Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Effects of Proprioceptive neuromuscular facilitation stretching vs joint mobilization for improving joint mobility and quality of life in patients with knee osteoarthritis. A randomize controlled trail

Protocol summary

Study aim

The purpose of this study is to assess and contrast how well Proprioceptive neuromuscular facilitation stretching and joint mobilization can enhance joint mobility and quality of life in individuals with knee osteoarthritis.

Design

Randomised, superiority, parallel group trial with blinded outcome assessment on 48 participants. Randomisation was centralised and computerised with concealed randomisation sequence carried out at an external site

Settings and conduct

A randomized, parallel-group, superiority trial with blinded outcome assessment. Participants (n=48) will be randomly assigned using a sealed envelope method into two intervention groups. This is a single-center study conducted at District Headquarter Hospital Bannu over a duration of four weeks.

Participants/Inclusion and exclusion criteria

INCLUSION: Individuals aged between 40 to 75 years diagnosed with knee osteoarthritis based on clinical and radiographic criteria. Participants with a Kellgren-Lawrence grade II–III classification of knee OA.
EXCLUSION: OA patients who have received intra articular injections. Those with neurological disorders affecting lower limb function.

Intervention groups

Control Group (Joint Mobilization - Group B) Participants will receive Maitland joint mobilization (Grade III-IV), including anterior-posterior glides and patellar mobilization, to reduce stiffness and improve mobility. Sessions will be **three times per week for four weeks, progressing in intensity with weight-bearing mobilization.
Experimental Group (PNF Stretching - Group A) Participants will undergo PNF stretching using the hold-relax technique for knee flexors and extensors, with progressive increases in hold duration and integration with functional movements. Sessions will be three times per week for four weeks. Both groups will have a 5–10 minute warm-up and cool-down in each session.

Main outcome variables

Quality of life

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20230907059376N7**
Registration date: **2025-03-24, 1404/01/04**
Registration timing: **prospective**

Last update: **2025-03-24, 1404/01/04**
Update count: **0**

Registration date

2025-03-24, 1404/01/04

Registrant information

Name

Sarmad Khattak

Name of organization / entity

Rehman Medical Institute, Peshawar

Country

Pakistan

Phone

+92 91 5838666

Email address

sarmadkhattak007@gmail.com

Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2025-03-31, 1404/01/11

Expected recruitment end date

2025-07-01, 1404/04/10

Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Effects of Proprioceptive neuromuscular facilitation stretching vs joint mobilization for improving joint mobility and quality of life in patients with knee osteoarthritis. A randomize controlled trail

Public title
Effects of Proprioceptive neuromuscular facilitation stretching vs joint mobilization for improving joint mobility and quality of life in patients with knee osteoarthritis
Purpose
Treatment
Inclusion/Exclusion criteria
Inclusion criteria:
Individuals aged between 40 to 75 years diagnosed with knee osteoarthritis based on clinical and radiographic criteria Patients experiencing moderate to severe knee pain with functional limitations for at least six months. Participants with a Kellgren-Lawrence grade II–III classification of knee OA. Individuals who have not received intra-articular steroid injections or undergone knee surgery in the past six months. Patients who are willing to participate in the study and provide informed consent.
Exclusion criteria:
OA patients who have received intra articular injections. Those with neurological disorders affecting lower limb function. Participants currently undergoing any other physiotherapy interventions targeting knee OA. Patients with severe knee deformities (varus/valgus) impacting normal movement mechanics. Individuals with a history of recent fractures, infections, or malignancy involving the knee joint.
Age
From **40 years** old to **75 years** old
Gender
Both

Phase
N/A
Groups that have been masked

- Outcome assessor

Sample size
Target sample size: **48**
Randomization (investigator's opinion)
Randomized
Randomization description
Participants will be randomly assigned to either the PNF Stretching (Group A) or Joint Mobilization (Group B) using the sealed envelope method to ensure unbiased allocation. Each eligible participant will draw a sealed envelope containing their group assignment. An independent researcher will oversee the randomization process, while the outcome assessor will remain blinded to group allocation. This method minimizes selection bias and ensures equal distribution of participants across both intervention groups.
Blinding (investigator's opinion)
Single blinded
Blinding description
The outcome assessor will be **blinded** to group allocation to minimize bias in data collection and analysis. They will not be informed of participants' assigned interventions and will only assess outcomes based on pre- and post-intervention measurements. This ensures objective evaluation of joint mobility and quality of life improvements.
Placebo
Not used
Assignment
Parallel
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
KMU AS&RB
Street address
5-B/2 Shaukat Khanum Rd, Phase 5 Hayatabad, Peshawar, Khyber Pakhtunkhwa
City
Peshawar
Postal code
25000
Approval date
2025-03-19, 1403/12/29
Ethics committee reference number
KMU/AS&RB/MSPT/2020-04

Health conditions studied

1

Description of health condition studied
Knee osteoarthritis
ICD-10 code
M17.1
ICD-10 code description
Unilateral primary osteoarthritis of knee

Primary outcomes

1

Description
The primary outcome variables are joint mobility in patients with knee osteoarthritis.
Timepoint
Assessments will be conducted at baseline (pre-

intervention) and after four weeks (post-intervention) following the final treatment session. The outcome assessor, who is blinded to group allocation, will perform all measurements to ensure objectivity.

