Clinical Trial Protocol
Iranian Registry of Clinical Trials

19 Sep 2026

The effect and follow up of neuromuscular exercise in water on strength, co-contraction, quality of life, proprioception and balance of the knee in women with grade 2&3 knee OA

Protocol summary

Study aim
The current research aims to investigate the effect of 8 weeks of neuromuscular exercise in water and its follow up on strength, co-contraction, knee joint proprioception and balance in women with knee osteoarthritis with severity 2 and 3.

Design
Clinical trial with two experimental groups, non-randomized, on 24 patients with knee arthritis.

Settings and conduct
Testing of examinees will be done at the laboratory of the Faculty of Physical Education; presentation of the training protocol will be done in the swimming pool of the Faculty of Physical Education of Bahonar University of Kerman for 8 weeks.

Participants/Inclusion and exclusion criteria
Entry: age 50-65, ability to perform daily activities, absence of inflammatory, nervous, mental illness, having grade two and three knee arthritis Failure to enter: not meeting the requirements of the health questionnaire, use of sedative and painkillers, presence of abnormality

Intervention groups
We will examine a type of neuromuscular exercises designed in water on women with knee arthritis in two severity groups of two and three knee arthritis, and we will also measure the effect of these exercises on the complications caused by arthritis.

Main outcome variables
Reducing the complications of knee arthritis; Increase the quality of life

General information

Reason for update

Acronym

IRCT registration information
IRCT registration number: **IRCT20231015059728N1**
Registration date: **2023-11-07, 1402/08/16**
Registration timing: **registered_while_recruiting**

Last update: **2023-11-07, 1402/08/16**
Update count: **0**

Registration date
2023-11-07, 1402/08/16

Registrant information

Name
Sahar Khajeh

Name of organization / entity
Shahid bahonar kerman

Country
Iran (Islamic Republic of)

Phone
+98 34 3211 8316

Email address
khaje.sahar@yahoo.com

Recruitment status
Recruitment complete

Funding source

Expected recruitment start date
2023-11-06, 1402/08/15

Expected recruitment end date
2023-11-16, 1402/08/25

Actual recruitment start date
empty

Actual recruitment end date
empty

Trial completion date
empty

Scientific title
The effect and follow up of neuromuscular exercise in water on strength, co-contraction, quality of life, proprioception and balance of the knee in women with

grade 2&3 knee OA

Public title
The effect and follow up of neuromuscular exercise in water on complications of knee OA
Purpose
Supportive
Inclusion/Exclusion criteria
Inclusion criteria:
Female gender and being in the age range of 50 to 65 Ability to walk and perform daily activities without using an assistive device People with second- and third-degree knee arthritis Absence of inflammatory disease Not having a mental or nervous illness
Exclusion criteria:
Having a history of sensorimotor disorders or severe vision problems Existence of pathological symptoms, history of fracture, surgery and joint disease in the lower limb and knee joint replacement Not having the requirements of the general health questionnaire and fitness for physical activity Use of relaxing and pain-relieving medication 48 hours before the test The presence of any visible abnormalities in the lower limbs Inability to perform tests or training programs Participation in regular training programs outside of research
Age
From **50 years** old to **65 years** old
Gender
Female

Phase
N/A
Groups that have been masked
No information
Sample size
Target sample size: **30**
Randomization (investigator's opinion)
Not randomized
Randomization description
Blinding (investigator's opinion)
Not blinded
Blinding description
Placebo
Not used
Assignment
Other
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Shahid Bahonar University of Kerman
Street address
shafa street
City
kerman
Province
Kerman
Postal code
7618759632
Approval date
2023-05-05, 1402/02/15
Ethics committee reference number
IR.UK.REC.1402.002

Health conditions studied

1

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

Primary outcomes

1

Description
Knee Arthritis
Timepoint
At the beginning of the study (before the start of the intervention) and 59 days after the start of aquatic exercises
Method of measurement
General health questionnaire and KOOS

2

Description
Strength
Timepoint
At the beginning of the study (before the start of the intervention) and 59 days after the start of aquatic exercises
Method of measurement
Electromyography device, surface electrode

3

Description
Co-contraction
Timepoint
At the beginning of the study (before the start of the intervention) and 89"59 days after the start of aquatic exercises
Method of measurement
Electromyography device, surface electrode

4

Description
Quality of life
Timepoint
At the beginning of the study (before the start of the

intervention) and 59 days after the start of aquatic exercises

Method of measurement

SF36

5

Description

Proprioception

Timepoint

At the beginning of the study (before the start of the intervention) and 59 days after the start of aquatic exercises

Method of measurement

Autocad software, green skin markers, digital camera for measuring posture.

6

Description

Balance

Timepoint

At the beginning of the study (before the start of the intervention) and 59 days after the start of aquatic exercises

Method of measurement

Biodex

Secondary outcomes

1

Description

Plantar pressure

Timepoint

At the beginning of the study (before the start of the intervention) and 59 days after the start of aquatic exercises

Method of measurement

Plantar pressure measuring device

Intervention groups

1

Description

Intervention group: Women with knee arthritis with severity of 2, 8 weeks of muscle nerve training will be given in the water, muscle nerve training is a type of training that is done in all planes of motion, in all directions, and includes all agility, strength, flexibility, balance and functional training. Sessions A training will be given three days a week for two months and a duration of one hour.

Category

Rehabilitation

2

Description

Intervention group: Women with knee arthritis with severity of 3, 8 weeks of muscle nerve training will be given in the water, muscle nerve training is a type of training that is done in all planes of motion, in all directions, and includes all agility, strength, flexibility, balance and functional training. Sessions A training will be given three days a week for two months and a duration of one hour.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Faculty of Physical Education

Full name of responsible person

Sahar Khajeh

Street address

Faculty of Physical Education, after the railway bridge, Islamic Republic Blvd.

City

Kerman

Province

Kerman

Postal code

7616913439

Phone

+98 34 3325 7141

Email

khaje.sahar@yahoo.com

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Shahid Bahonar University of Kerman

Full name of responsible person

Dr. Alireza Saeedi

Street address

Pajohesh square, Shahid Bahonar University of Kerman, Faculty of Physical Education

City

KERMAN

Province

Kerman

Postal code

7616913439

Phone

+98 34 3132 3186

Email

khaje.sahar@yahoo.com

Grant name

Grant code / Reference number

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

No

Title of funding source

Faculty of Physical Education and Sahar Khajeh

Proportion provided by this source

100

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

Shahid Bahonar University of Kerman

Full name of responsible person

Sahar Khajeh

Position

Tuition

Latest degree

Master

Other areas of specialty/work

sport injury

Street address

Faculty of Physical Education, Shahid Bahonar University of Kerman, Pajohesh Square

City

Kerman

Province

Kerman

Postal code

76116913439

Phone

+98 34 3132 3186

Email

khaje.sahar@yahoo.com

Person responsible for scientific inquiries

Contact

Name of organization / entity

Shahid Bahonar University of Kerman

Full name of responsible person

Sahar Khajeh

Position

Tuition

Latest degree

Master

Other areas of specialty/work

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Person responsible for updating data

Contact

Name of organization / entity

Shahid Bahonar University of Kerman

Full name of responsible person

Sahar Khajeh

Position

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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

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

Not applicable

Data Dictionary

Not applicable

Title and more details about the data/document

Only a part of the data, such as the information related to the main outcome or the like, can be shared.

When the data will become available and for how long

"Starting the access period 6 months after printing the results".

To whom data/document is available

It will be available to everyone

Under which criteria data/document could be used

It can be used to improve scientific documentation.

From where data/document is obtainable

sahar khajeh

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

email

Comments