

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

04 Aug 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

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KERMAN

**Province**

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**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  
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Faculty of Physical Education, Shahid Bahonar  
University of Kerman, Pajohesh Square  
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## Person responsible for scientific inquiries

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Tuition  
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## Person responsible for updating data

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7616913439  
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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**