Clinical Trial Protocol
Iranian Registry of Clinical Trials

10 Jun 2026

Comparison the Effect of Scapula-Focused Exercises and Kinetic Chain Rehabilitation on Strength, proprioception, pain and disability on Athletes with Scapula Dyskinesia

Protocol summary

Study aim
Comparison the effect of scapula-focused and kinetic chain exercises on strength, proprioception, pain and disability of athlete 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
muscle strength, proprioception, pain and disability

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20250827067022N1**
Registration date: **2025-09-22, 1404/06/31**
Registration timing: **prospective**

Last update: **2025-09-22, 1404/06/31**
Update count: **0**

Registration date
2025-09-22, 1404/06/31

Registrant information
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Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2025-10-03, 1404/07/11

Expected recruitment end date
2025-11-04, 1404/08/13

Actual recruitment start date
empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Comparison the Effect of Scapula-Focused Exercises and Kinetic Chain Rehabilitation on Strength, proprioception, pain and disability on 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

Age

From **18 years** old to **30 years** old

Gender

Male

Phase

N/A

Groups that have been masked

- Participant
- Outcome assessor

Sample size

Target 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

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Postal code

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Approval date

2025-06-25, 1404/04/04

Ethics committee reference number

IR.KHU.REC.1404.066

Health conditions studied

1

Description of health condition studied
Scapula dyskinesia
ICD-10 code
M25.819
ICD-10 code description
Other specified joint disorders, unspecified shoulder

Primary outcomes

1

Description
pain
Timepoint
Pre-test(before the start of the study) and post-test(at the end of the study)
Method of measurement
The pain variable was measured by a visual pain intensity scale.

Secondary outcomes

1

Description
disability
Timepoint
Pre-test (before the start of the study) and post-test (at the end of the study)
Method of measurement
The DASH questionnaire was used to assess functional impairment in daily activities.

2

Description
muscle strength
Timepoint
Pre-test (before the start of the study) and post-test (at the end of the study)
Method of measurement
Shoulder muscle strength during internal and external rotation was assessed in a concentric–concentric mode using an isokinetic dynamometer under standardized laboratory conditions.

3

Description
joint position sense
Timepoint
Pre-test (before the start of the study) and post-test (at the end of the study)
Method of measurement
Active proprioception of the shoulder during internal and external rotation was measured using an isokinetic dynamometer.

Intervention groups

1

Description
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
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: 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
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Sponsors / Funding sources

1

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Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
No
Title of funding source
No governmental fund has been received for this study, and it is conducted by researchers.
Proportion provided by this source
100
Public or private sector
Private
Domestic or foreign origin
Domestic
Category of foreign source of funding
empty
Country of origin
Type of organization providing the funding
Persons

Person responsible for general inquiries

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