# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

07 Nov 2026

## Synergistic effect of undenatured collagen type 2 supplementation and knee strengthening exercises in knee osteoarthritis

## Protocol summary

**Study aim**

The study aims to evaluate the comparative effects of undenatured collagen type 2 supplementation, knee strengthening exercise program, on reducing pain and improving joint function in patients with osteoarthritis and degenerative changes.

**Design**

Pragmatic, community based, parallel group, double blinded, randomized controlled trial. Total 377 patients will be enrolled. Patients who met our inclusion criteria will be randomized into three groups.

**Settings and conduct**

Muhammad physical therapy clinic and rehabilitation center, Multan.

**Participants/Inclusion and exclusion criteria**

Inclusion Criteria: Adults aged between 35–65 years with mild-to-moderate knee osteoarthritis, knee pain for at least 3 months, able to perform physical activity and follow an exercise regimen, not taking any other osteoarthritis-related medications Exclusion Criteria: Presence of other types of arthritis, history of knee surgery or any intra-articular injections in the past 6 months, currently using immunosuppressive therapy , serious systemic diseases Pregnancy, breastfeeding, known allergy or intolerance to collagen supplements or any ingredients in the intervention product.

**Intervention groups**

Group 1: Will receive 40 mg/day of undenatured collagen type II supplementation. Group 2: Will be given a standardized knee-strengthening exercise program [specify duration and frequency, e.g., three times per week for 45 minutes]. Group 3: Will recieve UC-II supplementation and participated in the knee-strengthening exercise program..

**Main outcome variables**

Knee X rays; Western Ontario and McMaster Universities Osteoarthritis Index scale; Numeric Pain Rating Scale; Pain Catastrophizing Scale; Knee Range of Motion (goniometry); Knee injury outcome (KOOS); Muscle strength (dynamometer); Quality of life (SF-36); C-reactive protein; Interleukin-6

## General information

**Reason for update**

**Acronym**

**IRCT registration information**

IRCT registration number: **IRCT20230202057310N11**
Registration date: **2024-12-22, 1403/10/02**
Registration timing: **prospective**

Last update: **2024-12-22, 1403/10/02**
Update count: **0**

**Registration date**

2024-12-22, 1403/10/02

**Registrant information**

**Name**

Imran Ahmad Khan

**Name of organization / entity**

Muhammad Nawaz Shareef University of Agriculture, Multan

**Country**

Pakistan

**Phone**

+92 333 6120602

**Email address**

imran.ahmad@mnsuam.edu.pk

**Recruitment status**

**Recruitment complete**

**Funding source**

**Expected recruitment start date**

2025-01-05, 1403/10/16

**Expected recruitment end date**

2025-04-05, 1404/01/16

**Actual recruitment start date**

empty

**Actual recruitment end date**
empty
**Trial completion date**
empty

**Scientific title**
Synergistic effect of undenatured collagen type 2 supplementation and knee strengthening exercises in knee osteoarthritis

**Public title**
Undenatured collagen type 2 supplementation and knee strengthening exercises in knee osteoarthritis
**Purpose**
Treatment
**Inclusion/Exclusion criteria**
**Inclusion criteria:**
Adults aged between 35–65 years. Diagnosed with mild-to-moderate knee osteoarthritis based on: Radiographic confirmation (Kellgren-Lawrence grade :1–3). Experiencing knee pain for at least 3 months Able to perform physical activity and follow an exercise regimen Willing to take undenatured collagen type II supplementation as prescribed Not taking any other osteoarthritis-related medications or willing to maintain a washout period of at least 2 weeks prior to enrollment Provided written informed consent to participate in the study.
**Exclusion criteria:**
1. Diagnosed with severe knee osteoarthritis (Kellgren-Lawrence grade 4). History of knee surgery or any intra-articular injections (e.g., corticosteroids, hyaluronic acid) in the past 6 months. Currently using immunosuppressive therapy or corticosteroids Pregnancy, breastfeeding, or planning to become pregnant during the study Presence of serious systemic diseases Known allergy or intolerance to collagen supplements or any ingredients in the intervention product Presence of other types of arthritis such as rheumatoid arthritis, gout, or infectious arthritis.
**Age**
From **35 years** old to **65 years** old
**Gender**
Both

**Phase**
1
**Groups that have been masked**

- Outcome assessor
- Data analyser

**Sample size**
Target sample size: **377**
**Randomization (investigator's opinion)**
Randomized
**Randomization description**
This randomization will be done by computer-generated numbers to ensure fairness. Medications will be given in numbered white boxes, each with a unique medication number. The treatment codes will be kept by the principal investigator.
**Blinding (investigator's opinion)**
Double blinded
**Blinding description**
Statistical analyser and outcome assessor will be kept blind so that the result obtained will be without biasness.
**Placebo**
Not used
**Assignment**
Parallel
**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

**Ethics committee**
**Name of ethics committee**
The Institutional Ethical Committee of Muhammad Institute of Medical and Allied Sciences
**Street address**
Bosan Road
**City**
Multan
**Postal code**
66000
**Approval date**
2024-11-21, 1403/09/01
**Ethics committee reference number**
MIMAS/7/91/IAK

