

Clinical Trial Protocol

Iranian Registry of Clinical Trials

28 Aug 2026

Comparative effects of mulligan two-leg rotation technique and muscle energy technique on hamstring flexibility, pain and functional disability in patients with chronic non-specific low back pain

Protocol summary

Study aim

To compare the effects of the Mulligan two-leg rotation technique and the Muscle Energy Technique on pain, hamstring flexibility, and functional disability in patients with chronic non-specific low back pain.

Design

The double-blinded, parallel-assigned, bi-center, randomized clinical trial was done on 108 patients with a history of pain for more than 12 weeks. Patients were assigned by using the lottery method of simple random sampling.

Settings and conduct

The study was conducted at the physiotherapy department of Bakhtawar Amin Hospital, Multan.

Participants/Inclusion and exclusion criteria

Inclusion Criteria: 1. Both gender, 2. Age group of 18-35years. 3. Non-specific low back pain for more than 3 months. 4. Patients with hamstrings tightness measured by Active Knee Extension (AKE) test. Exclusion Criteria: 1. History of fracture or surgery. 2. Low back pain with active systemic or spine pathology. 3. Upper motor neuron or lower motor neuron lesion 4. Pregnancy, psychological risk factor, or subjects apprehensive for the stretching techniques.

Intervention groups

After taking written informed consent, patients meeting the inclusion and exclusion criteria were screened for hamstring tightness by a trained physiotherapist, having greater than 30-degree loss of knee extension. 108 patients were randomly allocated into two groups (54 patients each) by a computer-generated random number table. Group A received Mulligan's two-leg rotation technique with routine physiotherapy and group B received the muscle energy technique with routine physiotherapy. Total 12 sessions were given to both groups, 3 sessions per week. Data was calculated at baseline and after every 6th session.

Main outcome variables

1. Pain measured by Numeric pain rating scale.
2. Hamstring tightness measured by Active knee extension angle.
3. Functional Disability measured by Modified Oswestry Disability Index scale.

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20210821052245N1**
Registration date: **2021-12-07, 1400/09/16**
Registration timing: **retrospective**

Last update: **2021-12-07, 1400/09/16**

Update count: **0**

Registration date

2021-12-07, 1400/09/16

Registrant information

Name

Maryam Razzaq

Name of organization / entity

Bakhtawar Amin Medical and Dental college

Country

Pakistan

Phone

+92 61 6524875

Email address

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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2020-11-20, 1399/08/30

Expected recruitment end date

2021-07-20, 1400/04/29
Actual recruitment start date
 2020-12-01, 1399/09/11
Actual recruitment end date
 2021-08-30, 1400/06/08
Trial completion date
 2021-08-30, 1400/06/08

Scientific title
 Comparative effects of mulligan two-leg rotation technique and muscle energy technique on hamstring flexibility, pain and functional disability in patients with chronic non-specific low back pain

Public title
 Effect of hamstring flexibility in patients with chronic non-specific low back pain.

Purpose
 Treatment

Inclusion/Exclusion criteria
Inclusion criteria:
 Both male and female Age group eighteen to thirty years of age Non-specific low back pain for more than three months. Patients with hamstrings tightness measured by Active Knee Extension (AKE) test with measurement having greater than the thirty-degree loss of knee.
Exclusion criteria:
 Low back pain with active systemic or spine pathology. Upper motor neuron lesion and lower motor neuron lesion Pregnancy, psychological risk factor or subjects apprehensive for the stretching techniques History of fracture or surgery of spine, pelvis, hip or knee.

Age
 From **18 years** old to **35 years** old

Gender
 Both

Phase
 N/A

Groups that have been masked

- Participant
- Outcome assessor

Sample size
 Target sample size: **116**
 Actual sample size reached: **108**

Randomization (investigator's opinion)
 Randomized

Randomization description
 Patients who were eligible were randomly assigned, using the simple random sampling technique by lottery method. Out of the screened patients, 108 patients who fulfill the inclusion criteria were assigned a number. The walk-in patients were assigned by even numbers and odd numbers. Patients coming at the even numbers were included in Group A (Two Leg Rotation) and those with odd numbers were included in Group B (Muscle Energy Technique). 54 patients were included in Group A and 54 patients were assigned to Group B.

