

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

10 Jun 2026

### Immediate effect of Mulligan 's bent leg raise versus active release technique on hamstring tightness in asymptomatic individuals

#### Protocol summary

##### Study aim

To evaluate the immediate effects of Mulligan's Bent leg raise and active release technique on tightness of hamstring in asymptomatic individuals for range of motion and flexibility

##### Design

A concealed ,randomized, double blinded clinical trial of 26 participants enrolled in April 2023

##### Settings and conduct

Setting of the study is MADINA TEACHING HOSPITAL, FAISALABAD The study population is 26 individuals. Double blinding is used for participant selection with sealed envelopes for choosing the intervention groups by lottery method and the data analyzer is also blinded. Participants in a randomized clinical trial can be blinded by not knowing which treatment group they are assigned to. The data analyzer can be blinded by not knowing which treatment group each participant belongs to. This helps reduce bias in analyzing the results. Participants of the study are asymptomatic individuals

##### Participants/Inclusion and exclusion criteria

Inclusion criteria: Straight leg raise range of motion less than 75°; both male and female participants; Between age 18 to 30 years; Who are willing to participate; Tightness of hamstring measured by Active knee extension test; Normal healthy subjects. Exclusion criteria: Recent Trauma; Spinal Surgery; Fractures; Osteoporosis; low back pain; Orthopedic disease effecting lower limb (meniscal injury, femoral fracture etc.)

##### Intervention groups

The Intervention group 1 received Mulligan 's bent leg raise technique. Intervention group 2 received Active Release Technique

##### Main outcome variables

Straight Leg Raise range of motion Active Knee Extension Test Sit and Reach Flexibility Test

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20230413057901N1**

Registration date: **2023-09-20, 1402/06/29**

Registration timing: **retrospective**

Last update: **2023-09-20, 1402/06/29**

Update count: **0**

##### Registration date

2023-09-20, 1402/06/29

##### Registrant information

##### Name

Anum Toheed

##### Name of organization / entity

The University Of Faisalabad

##### Country

Pakistan

##### Phone

+92 308 6634924

##### Email address

dr.toheed112@gmail.com

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2023-04-10, 1402/01/21

##### Expected recruitment end date

2023-06-11, 1402/03/21

##### Actual recruitment start date

empty

##### Actual recruitment end date

empty

##### Trial completion date

empty

## Scientific title

Immediate effect of Mulligan 's bent leg raise versus active release technique on hamstring tightness in asymptomatic individuals

## Public title

Hamstring touching

## Purpose

Treatment

## Inclusion/Exclusion criteria

### Inclusion criteria:

Straight leg raise range of motion less than 75° Both male and female participants Age range of 18 to 40 years Willingness to participate in the study Tightness of hamstring measured by Active knee extension test with angle of popliteal less than 70 ° Normal healthy Subjects

### Exclusion criteria:

Recent fractures Neurological disorders Recent trauma Spinal Surgery Osteoporosis Low back pain Orthopedic disease affecting lower limb (meniscal injury, femoral fracture etc.)

## Age

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

## Gender

Both

## Phase

N/A

## Groups that have been masked

- Participant
- Data analyser

## Sample size

Target sample size: **26**

## Randomization (investigator's opinion)

Randomized

## Randomization description

Randomization is done through sealed envelopes; a simple random method is used by means of the Lottery method; concealment of allocation is also done.

## Blinding (investigator's opinion)

Double blinded

## Blinding description

Participants and data analyzer are blinded. Subjects are unaware of their assigned groups (treatment) due to identical presentation of treatment. In investigator-initiated trials, the patient is not involved in treatment allocation discussions with participants. Care providers are blinded to subjects treatment ensuring unbiased care delivery. Those collecting data are uninformed about treatment allocation, maintaining objective data gathering. Data safety and monitoring board 's access to treatment information is limited, focusing on safety.

