

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

10 Jun 2026

### Effects of adding massage gun before or after dry needling versus dry needling alone on hamstring flexibility, strength and performance, and post-needling soreness in male amateur bodybuilders with hamstring shortness

#### Protocol summary

##### Study aim

to investigate the effect of adding percussive massage before or after dry needling and comparing it with dry needling alone on hamstring muscle flexibility, strength, and function, and needle-induced discomfort in a group of male amateur bodybuilders with hamstring muscle shortening

##### Design

three groups: dry needling intervention alone with 5 mins of rest, dry needling intervention group with 5 mins of percussion massage afterwards, and dry needling intervention group with 5 mins of percussion massage before it Single-blinded 36 people Block randomization

##### Settings and conduct

In the Boys' Medical Sciences Dormitory, A physiotherapist, who is unaware of group allocation, will record participant characteristics and measure study variables before the intervention, immediately after the intervention, and 24 hours after the intervention Another physiotherapist will administer the interventions.

##### Participants/Inclusion and exclusion criteria

Inclusion criteria Male amateur bodybuilders 18-40 years Short hamstring Exclusion criteria Use of nonsteroidal anti-inflammatory drugs contraindications for dry needling contraindications for percussive massage Low back pain or radicular pain within the past 3 months History of back, hip, or knee surgery Hamstring strain within the past 3 months History of musculoskeletal diseases in the lower extremities Unwillingness to participate in the study

##### Intervention groups

dry needling intervention needles are inserted into 3 locations of the hamstrings for 1 minute in a single session, using a fast in-out cone-shaped technique percussion massage intervention massage is applied to the hamstring muscle for 5 minutes with a massage

device

##### Main outcome variables

Hamstring muscle length Hamstring stretch tolerance angle Hamstring strength in isometric contraction Hamstring to quadriceps contraction ratio Triple hop test Needle irritation Pressure pain threshold

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20250313065062N1**  
Registration date: **2025-05-05, 1404/02/15**  
Registration timing: **registered\_while\_recruiting**

Last update: **2025-05-05, 1404/02/15**

Update count: **0**

##### Registration date

2025-05-05, 1404/02/15

##### Registrant information

##### Name

Mohsen Ghoorchibeigi

##### Name of organization / entity

##### Country

Iran (Islamic Republic of)

##### Phone

+98 21 8835 2176

##### Email address

m-ghoorchibegi@razi.tums.ac.ir

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2025-05-05, 1404/02/15  
**Expected recruitment end date**  
2025-08-06, 1404/05/15  
**Actual recruitment start date**  
empty  
**Actual recruitment end date**  
empty  
**Trial completion date**  
empty

**Scientific title**  
Effects of adding massage gun before or after dry needling versus dry needling alone on hamstring flexibility, strength and performance, and post-needling soreness in male amateur bodybuilders with hamstring shortness

**Public title**  
Effects of adding massage gun before or after dry needling versus dry needling alone on hamstring flexibility, strength and performance, and post-needling soreness in male amateur bodybuilders with hamstring shortness

**Purpose**  
Treatment

**Inclusion/Exclusion criteria**  
**Inclusion criteria:**

Male amateur bodybuilders with at least three two-hour training sessions per week Age range 18 to 40 years Hamstring shortening  $\geq 20$  degrees in the dominant leg, determined by active knee extension testing Body mass index (BMI) between 18.5 and 29.9 kg/m<sup>2</sup>

**Exclusion criteria:**  
Use of nonsteroidal anti-inflammatory drugs, analgesics, or muscle relaxants during the study period Having any contraindications for dry needling, including, medical emergency or acute medical condition, local infection, lymphedema, coagulation disorders such as hemophilia, epilepsy, metal sensitivity (dry needling) Having any contraindications for percussive massage, including varicose veins, broken bones, areas with blood clots Back pain or radicular pain within the past 3 months History of back, hip, or knee surgery within the past year of hamstring strain within the past 3 months History of orthopedic or neurological diseases in the lower extremities

**Age**  
From **18 years** old to **40 years** old

**Gender**  
Male

**Phase**  
N/A

**Groups that have been masked**  

- Outcome assessor

**Sample size**  
Target sample size: **36**

**Randomization (investigator's opinion)**  
Randomized

**Randomization description**  
Randomization will be performed using Block  
Randomization and allocation concealment will be done

using sequentially numbered, opaque, sealed envelopes. This method is one of the common methods of concealing random allocation, which is known as the SNOSE method for short. The random allocation process will be performed by someone outside the research team before the study begins. Finally, each individual's study group assignment will be determined according to the contents of the envelope provided to them. Accordingly, individuals will be divided into three groups: dry needling alone, dry needling with percussion massage before, and dry needling with percussion massage after.

