

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

10 Jun 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

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20240614062130N1**

Registration date: **2024-07-20, 1403/04/30**

Registration timing: **registered\_while\_recruiting**

Last update: **2024-07-20, 1403/04/30**

Update count: **0**

##### 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

empty

##### Actual recruitment end date

empty

**Trial completion date**

empty

**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**

**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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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

#### Street address

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

#### City

Tehran

#### Province

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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  
**Street address**  
No.12, Ghazavi Ave., Hoghugh St., Wooden Bridge  
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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**  
Bachelor  
**Other areas of specialty/work**  
Physiotherapy  
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## Person responsible for scientific inquiries

#### Contact

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## Person responsible for updating data

#### Contact

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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**