## Placebo

Not used

## Assignment

Parallel

## Other design features

Academic

## Secondary Ids

empty

## Ethics committees

### 1

#### Ethics committee

##### Name of ethics committee

Prof dr Aliya Fehmi

##### Street address

Street no 3

##### City

Faisalabad

##### Postal code

38000

#### Approval date

2023-01-08, 1401/10/18

#### Ethics committee reference number

TUF/Addl Reg/SB/351

## Health conditions studied

### 1

#### Description of health condition studied

Hamstring tightness

#### ICD-10 code

M62. 461

#### ICD-10 code description

other muscle spasm

## Primary outcomes

### 1

#### Description

Active knee Extension Test score

#### Timepoint

Before intervention and immediately after the intervention

#### Method of measurement

Active knee Extension Test

## Secondary outcomes

### 1

#### Description

Sit and reach flexibility test

#### Timepoint

Before intervention and after immediate application of intervention

#### Method of measurement

range of motion of extension of hip for hamstring flexibility

### 2

#### Description

Straight leg raise

#### Timepoint

Before intervention and after immediate application of intervention

## Method of measurement

range of motion of hip extension

## Intervention groups

### 1

#### Description

Intervention group 1: Mulligan's BLR: Subjects in this group undergo a single session of this exercise on their dominant side. Participant's Position is lying on their backs at the plinth's edge with knee and hip at 90° heel coming off the plinth and flexion. Walk while adopting the affected side's stance. The inner hand's shoulder is positioned beneath the popliteal fossa. With both hands, the therapist holds the lower portion of the thigh. The femur's long axis is subjected to longitudinal traction, and the therapist bends the hip until they feel resistance. The contract-relax technique is used when a patient complains of stretch pain or the therapist experiences resistance because of tight muscles. The participant is requested to gently push the therapist's shoulder (hold for five seconds) If there is no pain, the therapist can now further flex the patient's hip. Before adding more hip flexion, the hip can be moved into abduction, external rotation, or extra traction if patients report pain during this technique. Remain in the final position for roughly 20 seconds. Perform the procedure three more times and then evaluate the results of the mobilization

#### Category

Treatment - Other

### 2

#### Description

Intervention group 2: Active Release Group : Active Release Technique (ART) was applied to subjects once on the dominant side. The ART procedure consists of 3 phases. • The subject was asked to lay supine on the plinth, and the hamstring muscle was gently pulled throughout its whole length as the leg was stretched in various postures to better train the muscle • At the insertion and origin of the hamstring muscle, light stress was applied • Since the hamstring connects to the adductors and gluteus muscle, which may be the cause of hamstring tightness, gentle stress was applied around these muscles

#### Category

Treatment - Other

## Recruitment centers

### 1

#### Recruitment center

##### Name of recruitment center

The University of Faisalabad

##### Full name of responsible person

Dr Mariam Mahmood

##### Street address

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##### Email

dr.toheed112@gmail.com

##### Web page address

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## Sponsors / Funding sources

### 1

#### Sponsor

##### Name of organization / entity

The University of Faisalabad

##### Full name of responsible person

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#### Grant name

Anum Toheed

#### Grant code / Reference number

1234

#### Is the source of funding the same sponsor organization/entity?

Yes

#### Title of funding source

The University of Faisalabad

#### Proportion provided by this source

1

#### Public or private sector

Private

#### 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

The University of Faisalabad

##### Full name of responsible person

Anum Toheed

##### Position

Student

##### Latest degree

Master  
**Other areas of specialty/work**  
Physiotherapy  
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## Person responsible for scientific inquiries

### Contact

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Mariam Mahmood  
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Professor  
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## Person responsible for updating data

### Contact

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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

No - There is not 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

IPD will be included their demographic information, medical history ,treatment assignment and outcome measurements.

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

08-11-2023

### To whom data/document is available

Academic

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

For research purpose only

### From where data/document is obtainable

dr.toheed112@gmail.com

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

Inquirer must provide cover letter stating their reason to obtain data and details of the research. If any researcher share their approval letter and summary of the ongoing research. Within a day applicant will be responded.

### Comments