**Blinding (investigator's opinion)**  
Single blinded

**Blinding description**  
A trained physiotherapist, blinded to group allocation, recorded participant characteristics including age, weight, and height and measured study variables before, immediately after, and 24 hours after the intervention. Another experienced physiotherapist performed the interventions on the dominant leg of the individual with hamstring shortening.

**Placebo**  
Not used

**Assignment**  
Parallel

**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

#### Ethics committee

##### Name of ethics committee

Ethics Committee of the Faculty of Nursing and Midwifery and the Faculty of Rehabilitation - Tehran

##### Street address

Shahrak Qods (West), between South Flamack and Zarafshan, Simay Iran Street - Central Headquarters of the Ministry of Health, Treatment and Medical Education, Block A, 13th Floor

##### City

Tehran

##### Province

Tehran

##### Postal code

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#### Approval date

2025-03-11, 1403/12/21

#### Ethics committee reference number

IR.TUMS.FNM.REC.1403.199

## Health conditions studied

### 1

#### Description of health condition studied

hamstring shortness

#### ICD-10 code

## ICD-10 code description

## Primary outcomes

### 1

#### Description

Hamstring muscle flexibility

#### Timepoint

Before the intervention, immediately after the intervention, and 24 hours after the intervention

#### Method of measurement

With goniometer in active knee extension test 90/90

### 2

#### Description

Hamstring stretch tolerance angle degree

#### Timepoint

Before the intervention, immediately after the intervention, and 24 hours after the intervention

#### Method of measurement

With goniometer in active knee extension test 90/90

### 3

#### Description

Maximum hamstring strength in isometric contraction at 45 and 60 degree knee angles

#### Timepoint

Before the intervention, immediately after the intervention, and 24 hours after the intervention

#### Method of measurement

Dynamometer

### 4

#### Description

Hamstring to quadriceps contraction ratio at 45 and 60 degree knee angles

#### Timepoint

Before the intervention, immediately after the intervention, and 24 hours after the intervention

#### Method of measurement

Dynamometer and ratio formula

### 5

#### Description

Performance

#### Timepoint

Before the intervention, immediately after the intervention, and 24 hours after the intervention

#### Method of measurement

Triple hop test

### 6

#### Description

Dry needling soreness

#### Timepoint

Before the intervention, immediately after the intervention, and 24 hours after the intervention

## Method of measurement

Numerical pain rating scale

### 7

#### Description

Pressure pain threshold

#### Timepoint

Before the intervention, immediately after the intervention, and 24 hours after the intervention

#### Method of measurement

Algometer

## Secondary outcomes

empty

## Intervention groups

### 1

#### Description

Control group: Dry needling . A physiotherapist will use sterile disposable needles (Eacu brand, Korea) for dry needling, using hygienic measures such as wearing gloves and using alcohol to disinfect the site and gloves, and then the used needles will be placed in the Safety Box. During a session, participants will be needled at three points on the hamstrings for 1 minute using the fast in-out cone-shaped technique in the prone position. Two points on the short and long heads of the biceps femoris muscle will be needled at 60% and 30% of the distance from the ischial tuberosity to the fibular head, respectively. The third point targets the semimembranosus and semitendinosus muscles at 60% of the distance from the ischial tuberosity to the medial femoral epicondyle.

#### Category

Rehabilitation

### 2

#### Description

Intervention group 1: Dry needling followed by percussion massage intervention, percussion massage intervention: Percussion massage is applied to the hamstring muscle for 5 minutes with a Booster Lightstaber (china) massage device at a speed of 3200 revolutions per minute (rpm) equivalent to a frequency of 53 Hz with a "hard ball" head. The semimembranosus and semitendinosus muscles are massaged in the first 2.5 minutes of massage and the biceps femoris muscle in the second 2.5 minutes. In the first 2.5 minutes, the massage begins from the inner side of the muscle, focusing on applying equal pressure throughout the massage. The massage is performed by moving the device from distal to proximal and from proximal to distal in a straight line for 20 seconds. In the last 2.5 minutes, the massage device is moved outward at the distal end of the muscle and the application is performed from distal to proximal and then distal. In this way, the massage for each muscle starts from the inside and ends on the outside.

