Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 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 flexibilit 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 extention; 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
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At the corner of Safi Alishah street, Enqelab-Eslami street
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
Tehran University of Medical Sciences
Full name of responsible person
Seyyed Mohsen Mir
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Rehabilitation faculty, At the corner of Safi Alishah street, Enqelab-Eslami street
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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
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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
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