (before the start of the study) and post-test (at the end of the study)

Method of measurement

Passive proprioception of the shoulder during internal and external rotation will be measured using an isokinetic dynamometer.

Secondary outcomes

1

Description

range of motion

Timepoint

Pre-test (before the start of the study) and post-test (at the end of the study)

Method of measurement

The range of motion variable will be assessed by a goniometer

2

Description

upper limb function

Timepoint

Pre-test (before the start of the study) and post-test (at the end of the study)

Method of measurement

The Y - Balance test will be used to assess upper limb function

Intervention groups

1

Description

Intervention group: First Intervention group: The scapula-focused exercise protocol was implemented over 8 weeks with three 60-minute sessions per week. Each session included a 10-minute warm-up, the main exercise phase, and a 10-minute cool-down. The main phase consisted of 8 selected exercises designed to strengthen and stabilize key scapular muscles, including

the serratus anterior, middle and lower trapezius, and the rotator cuff. Each exercise was performed in 3 sets of 10 repetitions, and progression was applied by gradually increasing the number of sets and repetitions to enhance shoulder strength, stability, and scapulohumeral rhythm in a structured manner.

Category

Treatment - Other

2

Description

Intervention group: Second Intervention group: The kinetic chain rehabilitation protocol was carried out over 8 weeks, with three 60-minute sessions per week. Each session consisted of a 10-minute dynamic warm-up, the main exercise phase, and a 10-minute cool-down. The main phase included 11 selected exercises designed to integrate the upper limbs, trunk, and lower limbs through kinetic chain patterns. These exercises involved movements such as lunges with overhead press, diagonal chop and lift, push-up plus, single-leg squat with reach, and dynamic throwing or pulling tasks, aiming to simulate force transmission from the lower limbs to the shoulder girdle. Each exercise was initially performed in 3 sets of 10 repetitions, with progression achieved by gradually increasing to 4 sets of 12 repetitions and then 5 sets of 10 repetitions. This structured progression was intended to enhance neuromuscular coordination, improve force transfer, and optimize functional performance in both daily and sport-related activities.

Category

Treatment - Other

3

Description

Control group: Control group: The control group will not receive any intervention during the 8 week training protocol comprises kinetic chain and scapula focused exercises and they will continue their daily routine basis.

Category

N/A

Recruitment centers

1

Recruitment center

Name of recruitment center

Kharazmi University

Full name of responsible person

Seyed Sadreddin Shojaeddin

Street address

Kharazmi Faculty of Physical Education and Sports Sciences, at the end of Hesari Street, Mirdamad Boulevard

City

Tehran

Province

Tehran

Postal code
15875-4398
Phone
+98 21 2222 8001
Email
nima.tadbiri@gmail.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity
Kharazmi University
Full name of responsible person
Farhad Ghadiri
Street address
Center for Human Movement Sciences Kharazmi
University Mirdamad, South Razan Street, Hesari
Street, Keshvari Sport Complex
City
Tehran
Province
Tehran
Postal code
1571914911
Phone
+98 21 2222 1008
Email
ghadiri@khu.ac.ir

Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?

No

Title of funding source

Kharazmi University Research and Technology Deputy

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
Kharazmi Univerasity
Full name of responsible person
Seyed Sadraeddin Shoajeddin
Position
Professor
Latest degree
Ph.D.
Other areas of specialty/work
Corrective exercises

Street address

Center for Human Movement Sciences Kharazmi
University Mirdamad, South Razan Street, Hesari
Street, Keshvari Sport Complex

City

Tehran

Province

Tehran

Postal code

1571914911

Phone

+98 21 2222 1008

Email

sa_shojaedin@yahoo.com

Person responsible for scientific inquiries

Contact

Name of organization / entity
Kharazmi University
Full name of responsible person
Seyed Sadraeddin Sjojaeddin
Position
Professor
Latest degree
Ph.D.
Other areas of specialty/work
Corrective exercises

Street address

Center for Human Movement Sciences Kharazmi
University Mirdamad, South Razan Street, Hesari
Street, Keshvari Sport Complex

City

Tehran

Province

Tehran

Postal code

1571914911

Phone

+98 21 2222 8001

Email

sa_shojaedin@yahoo.com

Person responsible for updating data

Contact

Name of organization / entity
Kharazmi University
Full name of responsible person
Seyed Sadraeddin Shojaeedin
Position
Kharazmi University
Latest degree
Ph.D.
Other areas of specialty/work
Corrective exercises

Street address

Center for Human Movement Sciences Kharazmi
University Mirdamad, South Razan Street, Hesari
Street, Keshvari Sport Complex

City

Tehran
Province
Tehran
Postal code
1571914911
Phone
+98 21 2222 1008
Email
sa_shojaedin@yahoo.com

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

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

Title and more details about the data/document

Demographic and outcomes-related data are the files

which will be shared.

When the data will become available and for how long

After publishing paper(s) extracted from the study.

To whom data/document is available

The data can be displayed and shared at the reasonable request of the Iranian Clinical Trial Registration center, journals, and University individuals/ researchers who are conducting research and scientific activities related to this field.

Under which criteria data/document could be used

Data analysis and the use of documentation can only be provided which their results are reported in systematic review articles by academic researchers and authors. Requirements for sharing data and documents include: 1. To Send an email (preferably with a valid university address) to one of the study researchers/ authors 2. A brief and logical explanation of how to use the data or documentations. 3.Ensuring That the protocol the protocol for systematic review studies, any accessing request to data or documentations will be recorded.

From where data/document is obtainable

Through asking from authors; Seyed Sadraeddin Shojaeddin and Nima Tadbiri sa_shojaedin@yahoo.com - nimatadbiri@gmail.com

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

The applicant can request details from the researchers within 7-10 days by an official message sent via an email.

Comments