

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

10 Jun 2026

### Immediate effect of soft tissue mobilization tool (Graston), static hold-relax, and muscle energy techniques on hamstring muscle shortness in healthy athletes: Randomized clinical trial

#### Protocol summary

##### Study aim

The aim of the present study was to compare the three methods of muscle energy technique, hold-relax, and soft tissue release tool on increasing hamstring muscle length in healthy athletes.

##### Design

A clinical trial with three treatment groups, with parallel, randomized groups, on 60 patients.

Www.randomization.com was used for randomization.

##### Settings and conduct

Location: Physiotherapy Clinic of Ghaem Hospital

Blinding: Assessors, analysis, Allocation

##### Participants/Inclusion and exclusion criteria

Inclusion criteria: Healthy athletes aged 18-50 years, Passive Straight Leg Raising Test should be 70 degrees or less (the lumbar spine arch will be maintained by the roll to prevent posterior pelvic tilt during the test

Exclusion criteria: Skin infections, Symptoms of lumbar disc herniation and neurological symptoms. Skin allergies,

##### Intervention groups

Soft tissue release tool: The shorter areas of the muscle are Gerston Instrument 4 (GT4) and finally one minute of very short strokes in small points by Greston Instrument 3 (GT3). In hold-relax group, the patients perform the usual warm-up ten minutes before exercise. The hold-relax technique will be performed. The MET group, who will receive the muscle energy technique. In this group, the patient performs the usual pre-workout warm-up for ten minutes, followed by muscle energy technique. T

##### Main outcome variables

Active Knee Extension Test score, Toe Touch Test score, Passive Straight Leg Raising Test score Tests will be measured before and immediately after the intervention.

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20161221031506N6**

Registration date: **2021-08-06, 1400/05/15**

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

Last update: **2021-08-06, 1400/05/15**

Update count: **0**

##### Registration date

2021-08-06, 1400/05/15

##### Registrant information

##### Name

Salman Nazary-Moghadam

##### Name of organization / entity

##### Country

Iran (Islamic Republic of)

##### Phone

+98 51 3884 6713

##### Email address

nazaryms@mums.ac.ir

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2021-07-08, 1400/04/17

##### Expected recruitment end date

2021-08-23, 1400/06/01

##### Actual recruitment start date

empty

##### Actual recruitment end date

empty

##### Trial completion date

empty

## Scientific title

Immediate effect of soft tissue mobilization tool (Graston), static hold-relax, and muscle energy techniques on hamstring muscle shortness in healthy athletes: Randomized clinical trial

## Public title

The effect of physiotherapy techniques on hamstring muscle shortness

## Purpose

Prevention

## Inclusion/Exclusion criteria

### Inclusion criteria:

Healthy athletes aged 18-50 years Passive Straight Leg Raising Test should be 70 degrees or less (the lumbar spine arch will be maintained by the roll to prevent posterior pelvic tilt during the test

### Exclusion criteria:

Skin infections Symptoms of lumbar disc herniation and neurological symptoms Skin allergies No injuries or surgery on the hip and knee joint in the last 6 months No damage to the hamstring muscle in the last 2 months

## Age

From **18 years** old to **50 years** old

## Gender

Both

## Phase

N/A

## Groups that have been masked

- Investigator
- Outcome assessor
- Data analyser

## Sample size

Target sample size: **60**

## Randomization (investigator's opinion)

Randomized

## Randomization description

The randomization method will be the block method. The envelope method is that the envelopes are prepared and printed by a member of the research team random numbers with the help of Randomization.com site and placed inside the envelope Will take. The lid of the envelope will be closed and its contents will not be visible from the outside. Then, the purpose of the study is first explained to the person who meets the conditions, and the person, if desired, signs the informed consent form and takes an envelope, and then opens it and enters the intervention or control groups based on the contents of the envelope. . Allocation Concealment: Sealed envelopes

## Blinding (investigator's opinion)

Double blinded

## Blinding description

Blinding in allocation will be done using numeric codes. The secretary of the physiotherapy department of Ghaem Hospital in Mashhad will take the sheet out of the envelope and give it to the researcher. Based on the code, the researcher will assign the participant to the desired group. Also, the evaluator will only provide the result of the tests to the researcher, ساس does not know about the grouping codes. The names of the groups in

spss software will be written by code. The statistical analyzer will be blinded about grouping codes.

## Placebo

Not used

## Assignment

Parallel

## Other design features

None declared.

## Secondary Ids

empty

## Ethics committees

### 1

#### Ethics committee

##### Name of ethics committee

The Ethics Committee of Mashhad University of Medical Sciences

##### Street address

Opposite University Street 18, University street

##### City

Mashhad

##### Province

Razavi Khorasan

##### Postal code

9138813944

#### Approval date

2021-07-07, 1400/04/16

#### Ethics committee reference number

IR.MUMS.FHMPM.REC.1400.034

## Health conditions studied

### 1

#### Description of health condition studied

Hamstring muscle shortness

#### ICD-10 code

M63.8

#### ICD-10 code description

Disorders of muscle in diseases classified elsewhere

## Primary outcomes

### 1

#### Description

Active Knee Extension Test

#### Timepoint

Before and immediately after treatment

#### Method of measurement

Active Knee Extension Test

### 2

#### Description

Passive Straight Leg Raising test score measured by The value of the angle.