## Category

Rehabilitation

## 3

### Description

Intervention group 2: Dry needling and before that, percussion massage intervention, percussion massage intervention: Percussion massage is applied to the hamstring muscle for 5 minutes with a Booster Lightstaber (china) massage device at a speed of 3200 revolutions per minute (rpm) equivalent to a frequency of 53 Hz with a "hard ball" head. The semimembranosus and semitendinosus muscles are massaged in the first 2.5 minutes of massage and the biceps femoris muscle in the second 2.5 minutes. In the first 2.5 minutes, the massage begins from the inner side of the muscle, focusing on applying equal pressure throughout the massage. The massage is performed by moving the device from distal to proximal and from proximal to distal in a straight line for 20 seconds. In the last 2.5 minutes, the massage device is moved outward at the distal end of the muscle and the application is performed from distal to proximal and then distal. In this way, the massage for each muscle starts from the inside and ends on the outside.

## Category

Rehabilitation

## Recruitment centers

## 1

### Recruitment center

#### Name of recruitment center

Faculty of Rehabilitation, University of Tehran

#### Full name of responsible person

Dr. Kazem Malmir

#### Street address

Enghelab St., Pich shemiran , Corner of Safi Alishah St., Faculty of Rehabilitation

#### City

Tehran

#### Province

Tehran

#### Postal code

1148965111

#### Phone

+98 21 7753 3939

#### Email

rehabilitation@tums.ac.ir

## Sponsors / Funding sources

## 1

### Sponsor

#### Name of organization / entity

Tehran University of Medical Sciences

#### Full name of responsible person

Dr. Ramin Kordi

#### Street address

Keshavarz Blvd., Corner of Qods, Headquarters of Tehran University of Medical Sciences

#### City

Tehran

#### Province

Tehran

#### Postal code

1936893813

#### Phone

+98 21 81631

#### Fax

#### Email

tumspr@tums.ac.ir

#### 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

Mohsen Ghoorchibeigi

#### Position

Student

#### Latest degree

Bachelor

#### Other areas of specialty/work

Physiotherapy

#### Street address

Tehran medical University dormitory for men , affront of 16th Street of kargar shomali , amirabad

#### City

Tehran

#### Province

Tehran

#### Postal code

1439955975

#### Phone

+98 21 8835 2176

#### Fax

#### Email

mohsenghoorchibeigi@gmail.com

## Person responsible for scientific inquiries

### Contact

**Name of organization / entity**

Tehran University of Medical Sciences

**Full name of responsible person**

Dr. Kazem Malmir

**Position**

Associate professor

**Latest degree**

Ph.D.

**Other areas of specialty/work**

Physiotherapy

**Street address**

Enghelab St., Pich shemiran , Corner of Safi Alishah St., Faculty of Rehabilitation

**City**

Tehran

**Province**

Tehran

**Postal code**

1148965111

**Phone**

+98 21 7753 3939

**Email**

kmalmir@tums.ac.ir

## Person responsible for updating data

### Contact

**Name of organization / entity**

Tehran University of Medical Sciences

**Full name of responsible person**

Mohsen Ghoorchibeigi

**Position**

Student

**Latest degree**

Bachelor

**Other areas of specialty/work**

Physiotherapy

**Street address**

Tehran medical University dormitory for men , affront of 16th Street of kargar shomali , amirabad

**City**

Tehran

**Province**

Tehran

**Postal code**

1439955975

**Phone**

+98 21 8835 2176

**Fax****Email**

mohsenghoorchibeigi@gmail.com

## Sharing plan

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

Undecided - It is not yet known if there will be a plan to make this available

**Study Protocol**

Undecided - It is not yet known if there will be 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**

Undecided - It is not yet known if there will be a plan to make this available

**Clinical Study Report**

Undecided - It is not yet known if there will be a plan to make this available

**Analytic Code**

Not applicable

**Data Dictionary**

Not applicable