Method of measurement

Joint mobility will be measured using a goniometer to assess knee range of motion (ROM).

Secondary outcomes

empty

Intervention groups

1

Description

Intervention group: Participants in the experimental group will undergo Proprioceptive Neuromuscular Facilitation (PNF) stretching focusing on the knee flexors and extensors. The intervention will follow a hold-relax technique, where targeted muscles will be actively contracted for 5–10 seconds, followed by a passive stretch. The intensity of stretching will gradually increase over four weeks, with longer hold durations and integration with functional movements such as sit-to-stand and step-ups. Sessions will be conducted three times per week for four weeks, with each session lasting 30–45 minutes. Both interventions will be preceded by a 5–10 minute warm-up and followed by a cool-down period to enhance treatment effectiveness and prevent injury

Category

Rehabilitation

2

Description

Control group: Participants in the control group will receive joint mobilization therapy using Maitland mobilization techniques (Grade III-IV). This intervention includes anterior-posterior (AP) glides and patellar mobilization, aimed at reducing joint stiffness, improving synovial fluid movement, and enhancing knee joint mobility. The sessions will be conducted three times per week for four weeks, with each session lasting 30–45 minutes. Mobilization intensity will progress over time, incorporating weight-bearing joint mobilization and sustained holds in later weeks.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

DHQ hospital Bannue

Full name of responsible person

Hira Younis

Street address

XJH9+9RF, DHQ, Bannu, Pakistan

City

Bannue

Postal code

25000

Phone

+92 332 9232832

Email

sarmadkhattak007@gmail.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Khyber Medical University, Peshawar

Full name of responsible person

Hira Younis

Street address

F1 Phase-6 Rd, Phase 5 Hayatabad, Peshawar, Khyber Pakhtunkhwa

City

Peshawar

Postal code

25100

Phone

+92 91 5862514

Email

IPHSS@kmu.edu.pk

Grant name

Grant code / Reference number

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

Yes

Title of funding source

Khyber Medical University, Peshawar

Proportion provided by this source

50

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

Rehman Medical Institute, Peshawar

Full name of responsible person

Sarmad Khattak

Position

Resident Surgeon

Latest degree

Medical doctor

Other areas of specialty/work

Cardiology

Street address
House No. 245 Street 7 Sector N 2 Phase 4 Hayatabad Peshawar
City
Peshawar
Province
Khyber Pkahtunkhwa
Postal code
25000
Phone
+92 91 5838666
Fax
Email
sarmadkhattak007@gmail.com

Person responsible for scientific inquiries

Contact
Name of organization / entity
Rehman Medical Institute, Peshawar
Full name of responsible person
Sarmad Khattak
Position
Resident Surgeon
Latest degree
Medical doctor
Other areas of specialty/work
Cardiology
Street address
House No. 245 Street 7 Sector N 2 Phase 4 Hayatabad Peshawar
City
Peshawar
Province
Khyber Pkahtunkhwa
Postal code
25000
Phone
+92 91 5838666
Fax
Email
sarmadkhattak007@gmail.com

Person responsible for updating data

Contact
Name of organization / entity
Rehman Medical Institute, Peshawar
Full name of responsible person
Sarmad Khattak
Position
Resident Surgeon
Latest degree
Medical doctor
Other areas of specialty/work
Cardiology
Street address
House No. 245 Street 7 Sector N 2 Phase 4 Hayatabad Peshawar
City
Peshawar
Province
Khyber Pkahtunkhwa
Postal code
25000
Phone
+92 91 5838666
Fax
Email
sarmadkhattak007@gmail.com

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
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
The shared data will be shared with the title "Effects of Proprioceptive neuromuscular facilitation stretching vs. Joint Mobilization for Improving Joint Mobility and Quality of Life in Patients with Knee Osteoarthritis: A Randomized Controlled Trial" which will include only primary outcome data i.e. range of motion for all the participants included in the study and completed the program.
When the data will become available and for how long
The data will be made available six months after the publication of study results and will remain accessible for a period of five years.
To whom data/document is available
Deidentified data will be available to researchers affiliated with academic institutions, healthcare organizations, and policymakers conducting relevant research. Industry professionals may request access with justification.
Under which criteria data/document could be used
Access will be granted for scientific research, systematic reviews, and meta-analyses related to physiotherapy, osteoarthritis management, and rehabilitation. All requests will be reviewed by an independent data-sharing committee, ensuring appropriate use aligned with ethical guidelines.
From where data/document is obtainable
Requests for access should be submitted via email to the principal investigator or through the institutional research office at Khyber Medical University (KMU), Institute of Physical Medicine & Rehabilitation (IPM&R). ipmr@kmu.edu.pk
What processes are involved for a request to access data/document
Interested researchers must submit a formal data access

request, including their research objectives, ethical approval (if applicable), and data security measures. The review process may take 4–6 weeks, and approved applicants must sign a data-sharing agreement ensuring compliance with confidentiality and ethical standards.

All shared data will comply with ethical, legal, and institutional guidelines to protect participant confidentiality. Any modifications to the data-sharing plan will be communicated through relevant academic channels.

Comments