

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

10 Jun 2026

**The comparison of immediate effects of Whole body vibration and muscle energy technique on hamstring muscle flexibility and stiffness in healthy young females.**

### Protocol summary

#### Study aim

Determination of acute effect of Whole Body vibration(WBV) and Muscle Energy technique(MET) on hamstring flexibility and stiffness

#### Design

The present study was a Randomized clinical trial. Randomization was done using balanced block randomization method. Fifty six patients were enrolled through two parallel groups

#### Settings and conduct

The study was carried out at the Biomechanics Laboratory of Tehran University of Medical Sciences. At first, participants were evaluated with Active Knee Extension test, Modified Sit & Reach test and Stiffness measuring. Then they were randomly assigned to one of the treatment groups. After the intervention, they did the same pre-treatment assessment again.

#### Participants/Inclusion and exclusion criteria

Inclusion criteria: Women aged between 18-30 years old; BMI between 18.5-29.5; 20 degree or more extension lack during active knee extension; Satisfaction with participation in the project. Non inclusion criteria: Cardiovascular, Respiratory, Neurology and Musculo-skeletal diseases; using lower extremity prosthesis; pregnancy; severe deformity of lower extremity

#### Intervention groups

Intervention group 1 (Muscle Energy Technique): In the MET group, the isometric contraction of the hamstring muscle in 3 parts and the transfer of the knee to the greater range of motion are used to increase flexibility and reduce stiffness. Intervention group 2 (Whole Body Vibration): In the WBV group, vibration by platform with 3 HZ frequency and 2mm amplitude is used to increase flexibility and reduce stiffness.

#### Main outcome variables

Hamstring proximal head flexibility; Hamstring distal head flexibility; Stiffness

### General information

#### Reason for update

#### Acronym

#### IRCT registration information

IRCT registration number: **IRCT20180926041140N1**

Registration date: **2018-11-11, 1397/08/20**

Registration timing: **retrospective**

Last update: **2018-11-11, 1397/08/20**

Update count: **0**

#### Registration date

2018-11-11, 1397/08/20

#### Registrant information

##### Name

Maryam Azizi

##### Name of organization / entity

##### Country

Iran (Islamic Republic of)

##### Phone

+98 21 7752 8468

##### Email address

pt\_maryamazizi@yahoo.com

#### Recruitment status

**Recruitment complete**

#### Funding source

#### Expected recruitment start date

2018-06-30, 1397/04/09

#### Expected recruitment end date

2018-10-29, 1397/08/07

#### Actual recruitment start date

empty

#### Actual recruitment end date

empty

#### Trial completion date

empty

## Scientific title

The comparison of immediate effects of Whole body vibration and muscle energy technique on hamstring muscle flexibility and stiffness in healthy young females.

## Public title

The comparison of WBV and MET on flexibility and stiffness

## Purpose

Treatment

## Inclusion/Exclusion criteria

### Inclusion criteria:

Age between 18-30 years old 20 degree or more extension lack during active knee extension BMI between 18.5 to 29.5 Satisfaction with participation in the project

### Exclusion criteria:

Participation in sport activities 3 days or more in a week Severe deformities in the back, hip, knee and ankle Lower extremity prosthesis Chronic musculo-skeletal disorders Pregnancy Neurological and Vestibular disorders Cardiovascular and Respiratory disorders History of Epilepsy, Seizure and Migraine History of hamstring strain

## Age

From **18 years** old to **30 years** old

## Gender

Female

## Phase

N/A

## Groups that have been masked

*No information*

## Sample size

Target sample size: **56**

## Randomization (investigator's opinion)

Randomized

## Randomization description

Randomization was performed using a Balanced Block method, in which we designed four blocks of available probabilities, so that in each block, two were from the MET group and two from the WBV group, and the number of possible probabilities was 6. Then, using Excel we created a list of numbers from 1 to 6 and arranged the blocks according to the list of numbers.

## Blinding (investigator's opinion)

Not blinded

## Blinding description

## Placebo

Not used

## Assignment

Parallel

## Other design features

## Secondary Ids

empty

## Ethics committees

### 1

#### Ethics committee

Name of ethics committee

Ethics committee on biomedical research of Tehran University of Medical Sciences

## Street address

Headquarters of the Ministry of Health and Medical Education, Simaye Iran st, Qods township

## City

Tehran

## Province

Tehran

## Postal code

1148956111

## Approval date

2018-06-20, 1397/03/30

## Ethics committee reference number

IR.TUMS.VCR.REC.1397.194

## Health conditions studied

### 1

#### Description of health condition studied

Hamstring tightness

#### ICD-10 code

#### ICD-10 code description

## Primary outcomes

### 1

#### Description

Flexibility of hamstring distal head

#### Timepoint

Before and immediately after intervention

#### Method of measurement

Goniometer

### 2

#### Description

Flexibility of hamstring proximal head

#### Timepoint

Before and immediately after intervention

#### Method of measurement

Flex tester box

### 3

#### Description

Hamstring stiffness

#### Timepoint

Before and immediately after intervention

#### Method of measurement

Biodex system 3

## Secondary outcomes

empty

## Intervention groups

## 1

### Description

Intervention group: Muscle energy technique, controlled isometric contraction from the target muscle and then transfer the knee to the greater extension range

### Category

Rehabilitation

## 2

### Description

Intervention group: Whole body vibration, vibrations with a frequency of 30 Hz and amplitude of 2 mm are applied through the platform to the whole body.

### Category

Rehabilitation

## Recruitment centers

## 1

### Recruitment center

#### Name of recruitment center

Biomechanic laboratory of rehabilitation faculty,  
Tehran University of Medical Sciences

#### Full name of responsible person

Maryam Azizi

#### Street address

At the corner of Safi Alishah street, Enqelab-Eslami  
street

#### City

Tehran

#### Province

Tehran

#### Postal code

1148956111

#### Phone

+98 21 7753 5132

#### Email

pt\_maryamazizi@yahoo.com

## Sponsors / Funding sources

## 1

### Sponsor

#### Name of organization / entity

Tehran University of Medical Sciences

#### Full name of responsible person

Seyyed Mohsen Mir

#### Street address

Rehabilitation faculty, At the corner of Safi Alishah  
street, Enqelab-Eslami street

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#### Phone

+98 21 7753 5132

### Email

Rehabilitation@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

Maryam Azizi

#### Position

Student

#### Latest degree

Bachelor

#### Other areas of specialty/work

Physiotherapy

#### Street address

Rehabilitation faculty, At the corner of Safi Alishah  
street, Enqelab-Eslami street

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## Person responsible for scientific inquiries

### Contact

#### Name of organization / entity

Tehran University of Medical Sciences

#### Full name of responsible person

Maryam Azizi

#### Position

Student

#### Latest degree

Bachelor

#### Other areas of specialty/work

Physiotherapy

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**Person responsible for updating data****Contact****Name of organization / entity**

Tehran University of Medical Sciences

**Full name of responsible person**

Maryam Azizi

**Position**

Student

**Latest degree**

Bachelor

**Other areas of specialty/work**

Physiotherapy

**Street address**

Rehabilitation faculty of Tehran University of Medical

**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**

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