Blinding (investigator's opinion)
 Double blinded

Blinding description
 The double blinding technique was used. The assessor

and participants both were blinded to the given technique. In the end, the study was unblinded and researchers and participants was made aware of the treatment groups in which they were allocated.

Placebo
 Not used
Assignment
 Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
 Ethics' committee of The University of Lahore, Faculty of Allied health Science
Street address
 Defence Road Campus, Bhubatian Chowk, Lahore
City
 Lahore
Postal code
 54590
Approval date
 2020-11-19, 1399/08/29
Ethics committee reference number
 IRB-UOL-FAHS/797/2020

Health conditions studied

1

Description of health condition studied
 Chronic Low Back Pain with decreased hamstring flexibility
ICD-10 code
 M54.5
ICD-10 code description
 Low back pain

Primary outcomes

1

Description
 Pain intensity
Timepoint
 Before the intervention and 2,4 weeks
Method of measurement
 Numeric Pain Rating Scale

2

Description
 Hamstring flexibility
Timepoint
 Before intervention, 2,4 week

Method of measurement

Active knee extension test

3

Description

Functional Disability

Timepoint

Before intervention and 2,4 week

Method of measurement

Modified Oswestary Disability Index

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group (Mulligan Two Leg Rotation): After giving the moist hot pack for 20 minutes at the low back area and hamstrings, the therapist stands at the limited hamstrings flexibility side of the patient lying in a supine position. Both legs were flexed to a level that feet are off the table. After stabilizing the patient shoulders on the bed, the patient's leg was fully flexed and slowly taken to the side of the limited hamstring muscle flexibility. When the limit was reached, the position was sustained for 30 seconds with overpressure applied by the therapist, and then the legs were lowered to the plinth. Three repetitions were repeated, and 1 minute rest time was given between each stretch. And the same procedure was done for the other side of limited hamstrings flexibility. Total time duration for this technique was 10 minutes.

Category

Rehabilitation

2

Description

Intervention group (Muscle Energy Technique): Post Isometric Relaxation (PIR) of muscle energy technique was used. After applying the moist hot pack for 20 minutes at the low back and hamstrings the patient was instructed to lie in a supine position with the non-treated leg straight on the table. The therapist passively flexed the treated leg at the hip and the patient knee was straightened on the therapist's shoulder until the primary resistance was felt. The patient was instructed to apply pressure for 7-10 seconds on the therapist's shoulder against resistance by using no more than 25% of their strength during isometric contractions. The contraction period was followed by a relaxation period and then the therapist passively straightened the knee towards its new barrier and held it for 30 seconds. The procedure was repeated 4 times with a 10-second rest interval between them. Total time duration for this technique was 10 minutes.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Bakhtawar Amin Hospital

Full name of responsible person

Maryam Razzaq

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

University of Lahore

Full name of responsible person

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Grant name

Grant code / Reference number

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

No

Title of funding source

UOL

Proportion provided by this source

10

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

Bakhtawar Amin Hospital

Full name of responsible person

Maryam Razzaq

Position

Senior Therapist

Latest degree

Master

Other areas of specialty/work

Physiotherapy

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Person responsible for updating data

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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

Because patient consent was taken only for this study, so I cannot share the data without their permission.

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

Yes - There is a plan to make this available

Title and more details about the data/document

Comparative effects of Mulligan Two Leg Rotation Technique and Muscle Energy Technique on Hamstring flexibility, Pain and Functional Disability in Patients with Chronic Non-Specific Low Back Pain

When the data will become available and for how long

The study is completed and it will be available after publication

To whom data/document is available

To everyone who finds interest.

Under which criteria data/document could be used

Anyone who will request the data,

From where data/document is obtainable

From the Hospital.

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

Through E-mail address and contact number is given.

Comments

Data will be provided on request.