#### Timepoint

Before and immediately after treatment

#### **Method of measurement**

Passive Straight Leg Raising Test

### **3**

#### **Description**

Toe Touch Test score

#### **Timepoint**

Before and immediately after treatment

#### **Method of measurement**

Toe Touch Test

## **Secondary outcomes**

empty

## **Intervention groups**

### **1**

#### **Description**

Intervention group: increasing hamstring muscle length using Hold Relax The patient performs the usual warm-up ten minutes before exercise. The hold-relax technique will be performed. The patient is in the supine position and the hip joint is in a 90 degree flexion position. The therapist will hold the patient's knee for 7 seconds until the person reports a slight feeling of tightness in their hamstring muscle. The patient is then asked to hold his or her knee (by pushing the foot toward the bed against the therapist's resistance) 80-90% maximal voluntary contraction for 7 seconds. It is important to note that no movement should be performed on the patient's knee and that a completely isometric contraction should be performed by the hamstring muscle. After the contraction, the patient relaxes the muscle for 5 seconds and is taken to a new range. The process will be repeated three times. The patient should not report any pain during the entire technique. This technique will be done in one session only.

#### **Category**

Rehabilitation

### **2**

#### **Description**

Intervention group: increasing hamstring muscle length using muscle energy technique. In this group, the patient performs the usual pre-workout warm-ups for ten minutes, followed by MET. The patient will be supine on the bed and the hip joint will be in a 90 degree flexion position. The therapist holds the patient's knee until the person reports a slight stretch in their hamstring muscle. The patient is then asked to maintain his or her knee at 15-20% of maximum voluntary contraction (by pushing the foot toward the bed against the therapist's resistance) for 7 seconds. It is important to note that no movement should be performed on the patient's knee and a completely isometric contraction will be performed by the hamstring muscle. After the contraction, the patient relaxes the muscle for 5 seconds and is taken to a new range. The process is repeated. The patient should

not report any pain during the entire technique. The therapist repeats this process 3 times. This technique will be done in one session only.

#### **Category**

Rehabilitation

### **3**

#### **Description**

Intervention group: increasing hamstring muscle length using soft tissue mobilization tool (Graston). The shorter areas of the muscle are Graston Instrument 4 (GT4) and finally one minute of very short strokes in small points by Graston Instrument 3 (GT3). This process will continue for 10 minutes. This technique will be done in one session only.

#### **Category**

Rehabilitation

## **Recruitment centers**

### **1**

#### **Recruitment center**

##### **Name of recruitment center**

Physical Therapy Clinic of Ghaem Hospital

##### **Full name of responsible person**

Mr Javad Zarandi

##### **Street address**

Nursing door entrance, right side, library side, Narjes building, first floor,Physiotherapy Department, Ghaem Hospital,

##### **City**

Mashhad

##### **Province**

Razavi Khorasan

##### **Postal code**

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##### **Email**

ZarandiMJ1@mums.ac.ir

##### **Web page address**

<https://quaem.mums.ac.ir>

## **Sponsors / Funding sources**

### **1**

#### **Sponsor**

##### **Name of organization / entity**

Mashhad University of Medical Sciences

##### **Full name of responsible person**

Dr. Mohsen Tafaghodi

##### **Street address**

Doctora Cross road, Ghoreshi Building

##### **City**

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##### **Province**

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**Web page address**  
<http://v-research.mums.ac.ir/>

**Grant name**  
Dr. Mohsen Tafaghodi

**Grant code / Reference number**  
4000054

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

**Title of funding source**  
Mashhad 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**  
Mashhad University of Medical Sciences

**Full name of responsible person**  
Afrooz Yahya zadeh

**Position**  
MSC Student

**Latest degree**  
Bachelor

**Other areas of specialty/work**  
Physiotherapy

**Street address**  
Mashhad- Azadi Square- East door of Ferdowsi  
University of Mashhad- University campus- Faculty of  
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## Person responsible for scientific inquiries

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**Position**  
Assistant professor

**Latest degree**  
Ph.D.

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## Person responsible for updating data

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afruzyayapt1371@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

Yes - There is 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

All data is potentially shareable after un-identification of individuals

### When the data will become available and for how long

Jan 2022

### To whom data/document is available

It will be available only to researchers working in academic and scientific institutions.

### Under which criteria data/document could be used

The data will be delivered to the applicants only for meta-analysis.

### From where data/document is obtainable

Salman Nazary-Moghadam Nazaryms@mums.ac.ir

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

After mailing, the request will be considered after two weeks, and the data will be delivered to the applicant.

### Comments

No comments.