## Health conditions studied

### 1

**Description of health condition studied**
Knee osteroarthritis
**ICD-10 code**
M19.0
**ICD-10 code description**
Primary osteoarthritis of other joints

## Primary outcomes

### 1

**Description**
Osteophytes
**Timepoint**
12 weeks
**Method of measurement**
Knee Xray

### 2

**Description**
Pain, stiffness and ADLs
**Timepoint**
12 weeks
**Method of measurement**
NPRS and WOMAC Scale

**3**

**Description**
Knee ROM
**Timepoint**
12 weeks
**Method of measurement**
Goniometry

## Secondary outcomes

**1**

**Description**
Knee injury outcome
**Timepoint**
12 weeks
**Method of measurement**
Knee injury outcome score (KOOS)

**2**

**Description**
Quality of life
**Timepoint**
12 weeks
**Method of measurement**
SF-36

## Intervention groups

**1**

**Description**
Intervention group: Will receive 40 mg/day of undenatured collagen type II supplementation.
**Category**
Treatment - Drugs

**2**

**Description**
Intervention group: Will be given a standardized knee-strengthening exercise program [specify duration and frequency, e.g., three times per week for 45 minutes].The knee-strengthening exercise program focused on improving muscle strength, joint stability, and functional mobility. It included:• Warm-up: [e.g., 5 minutes of light cycling or walking].• Strengthening exercises: Quadriceps setting, hamstring curls, straight leg raises, and step-ups. Each exercise was performed in sets of 10 repetitions with progressive intensity over the study period.• Cool-down: [specify activities, e.g., 5 minutes of stretching or slow walking].Participants were supervised by trained physiotherapists to ensure adherence and proper technique.
**Category**
Rehabilitation

**3**

**Description**
Intervention group: Will recieve UC-II supplementation and participated in the knee-strengthening exercise program.
**Category**
Other

## Recruitment centers

**1**

**Recruitment center**
**Name of recruitment center**
Muhammad Rehabilitation Centre, Multan
**Full name of responsible person**
Komal Ammar Bukhari
**Street address**
Multan
**City**
MULTAN
**Postal code**
66000
**Phone**
+92 333 6120602
**Email**
komalbukhari608@gmail.com

## Sponsors / Funding sources

**1**

**Sponsor**
**Name of organization / entity**
Muhammad Institute of Medical and Allied Sciences, Multan, Pakistan
**Full name of responsible person**
Qurat Ul Ain
**Street address**
Bosan Road
**City**
Multan
**Postal code**
66000
**Phone**
+92 312 6827130
**Email**
qain0635@gmail.com
**Grant name**
Student fund
**Grant code / Reference number**
MIMAS/08/26/Kashifa
**Is the source of funding the same sponsor organization/entity?**
Yes
**Title of funding source**
Muhammad Institute of Medical and Allied Sciences, Multan, Pakistan
**Proportion provided by this source**
70
**Public or private sector**
Private
**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**

Muhammad Institute of Medical and Allied Sciences, Multan, Pakistan.

**Full name of responsible person**

Maliha Khalid Khan

**Position**

Punjab

**Latest degree**

Medical doctor

**Other areas of specialty/work**

Physiotherapy

**Street address**

Multan

**City**

MULTAN

**Province**

Punjab

**Postal code**

66000

**Phone**

+92 333 6120602

**Email**

malihatareen1997@gmail.com

## Person responsible for scientific inquiries

**Contact**

**Name of organization / entity**

Muhammad Nawaz Sharif University of Agriculture Multan

**Full name of responsible person**

Imran Ahmad Khan

**Position**

Punjab

**Latest degree**

Ph.D.

**Other areas of specialty/work**

Medical Pharmacy

**Street address**

Old shuja Abad road Multan

**City**

Multan

**Province**

Punjab

**Postal code**

66000

**Phone**

+92 333 6120602

**Email**

imran.ahmad@mnsuam.edu.pk

## Person responsible for updating data

**Contact**

**Name of organization / entity**

Muhammad Institute of Medical and Allied Sciences, Multan, Pakistan.

**Full name of responsible person**

Syeda Kashifa Shafaq

**Position**

Punjab

**Latest degree**

Bachelor

**Other areas of specialty/work**

Physiotherapy

**Street address**

Multan

**City**

MULTAN

**Province**

Punjab

**Postal code**

66000

**Phone**

+92 312 9634950

**Email**

kashifashafaqsyeda@gmail.com

## Sharing plan

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

Undecided - It is not yet known if there will be a plan to make this available

**Study Protocol**

Undecided - It is not yet known if there will be a plan to make this available

**Statistical Analysis Plan**

Undecided - It is not yet known if there will be a plan to make this available

**Informed Consent Form**

Undecided - It is not yet known if there will be a plan to make this available

**Clinical Study Report**

Undecided - It is not yet known if there will be a plan to make this available

**Analytic Code**

Undecided - It is not yet known if there will be a plan to make this available

**Data Dictionary**

Undecided - It is not yet known if there will be a plan to make this available