Cochrane Database Syst Rev. 2015 Jan 9;1:

Exercise for osteoarthritis of the knee. Fransen M

Ageing of the population and increased global prevalence of obesity are anticipated to dramatically increase the prevalence of knee OA and its associated impairments. **No cure for knee OA is known, but exercise therapy is among the dominant non-pharmacological interventions recommended by international guidelines**.

RCTs
Land-based therapeutic exercise Vs opposed to exercise conducted in the water

We conducted analyses on continuous outcomes (pain, physical function and quality of life (two to six months, and longer than six months).

In total, we extracted data from 54 studies. Overall, 19 (20%) studies reported adequate random.

High-quality evidence from 44 trials (3537 participants)

Pain was estimated at 44 points on a 0 to 100-point scale in the control group; exercise reduced pain by an equivalent of 12 points

Exercise improved **physical function**
Physical function was estimated at 38 points on a 0 to 100-point scale (0 indicated no loss of physical function) in the control group; exercise improved physical function by an equivalent of 10 points

High-quality evidence from 13 studies (1073 participants) revealed that exercise improved **quality of life** (SMD 0.28, 95% CI 0.15 to 0.40) immediately after treatment. Quality of life was estimated at 43 points in the control group; exercise improved quality of life by an equivalent of 4 points

Eight studies reported adverse events, all of which were related to increased knee or low back pain attributed to the exercise intervention provided.

Marked variability was noted across included studies among participants recruited, symptom duration, exercise interventions assessed and important aspects of study methodology.

Individually delivered programmes tended to result in greater reductions in pain and improvements in physical function, **compared to class-based exercise programmes or home-based programmes; however between-study** heterogeneity was marked within the individually provided treatment delivery subgroup.

AUTHORS' CONCLUSIONS:
High-quality evidence indicates **that land-based therapeutic exercise provides short-term benefit** that is sustained for at least **two to six months after cessation** of formal treatment in terms of reduced knee pain, and moderate-quality evidence shows improvement in physical function among people with knee OA.

The magnitude of the **treatment effect would be considered moderate** (immediate) to small (two to six months) but comparable with estimates reported for non-steroidal anti-inflammatory drugs.

Despite the lack of blinding we did not downgrade the quality of evidence for risk of performance or detection bias. This reflects our belief that further research in this area is unlikely to change the findings of our review.

Self-management education programmes for osteoarthritis. Cochrane Database Syst Rev. 2014 Jan 15;1
Kroon

Self-management education programmes are complex interventions specifically targeted at patient education and behaviour modification. They are designed to encourage people with chronic disease to take an active self-management role to supplement medical care and improve outcomes.

Randomised controlled trials of self-management education programmes in people with osteoarthritis were included. Studies with participants receiving passive recipients of care and studies comparing one type of programme versus another were excluded.

We included **twenty-nine studies (6,753 participants**) that compared

self-management education programmes to attention control (five studies), usual care (17 studies), information alone (four studies) or another intervention (seven studies).

Compared with attention control, **self-management programmes may not result** in significant benefits at 12 months.

Low-quality evidence from one study (344 people) indicates that **self-management skills were similar in active and control groups:** 5.8 points on a 10-point self-efficacy scale in the control group, and the mean difference (MD) between groups was 0.4 points (95% confidence interval (CI) -0.39 to 1.19).

Conclusions:
Low to moderate quality evidence indicates that self-management education programmes result in no or small benefits in people with osteoarthritis but are unlikely to cause harm.

Compared with attention control, these programmes probably do not improve self-management skills, pain, osteoarthritis symptoms, function or quality of life, and have unknown effects on positive and active engagement in life.

Compared with usual care, they may slightly improve self-management skills, pain, function and symptoms, although these benefits are of unlikely clinical importance.

Trials assessing other models of self-management education programme delivery may be warranted.

J Physiother. 2015 Aug 27. pii: S1836-9553.

Train High Eat Low for Osteoarthritis study (THE LO study): protocol for a randomized controlled trial.

The knee adduction moment is recognized as a surrogate measure of the medial tibio-femoral compartment joint load and therefore represents a valid intervention target. This article provides the rationale and methodology for THE LO study (Train High, Eat Low for Osteoarthritis), which is a randomized controlled trial that is investigating the effects of a unique, targeted lifestyle intervention in overweight/obese adults with symptomatic medial knee OA.

