Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 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
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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, ساث 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 Gerston Instrument 4 (GT4) and finally one minute of very short strokes in small points by Greston 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,

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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

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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
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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
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.