

Clinical Trial Protocol

Iranian Registry of Clinical Trials

10 Jun 2026

A comparison between Open with closed kinematic chain exercises of knee on decreasing pain and improving function in subjects with anterior knee pain

Protocol summary

Summary

The purpose of this study was to compare the effect of open kinematic chain exercise with closed kinematic chain exercise of knee in decreasing pain and improving function in subjects with anterior knee pain. This double-blind, randomized clinical trial was carried out in Zahedan University of Medical Sciences, in 2008. Thirty-two patients with anterior knee pain were recruited through simple non-probability sampling. Patients were selected according to the following inclusion criteria: Age between 15-40 years; having anterior knee pain; No history of surgery and trauma; being positive Apprehension and Clark's tests. Subjects were excluded if they presented with any of the following: no completion of the treatment; using other therapeutic modalities during study; trauma; surgery and exacerbation of signs (pain and disability) during the study. Patients were randomly assigned to either an open kinematic chain exercise group (N=16) or a closed kinematic chain exercise group (N=16). Open kinematic chain exercise group received isometric quadriceps and terminal knee extension exercises. Closed kinematic chain exercise group received leg press exercises. For both groups, we used ultrasound waves with a frequency of 1 MHz, pulse mode (1:4), a power of 1.5 W/cm² and lasting 5 minutes on each occasion. A 30 session's treatment program, during 6 weeks, 5 sessions per week was performed for both groups. Before and after intervention, we measured pain through visual analogue scale (VAS) (Ordinal), Knee function with Kujala Scale (Ordinal), and quadriceps strength with Dynatest (Bar).

General information

Acronym

IRCT registration information

IRCT registration number: **IRCT201101201675N5**

Registration date: **2011-06-06, 1390/03/16**

Registration timing: **retrospective**

Last update:

Update count: **0**

Registration date

2011-06-06, 1390/03/16

Registrant information

Name

Asghar Akbari

Name of organization / entity

Zahedan University of Medical Sciences

Country

Iran (Islamic Republic of)

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akbaria@zdmu.ac.ir

Recruitment status

Recruitment complete

Funding source

Vice chancellor for research of Zahedan University of Medical Sciences

Expected recruitment start date

2008-04-29, 1387/02/10

Expected recruitment end date

2008-10-22, 1387/08/01

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

A comparison between Open with closed kinematic chain

exercises of knee on decreasing pain and improving function in subjects with anterior knee pain

Public title

A comparison between Open with closed kinematic chain exercises of knee on decreasing pain and improving function in subjects with anterior knee pain

Purpose

Treatment

Inclusion/Exclusion criteria

Inclusion criteria: Age between 20-40; having anterior knee pain; No history of surgery and trauma; Positive Apprehension and Clark's test. Exclusion criteria: no completion of the treatment; using other therapeutic modalities during study; trauma; surgery and exacerbation of signs (pain and disability) during the study.

Age

From **15 years** old to **40 years** old

Gender

Both

Phase

2

Groups that have been masked

No information

Sample size

Target sample size: **32**

Randomization (investigator's opinion)

Randomized

Randomization description

Blinding (investigator's opinion)

Double blinded

Blinding description

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

1

Registry name

no registration

Secondary trial Id

no trial id

Registration date

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics Committee, Tehran Payam-e- Noor University

Street address

No 233, Cross of Sepand, Shahid nejatolahi St.,

City

Tehran

Postal code

Approval date

2011-05-10, 1390/02/20

Ethics committee reference number

1411/2037

Health conditions studied

1

Description of health condition studied

Anterior knee pain

ICD-10 code

M22.2

ICD-10 code description

Patellofemoral disorders

Primary outcomes

1

Description

Anterior knee pain

Timepoint

Before intervention, 6 weeks after intervention

Method of measurement

Visual Analogue Scale

2

Description

knee function

Timepoint

Before intervention, 6 weeks after intervention

Method of measurement

Kujala scale

3

Description

quadriceps muscle strength

Timepoint

Before intervention, 6 weeks after intervention

Method of measurement

Dynamometer Dynatest

Secondary outcomes

empty

Intervention groups

1

Description

Closed kinematic chain exercise including leg press exercises; ultrasound waves with a frequency of 1 MHz, puls mode (1:4), a power of 1.5 W/cm² and lasting 5 minutes on each occasion.

Category

Rehabilitation

2

Description

Open kinematic chain exercise including isometric quadriceps exercises and terminal knee extension; ultrasound waves with a frequency of 1 MHz, puls mode (1:4), a power of 1.5 W/cm² and lasting 5 minutes on each occasion.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Razmejo-Moghadam physiotherapy clinic, Zahedan

Full name of responsible person

Dr. Asghar Akbari

Street address

Razmejo-Moghadam Laboratory, School of Rehabilitation Sciences, Zahedan University of Medical Sciences, Ayatoallah Kafami St.

City

Zahedan

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Vice chancellor for research of Zahedan University of Medical Sciences

Full name of responsible person

Dr Hamid Reza Mahmoudzadeh

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Jannat Blv,Paradise of Zahedan University of Medical Sciences, Vice chancellor for research,Zahedan University of Medical Sciences

City

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Grant name

Grant code / Reference number

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

Yes

Title of funding source

Vice chancellor for research of Zahedan University of Medical Sciences

Proportion provided by this source

100

Public or private sector

empty

Domestic or foreign origin

empty

Category of foreign source of funding

empty

Country of origin

Type of organization providing the funding

empty

Person responsible for general inquiries

Contact

Name of organization / entity

Zahedan University of Medical Sciences

Full name of responsible person

Dr. Asghar Akbari

Position

Associate Professor, Head of Dept. of Physiotherapy, PhD

Other areas of specialty/work

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Sharing plan**Deidentified Individual Participant Data Set (IPD)**

empty

Study Protocol

empty

Statistical Analysis Plan

empty

Informed Consent Form

empty

Clinical Study Report

empty

Analytic Code

empty

Data Dictionary

empty