RESEARCH QUESTION:
Compared to a control group given only lifestyle advice, do the effects of the following interventions result in significant reductions in the knee adduction moment: (1) gait retraining; and (2) combined intervention (which involves a combination of three interventions**: (a) gait retraining, (b) high-intensity progressive resistance training, and (c) high-protein/low-glycaemic-index energy-restricted diet)?**

It is hypothesized that the combined intervention group will be superior to the isolated interventions of the high-protein/low-glycaemic-index diet group and the progressive resistance training group.

MEASUREMENTS:
Outcomes are measured at baseline, 6 and 12 months. **The primary outcome is the peak knee adduction moment during** the early stance phase of gait. The secondary outcome measures are both structural (radiological), with longitudinal reduction in medial minimal joint space width at 12 months, and clinical, including: change in body mass index; joint pain, stiffness and function; body composition; muscle strength; physical performance/mobility; nutritional intake; habitual physical activity and sedentary behaviour; sleep quality; psychological wellbeing and quality of life.
DISCUSSION:
THE LO study will provide **the first direct comparison of the long-term benefits of gait retraining, progressive resistance training and a high-protein/low-glycaemic-index energy-restricted diet,** separately and in combination, on joint load, radiographic progression, symptoms, and associated co-morbidities in overweight/obese adults with OA of the knee.

Arthritis Rheum. 2004 May;50(5):1501-10.

Exercise and dietary weight loss in overweight and obese older adults with knee osteoarthritis: the Arthritis, Diet, and Activity Promotion Trial. Messier

A randomized, single-blind clinical trial lasting 18 months that was designed to determine whether long-term exercise and dietary weight loss

Of the 316 randomized participants, 252 (80%) completed the study.

In the diet plus exercise group, significant improvements in self-reported physical function ($P < 0.05$), 6-minute walk distance ($P < 0.05$), stair-climb

time (P < 0.05), and knee pain (P < 0.05) relative to the healthy lifestyle group were observed.

In the exercise group, a significant improvement in the 6-minute walk distance (P < 0.05) was observed.

The diet-only group was not significantly different from the healthy lifestyle group for any of the functional or mobility measures. The weight-loss groups lost significantly (P < 0.05) more body weight (for diet, 4.9%; for diet plus exercise, 5.7%) than did the healthy lifestyle group (1.2%). Finally, changes in joint space width were not different between the groups.

CONCLUSION:
The combination of modest weight loss plus moderate exercise provides better overall improvements in self-reported measures of function and pain and in performance measures of mobility in older overweight and obese adults with knee OA compared with either intervention alone.

BMC Musculoskelet Disord. 2013 Jul 15;14:208. doi: 10.1186/1471-2474-14-208.

Strength Training for Arthritis Trial (START): design and rationale.

Messier SP,

Muscle loss and fat gain contribute to the disability, pain, and morbidity associated with knee osteoarthritis (OA), and thigh muscle weakness is an independent and modifiable risk factor for it.

However, while all published treatment guidelines recommend muscle strengthening exercise to combat loss of muscle mass and strength in knee OA patients, previous strength training studies either used intensities or loads below recommended levels for healthy adults or were generally short, lasting only 6 to 24 weeks.

The efficacy of high-intensity strength training in improving OA symptoms, slowing progression, and affecting the underlying mechanisms has not been examined due to the unsubstantiated belief that it might exacerbate symptoms. We hypothesize that in addition to short-term clinical benefits, combining greater duration with high-intensity strength training will alter thigh composition sufficiently to attain long-term reductions in knee-joint forces, lower pain levels, decrease inflammatory cytokines, and slow OA progression.

METHODS/DESIGN:
372 older (age ≥ 55 yrs) ambulatory
Mild-to-moderate medial tibiofemoral OA

20 kg.m-2 ≥ BMI ≤ 45 kg.m-2;

No participation in a formal strength-training program for more than 30 minutes per week within the past 6 months.

Participants are randomized to one of 3 groups:
I high-intensity strength training

II low-intensity strength training

III Healthy living education.

The primary clinical aim is to compare the interventions' effects on knee pain, and compare their effects on knee-joint compressive forces during walking.

