Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Comparison of kinetic chain exercises and scapula stabilization exercises on rest position of scapula, pain and function of shoulder in overhead athletes with impingement syndrome

Protocol summary

Study aim

Comparison of scapular stability exercises and the combination of chain exercises and scapular stability exercises in patients with shoulder impingement syndrome If the results of the study show that adding components of the movement chain to scapular stability exercises can provide more recovery for these patients, we will emphasize more on this model of exercise therapy for these patients.

Design

A double-blind randomized controlled clinical trial. Randomization is done using a sealed envelope.

Settings and conduct

The assessment process is taught to the patients by the physiotherapist at the Diani Physiotherapy Clinic or the Rehabilitation Faculty of Tehran University. Evaluation is done only in the first session and at the end of the fourth week. The remaining sessions (12 sessions in total) are limited to exercises (8 exercises). The patients and the evaluator do not know about the grouping of the participants.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Men and women amateur athletes of overhead sports (volleyball, basketball, handball, badminton, tennis) with shoulder impingement syndrome (Neer classification stage 1 and 2) Age range from 17 to 45 years Exclusion criteria: Having a history of surgery, fracture, dislocation in the shoulder area in the last 12 months The presence of grade 3 tears in the rotator cuff muscles Type 3 acromion Adhesive capsulitis of the shoulder

Intervention groups

scapular stability exercises (control group) scapular stability exercises with the addition of chain components (intervention group)

Main outcome variables

scapula rest position pain (VAS) Functional disability of the shoulder (DASH) Upper limb closed chain function

General information

Reason for update

Dear Sir/Madam, The actual start date and the sampling date have been entered. We kindly request that you review them. Thank you

Acronym

IRCT registration information

IRCT registration number: **IRCT20240614062130N1**
Registration date: **2024-07-20, 1403/04/30**
Registration timing: **prospective**

Last update: **2026-08-31, 1405/06/09**
Update count: **1**

Registration date

2024-07-20, 1403/04/30

Registrant information

Name

Sayeh Moosavi Chavoshi

Name of organization / entity

Country

Iran (Islamic Republic of)

Phone

+98 21 7760 0274

Email address

sayeh_moosavi183@yahoo.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2024-07-20, 1403/04/30

Expected recruitment end date

2024-10-21, 1403/07/30

Actual recruitment start date

2024-08-15, 1403/05/25

Actual recruitment end date

2024-12-28, 1403/10/08

Trial completion date

2024-12-28, 1403/10/08

Scientific title

Comparison of kinetic chain exercises and scapula stabilization exercises on rest position of scapula, pain and function of shoulder in overhead athletes with impingement syndrome

Public title

The effect of motor chain exercises with scapular stability exercises on scapular resting state, pain and shoulder function in overhead athletes with shoulder impingement syndrome

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria:

Amateur male and female athletes in overhead sports (volleyball, basketball, handball, badminton, tennis) with shoulder impingement syndrome (Neer classification stage 1 and 2) The patient's chief complaint in the glenohumeral area or the proximal part of the arm for at least 4 weeks Positive at least 3 tests from Neer, Job, Hawkins, resisted external rotation and painful arch tests Shoulder pain with intensity between 3 and 7 based on VAS in one of the resistance tests of internal rotation, external rotation, flexion or abduction Absence of movement limitation of more than one third of the healthy side in raising the shoulder or at least a range of 150 degrees of elevation

Exclusion criteria:

Presence of neurological problems/pains originating from the cervical spine, systemic and rheumatological problems Receiving other treatments (such as corticosteroid injections) in at least one last month Adhesive capsulitis of the shoulder Type 3 Acromion The presence of grade 3 tears in the rotator cuff muscles Having a history of surgery, fracture, dislocation in the shoulder area in the last 12 months

Age

From **17 years** old to **45 years** old

Gender

Both

Phase

N/A

Groups that have been masked

- Participant

Sample size

Target sample size: **24**

Actual sample size reached: **24**

Randomization (investigator's opinion)

Randomized

Randomization description

In the first assessment session, the names of groups 1 (scapular stability exercises - control group) and 2 (scapular stability exercises with the addition of chain movement exercises - intervention group) are written on 12 sheets for each group and placed inside a sealed envelope. In this way, there will be 24 envelopes (12 envelopes containing the number 1 and 12 envelopes containing the number 2). Participants randomly pick one of the envelopes and give it to the therapist.

Blinding (investigator's opinion)

Double blinded

Blinding description

None of the referring people were aware of the existence of two treatment groups and the people were informed that during this research, the process of therapeutic exercise will be applied to them in order to reduce pain. The evaluation will be done by a person who does not know the contents of the envelopes and the grouping of patients.

