

Clinical Trial Protocol

Iranian Registry of Clinical Trials

20 Sep 2026

The effect of external rotation resistance training on post-competition shoulder girdle muscle fatigue in wrestlers: a randomized clinical trial.

Protocol summary

Study aim

Determining the effect of resistance rotational exercises on post-competition shoulder joint muscle fatigue in wrestlers

Design

A parallel-group, single-blind, randomized controlled clinical trial of 30 participants. The random permutation block method was used for randomization

Settings and conduct

Healthy amateur volunteer wrestlers are called from Semnan province. They are randomly placed in two intervention and control groups. Before and after the intervention and the wrestling competition, Fast Fourier transformation variables in the external rotator muscles of the shoulder and shoulder girdle at an angle of 30, 90 and 150 degrees of arm abduction in the scapular plane are evaluated.

Participants/Inclusion and exclusion criteria

Amateur wrestler Age range from 18 to 35 years
Middleweight category (70 to 90 kg)

Intervention groups

Control group: The training program includes specific wrestling exercises. Intervention group: In addition to the exercises performed by the control group, two resistance exercises for external rotator cuff muscles are also performed. In the first exercise, the subject contracts his hand with external and internal rotation of the shoulder (with emphasis on external rotation) in 3 angles of shoulder abduction against the therapist's force as Co-contraction. In the second exercise, the subject moves his hand outwards and the therapist applies a force perpendicular to the direction of the movement against the movement of the subject's hand at the end of the forearm. Each of the two exercises in 3 sets with descending repetitions 12, 10, and 8 are performed at 30, 90, and 150 degrees angle with one minute rest between sets and three minutes rest between two exercises.

Main outcome variables

average frequency; middle frequency; Crossing the zero line in electromyography

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20190108042292N5**

Registration date: **2023-01-19, 1401/10/29**

Registration timing: **prospective**

Last update: **2023-01-19, 1401/10/29**

Update count: **0**

Registration date

2023-01-19, 1401/10/29

Registrant information

Name

Cyrus Taghizadeh Delkhosh

Name of organization / entity

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2023-03-06, 1401/12/15

Expected recruitment end date

2023-09-06, 1402/06/15

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

The effect of external rotation resistance training on post-competition shoulder girdle muscle fatigue in wrestlers: a randomized clinical trial.

Public title

The effect of resistance training on shoulder fatigue of wrestlers

Purpose

Treatment

Inclusion/Exclusion criteria**Inclusion criteria:**

Amateur wrestler (a branch of wrestling that is held at university and non-professional levels) Age range from 18 to 35 years Middle weight category (70 to 90 kg)

Exclusion criteria:

History of soft tissue damage (joint dislocation and partial dislocation - stretching or tearing of ligaments, tendons and muscles, and joint capsule - joint inflammation and bursitis) and hard (fracture) in the shoulder and shoulder girdle History of soft and hard tissue damage in the neck History of soft and hard tissue damage in the chest Background of peripheral and central nervous system disease History of surgery in the neck, shoulder girdle, and chest History of drug use in the last two weeks Rehabilitation of the neck and shoulder girdle and chest in the last six months If from two weeks before the start of the study to the end of the study period, there is a serious sports competition and competition season

Age

From **18 years** old to **35 years** old

Gender

Both

Phase

N/A

Groups that have been masked

- Investigator

Sample size

Target sample size: **30**

Randomization (investigator's opinion)

Randomized

Randomization description

permuted block randomization

Blinding (investigator's opinion)

Single blinded

Blinding description

A physiotherapist will be in charge of the treatment process of the intervention group, and another physiotherapist will evaluate the desired variables. Therefore, the future study will be one-sided blind.

Placebo

Not used

Assignment

Parallel

Other design features**Secondary Ids**

empty

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

Ethics committee of Semnan University of Medical Sciences

Street address

Semnan University of Medical Sciences, Basij Blvd

City

Semnan

Province

Semnan

Postal code

3514799442

Approval date

2022-12-26, 1401/10/05

Ethics committee reference number

IR.SEMUMS.REC.1401.248

Health conditions studied**1****Description of health condition studied**

muscle fatigue

ICD-10 code

M70.81

ICD-10 code description

Other soft tissue disorders related to use, overuse and pressure of shoulder

Primary outcomes**1****Description**

Average frequency

Timepoint

Before and after the intervention, Before and after the wrestling match

Method of measurement

Electromyography

2**Description**

Mean Frequency

Timepoint

Before and after the intervention, Before and after the wrestling match

Method of measurement

Electromyography

3**Description**

Zero Crossing
Timepoint
Before and after the intervention, Before and after the wrestling match
Method of measurement
Electromyography

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: In addition to specific wrestling exercises including resistance, flexibility, plyometric, aerobic, and non-aerobic exercises, two resistance exercises are also performed to strengthen the external rotator cuff muscles for people in this group. In the first exercise, the subject contracts his hand with external and internal rotation of the shoulder (with emphasis on external rotation) in 3 shoulder abduction angles of 30, 90, and 150 against the therapist's force, which is applied to the end of the forearm, as a co-contraction. he does. In this exercise, which is the isometric type, the subject enters the therapist's hand against the direction and is equal to him, as a result of which the hand will be without any movement. Angles of 30, 90, and 150 degrees are performed with the help of the therapist's resistance. In this exercise, which is isotonic, the subject moves his hand outwards and the therapist applies a force perpendicular to the direction of the movement against the movement from the end of the forearm to the subject's hand. Each of the two exercises in 3 sets with Descending repetitions is done 12, 10, and 8 respectively at 30, 90, and 150-degree angles with one minute rest between sets and three minutes rest between two exercises.

Category

Rehabilitation

2

Description

Control group: The training program of this group includes specific exercises for wrestling, including resistance, flexibility, plyometric, aerobic and non-aerobic exercises.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Neuromuscular Rehabilitation Research Center of Semnan University of Medical Sciences

Full name of responsible person

Mohammad Reza Sharifi

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

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Full name of responsible person

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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

Semnan 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

Semnan University of Medical Sciences

Full name of responsible person

AHmad Rrza Sharifi

Position

Student

Latest degree

Bachelor

Other areas of specialty/work

Rehabilitation management

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Associate professor

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Sharing plan**Deidentified Individual Participant Data Set (IPD)**

No - There is not a plan to make this available

Justification/reason for indecision/not sharing IPD

There is no more information

Study Protocol

No - There is not a plan to make this available

Statistical Analysis Plan

No - There is not a plan to make this available

Informed Consent Form

No - There is not a plan to make this available

Clinical Study Report

No - There is not a plan to make this available

Analytic Code

No - There is not a plan to make this available

Data Dictionary

No - There is not a plan to make this available