Clinical Trial Protocol
Iranian Registry of Clinical Trials

08 Nov 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

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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 Committe,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
Zahedan

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