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Research Ethics Committees of School of Nursing and Midwifery & Rehabilitation - Tehran University o

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No.12, Ghazavi Ave., Hoghughi St., Wooden Bridge

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Province

Tehran

Postal code

1611866814

Approval date

2023-07-18, 1402/04/27

Ethics committee reference number

IR.TUMS.FNM.RES.1402.099

Health conditions studied

1

Description of health condition studied

Impingement syndrome of shoulder

ICD-10 code

M75.4

ICD-10 code description

Impingement syndrome of shoulder

Primary outcomes

1

Description

"Pain intensity" using a visual analog scale

Timepoint

At the beginning of the study and after completing 12 training sessions

Method of measurement

Pain intensity will be evaluated using a visual analog scale at rest, in active abduction and flexion movements.

2

Description

Functional disability of the upper limb by the Persian version of Disabilities of the Arm, Shoulder and Hand questionnaire

Timepoint

At the beginning of the study and after completing 12 training sessions

Method of measurement

The score of the Persian version of the questionnaire related to the degree of disability of the shoulder (Disabilities of the Arm, Shoulder and Hand)

3

Description

Evaluation of the performance related to the upper limb closed movement chain by the average number of contacts in Closed Kinetic Chain Upper Extremity Stability Test

Timepoint

At the beginning of the study and after completing 12 training sessions

Method of measurement

Counting the average number of contacts in 15 seconds in Closed Kinetic Chain Upper Extremity Stability Test

4

Description

Evaluation of the performance of the closed movement chain in the upper limb by reaching distance in Upper Quarter Y-Balance Test in medial, superior-lateral and inferior-lateral directions

Timepoint

At the beginning of the study and after completing 12 training sessions

Method of measurement

Upper Quarter Y-Balance Test

5

Description

Upward/downward rotation angles of the scapula

Timepoint

At the beginning of the study and after completing 12 training sessions

Method of measurement

Gravity reference inclinometer

6

Description

Angle of Anterior/Posterior inclination of the scapula

Timepoint

At the beginning of the study and after completing 12 training sessions

Method of measurement

Gravity reference inclinometer

Secondary outcomes

1

Description

The distance between the inferior angle of the scapula and the spinous process of the closest adjacent vertebra, in three positions: in neutral position, at 40-45 degrees of shoulder abduction in the frontal plane and also at 90 degrees of shoulder abduction while the arm is in full internal rotation. .

Timepoint

At the beginning of the study and after the completion of 12 training sessions

Method of measurement

Using a tape measure in the Lateral Scapular Slide Test

Intervention groups

1

Description

Control group: performing 12 sessions of shoulder stabilization exercises as follows: Serratus anterior punch/Scapular retraction/Scapular retraction with adduction hold/Wall slide with Thera-band-at-wrist/D2-PNF pattern/Sleeper Stretch/Modified Cross body stretch/ Corner Stretch

Category

Rehabilitation

2

Description

Intervention group: performing 12 sessions of scapular stability exercises with the addition of movement chain components as follows: Forward Punch Plus with forward step/Fencing/Scapular retraction with adduction plus contralateral one leg squat/Wall slide with Thera-band-at-wrist plus squat /Reverse throw/Sleeper Stretch/Modified Cross body stretch/Corner Stretch

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Dayani Physiotherapy Clinic & Faculty of Rehabilitation, University of Tehran

Full name of responsible person

Seyede Sayeh Moosavi Chavoshi

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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Tehran University of Medical Sciences
Full name of responsible person
Vice President of Research and Technology of Tehran University of Medical Sciences
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Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Tehran University of Medical Sciences
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
Tehran University of Medical Sciences
Full name of responsible person
Seyede Sayeh Moosavi Chavoshi
Position
Master's Student
Latest degree
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Other areas of specialty/work
Physiotherapy
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Person responsible for updating data

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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
Undecided - It is not yet known if there will be 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
Not applicable
Data Dictionary
Not applicable
Title and more details about the data/document
The data of this study will be placed in the form of 24 separate participants, each of which has 30 variables. 15 of the variables are related to the first stage of evaluation and 15 are related to the second stage of evaluation, after the interventions.
When the data will become available and for how long
Access will be provided after printing the results
To whom data/document is available
People who are active in the field of physical therapy and sports and other aspiring researchers
Under which criteria data/document could be used
The use of data is unhindered by mentioning the source.
From where data/document is obtainable
email address: sayeh_moosavi183@yahoo.com
What processes are involved for a request to access data/document
email address: sayeh_moosavi183@yahoo.com
Comments