II dary: function, mobility

Results of this trial will provide critically needed guidance for clinicians in a variety of health professions who prescribe and oversee treatment and prevention of OA-related complications. Given the prevalence and impact of OA and the widespread availability of this intervention, assessing the efficacy of optimal strength training has the potential for immediate and vital clinical impact.

Rheumatol Int. 2012 Nov;32(11):3339-51. doi: 10.1007/s00296-012-2480-7. Epub 2012 Jul 22.

The effectiveness of proprioceptive-based exercise for osteoarthritis of the knee: a systematic review and meta-analysis. Smith

The purpose of this study was to determine the effectiveness of proprioceptive exercises for knee OA using meta-analysis.

. Studies were included if they were full publications of randomized or non-randomised controlled trials (RCT) comparing a proprioceptive exercise

regime, against a non-proprioceptive exercise programme or non-treatment control for adults with knee OA.

The methodological quality of the evidence base was moderate.

Compared to a non-treatment control, proprioceptive exercises significantly improved functional outcomes in people with knee OA during the first 8 weeks following commencement of their exercises ($p < 0.02$).

When compared against a general non-proprioceptive exercise programme, proprioceptive exercises demonstrated similar outcomes, only providing superior results with respect to joint position sense-related measurements such as timed walk over uneven ground ($p = 0.03$) and joint position angulation error ($p < 0.01$).

Proprioceptive exercises are efficacious in the treatment of knee OA. There is some evidence to indicate the effectiveness of proprioceptive exercises compared to general strengthening exercises in functional outcomes.

BMJ. 2007 Oct 20;335(7624):812. Epub 2007 Sep 20.

Effectiveness of physiotherapy exercise after knee arthroplasty for osteoarthritis: systematic review and meta-analysis of randomised controlled trials.

Minns Lowe CJ1, Barker KL, Dewey M, Sackley CM.

Six trials were identified, five of which were suitable for inclusion in meta-analyses. There was a small to moderate standardised effect size (0.33, 95% confidence interval 0.07 to 0.58) in favour of functional exercise for function three to four months postoperatively. There were also small to moderate weighted mean differences of 2.9 (0.61 to 5.2) for range of joint motion and 1.66 (-1 to 4.3) for quality of life in favour of functional exercise three to four months postoperatively. Benefits of treatment were no longer evident at one year.

CONCLUSIONS:

Interventions including physiotherapy functional exercises after discharge result in short term benefit after elective primary total knee arthroplasty. Effect sizes are small to moderate, with no long term benefit.

Comment in

J Clin Rheumatol. 2005 Dec;11(6):303-10.

Effects of kinesthesia and balance exercises in knee

osteoarthritis.

Diracoglu D1, Aydin R, Baskent A, Celik A.
Author information

Abstract

BACKGROUND:
In patients with knee osteoarthritis (OA), there is a prominent loss in proprioception and kinesthesia sensation compared with control subjects of the same age and gender.

OBJECTIVES:
The aim of this study is the investigation of short-term clinical effects of kinesthesia and balance exercises in patients with knee OA.

METHODS:
This 8-week study was conducted on 66 female patients with knee OA who were randomized into 2 groups. The first group received kinesthesia and balance exercises (such as retrowalking, walking on their toes, leaning to the sides, balance board exercises, minitrampoline exercises, plyometric exercises, and so on) in addition to strengthening exercises. The second group received only strengthening exercises.

RESULTS:
: Statistically significant improvements were observed postexercise for both groups with respect to baseline for WOMAC, SF-36 Form, times for performing activities of daily living, isokinetic quadriceps muscle strength, and proprioceptive sensation levels. In the first group with kinesthesia training, compared with the second group, significantly greater improvements were obtained in all the subparameters that measure functional status (WOMAC-physical function value, SF-36 Form [physical function, role limitations-physical and vitality-energy or fatigue variables], 10 stairs climbing, and 10-m walking times) and in isokinetic muscle strength at high angular velocities ($P < 0.05$). The absolute angular error percentage (to assess proprioceptive accuracy) was significantly improved postexercise in both groups. There were no differences between the groups.

CONCLUSIONS:
Additive positive effects of kinesthesia and balance exercises in knee OA have been demonstrated. Used in clinical applications, they should be able to increase the functional capacities of patients. Long-term studies about efficacy and cost-effectivity of these exercises are needed.

PMID: