Is exercise effective treatment for osteoarthritis of the knee?

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Authors' objectives
To review and determine the effectiveness of exercise treatment for osteoarthritis of the knee.

Searching
The author searched MEDLINE from June 1966 to January 2000 using the following MeSH terms and textwords: 'osteoarthritis' or 'arthritis' and 'knee', 'exercise', or 'physical training'. The reference lists of relevant review articles and trials were screened to identify additional studies. Only published reports were included; there were no language restrictions reported.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were included.

Specific interventions included in the review
Exercise treatment, defined as a range of activities to improve strength, range of motion, endurance, balance, coordination, posture, motor function or motor development. The treatments could be performed actively, passively or against resistance. Additional interventions were allowed. Studies were excluded if they concerned peri-operative exercise treatment, or if the intervention groups received identical exercise treatment and, therefore, no contrast existed between the intervention groups.

Participants included in the review
Patients with osteoarthritis of the knee, assessed using either clinical or radiological criteria, or a combination of both.

Outcomes assessed in the review
Pain, self-reported disability, observed disability or patient's global assessment of effect.

How were decisions on the relevance of primary studies made?
The author does not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
No formal assessment of quality was undertaken. The author has listed methodological limitations of the included studies.

Data extraction
The author does not state how the data were extracted for the review, or how many of the reviewers performed the data extraction. Data were extracted for the categories of: study identification, study design, intervention group, duration of sessions, length of treatment, intensity, and the outcomes of pain, disability and walking.

It is unclear whether all the study details are shown in the review's data extraction table.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative discussion organised around the specific outcome measures of pain, disability and walking.
How were differences between studies investigated?
The author does not state a method for assessing any differences between the studies.

Results of the review
Seventeen RCTs, reported in 18 publications, were included in the review. It is unclear whether all the study details are shown in the review's data extraction table. It was not possible to calculate the total number of participants in these studies.

It was not possible to obtain evidence on the content of exercise interventions, as studies were hampered by lack of attention to proper concealment, reporting of adverse effects, and long-term effects of exercise treatment. The lack of standard outcome measures was also noted. The results from trials comparing effects of different exercise treatment programmes were inconclusive.

Pain (14 trials): a small to moderate beneficial effect of exercise treatment was found for pain in knee osteoarthritis. This effect was found in participants with mild or moderate osteoarthritis, recruited from both community and clinic, who were being treated with various types of exercise treatment for at least 8 weeks.

Self-reported disability (6 trials): there was evidence for a small beneficial effect of exercise on self-reported disability. This effect was found in participants with mild or moderate osteoarthritis, recruited from both the community and the clinic, who were being treated with various types of exercise.

Walking (8 trials): the evidence indicated a small beneficial effect of exercise treatment on walking performance, and one trial showed a significant effect on both self-selected speed of walking and stepping, both clinically-relevant functional outcomes as recommended by OMERACT (see Other Publications of Related Interest).

Patient global assessment of effect (2 trials): evidence indicated that there is a need for future studies to integrate the beneficial effects of exercise according to the patients' global assessment.

Authors' conclusions
The author states that the available evidence indicates beneficial short-term effects of exercise treatment in patients with osteoarthritis of the knee. However, the number of available studies is limited, and more research is needed to expand this recommendation.

CRD commentary
The author stated a clear research question, although the inclusion and exclusion criteria were poorly reported. The literature search was limited to one database and included only published studies. There was no assessment of publication bias and additional relevant studies may have been missed.

The quality of the included studies was not formally assessed, but the author has listed methodological limitations of the included studies and discussed their implications for the results of the review. The author has not reported how the articles were selected or who performed the selection and data extraction, or the validity assessment.

The data extraction was reported in a table but it is unclear whether this table included all of the studies included in the review. The method for combining the studies was not reported; only the summary of grouped results was given in a narrative discussion.

It is unclear how the data were synthesised so it is not possible to comment on whether the results were accurately reflected in the conclusions. The conclusions should, therefore, be viewed with caution due to the methodological limitations and omissions described.

Implications of the review for practice and research
Practice: The author states that doctors should, at present, recommend exercise to all patients for the treatment of mild...
or moderate osteoarthritis of the knee.

Research: The author states that additional trials are needed and they should provide information on adherence, home-based interventions, interaction with pharmacological treatments, functional outcomes measures relevant to exercise treatment in these patients, and long-term effects.

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Other publications of related interest

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.