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The effectiveness of E-health rehabilitation for patients with knee osteoarthritis

Submission date
31/10/2025

Recruitment status
No longer recruiting

Registration date
04/11/2025

Overall study status
Completed

Last Edited
15/04/2026

Condition category
Musculoskeletal Diseases

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol
Background and study aims
This study aims to test whether a telerehabilitation program using a smartphone app can improve muscle strength, pain, physical performance, and adherence to exercise among people with knee osteoarthritis (KOA). Traditional home exercise programs are effective but often suffer from poor long-term adherence. Using technology like a smartphone app may help patients follow their programs more consistently through video demonstrations, reminders, and therapist communication.

Who can participate?
Adults aged 40–70 years who have been diagnosed with grade II or III knee osteoarthritis for at least 6 months, have mild to moderate pain (rated 4–7 on a 0–10 scale), can walk without assistance, can read Arabic, and can use a smartphone.

What does the study involve?
Participants will be randomly assigned to one of two groups:
App-based group: Use a smartphone application providing resistance exercises with videos, reminders, and therapist feedback.
Paper-based group: Receive the same exercises in a printed booklet.
Both groups will perform the exercises three times per week for 6 weeks. Assessments will take place before and after the 6-week program, including tests for pain, muscle strength, physical function, and exercise adherence.

What are the possible benefits and risks of participating?
Participants may experience less pain, stronger muscles, better physical performance, and improved confidence in managing their condition. Risks are minimal but may include temporary discomfort or muscle soreness after exercise.

Where is the study run from?
The study will be conducted at Al-Aqiq General Hospital in Al-Baha, Saudi Arabia.

When is the study starting and how long is it expected to run for?
December 2024 to June 2026

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
Dr Rawan Aldhabi, raldhabi@kau.edu.sa

Contact information

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Study information

Scientific Title
Effectiveness of telerehabilitation-based resistance exercise using a smartphone application in improving muscle strength, pain, physical performance, and adherence among patients with knee osteoarthritis: a randomized controlled trial

Study objectives
Principal Objective:
To evaluate the effectiveness of telerehabilitation-based resistance exercises delivered through a smartphone app compared to paper-based exercises in improving muscle strength, pain, physical performance, and adherence in patients with knee osteoarthritis.

Hypotheses:
1. The smartphone app–based telerehabilitation program will lead to greater improvements in muscle strength compared to the paper-based program.
2. The app-based program will reduce pain and improve physical performance more effectively.
3. The app-based program will enhance adherence to exercise by increasing self-efficacy and motivation.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 09/12/2024, Scientific Research Committee at Albaha Health Cluster (6720 South Road, Building 3716, Albaha, 65784, Saudi Arabia; +966 (0)114579300; info@shc.gov.sa), ref: KFH /IRB0901202024/7

Primary study design
Interventional

Study design
interventional single-blinded randomized controlled trial

Study type(s)
Efficacy

Health condition(s) or problem(s) studied
Knee osteoarthritis (KOA)

Interventions
Participants eligible for the study will be randomly assigned in a 1:1 ratio to either the intervention group (app-based home exercise program) or the control group (paper-based home exercise program) using a computer-generated block randomization method with variable block sizes to ensure balanced allocation. Allocation will be concealed using sequentially numbered, opaque sealed envelopes prepared by an independent researcher.

App-based group: Use a smartphone application providing resistance exercises with videos, reminders, and therapist feedback.
Paper-based group: Receive the same exercises in a printed booklet.

Both groups will perform the exercises three times per week for 6 weeks. Assessments will take place before and after the 6-week program, including tests for pain, muscle strength, physical function, and exercise adherence.

Intervention Type
Behavioural

Primary outcome(s)
1. Pain is measured using the Arabic Numeric Pain Rating Scale (ANPRS) at baseline and 6 weeks post-intervention
2. Osteoarthritis symptoms, including pain, stiffness, and physical function, are measured using the Arabic version of the WOMAC at baseline and 6 weeks post-intervention
3. Quadriceps muscle strength is measured using a hand-held dynamometer (HHD, microFET®2) at baseline and 6 weeks post-intervention

Key secondary outcome(s)
1. Exercise adherence is measured using a self-reported exercise logbook, with adherence ratio calculated weekly over 6 weeks
2. Exercise self-efficacy is measured using the Arabic Exercise Self-Efficacy Scale (ESES-A) at baseline and 6 weeks post-intervention
3. Lower-limb functional strength is measured using the 30-Second Chair Stand Test (30 CST) and Five-Times Sit-to-Stand Test (FTSST) at baseline and 6 weeks post-intervention
4. Dynamic balance and mobility are measured using the Timed-Up and Go (TUG) test at baseline and 6 weeks post-intervention

Completion date
01/06/2026

Eligibility

Key inclusion criteria
1. Adults aged 40–70 years
2. Diagnosed with mild-to-moderate KOA
3. Able to use a smartphone
4. Able to perform resistance exercises independently

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
40 Years

Upper age limit
70 Years

Sex
All

Total final enrolment
100

Key exclusion criteria
1. Severe KOA or knee surgery in the past 6 months
2. Neurological or musculoskeletal disorders affecting lower limbs
3. Cognitive impairment or inability to follow instructions

Date of first enrolment
15/11/2025

Date of final enrolment
01/03/2026

Locations

Countries of recruitment
Saudi Arabia

Study participating centre
Al-Aqiq General Hospital
3400, Al Aqiq Saudi Arabia
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Sponsor information

Organisation
Scientific Research Committee of Al-Baha Health Cluster

Funder(s)

Funder type
Other

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan
Individual participant data (IPD) that underlie the results reported in this study will be made available upon reasonable request from the Principal Investigator (Dr Rawan Aldhabi; Raldhabi@kau.edu.sa)

IPD sharing plan summary
Available on request