Effectiveness of physical activity interventions for older adults: a review
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Authors' objectives
To evaluate the effectiveness of physical activity interventions among older adults.

Searching
MEDLINE, Current Contents, CINAHL, ERIC, PsycLIT, a social sciences database and the Cochrane Library were searched from 1985 to August 2000. The keywords used included combinations of 'exercise', 'physical activity', 'elderly', 'older adults', 'middle aged', 'randomized controlled trial', 'intervention', 'adherence', 'compliance', 'participation' and 'effectiveness'. The reference lists of selected studies and of existing reviews were examined. Studies that were not published in English or Dutch were excluded.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) with an intervention group of 10 or more participants were included.

Specific interventions included in the review
Only studies with an intervention consisting of an exercise programme or aimed at promoting physical activity (e.g. information and counselling) were included. The included studies consisted of three different intervention types: home-based physical activity interventions with behavioural strategies for reinforcement; group-based physical activity interventions; and educational physical activity interventions in which an exercise programme was rarely included. The duration of the intervention ranged from 1.5 to 90 months.

Participants included in the review
Only studies where the average sample population was aged 50 years or above and the minimum age was 40 years were included. Studies were excluded where the intervention was aimed at participants with a diagnosed disease, such as rehabilitation interventions for cardiac or pulmonary patients.

The mean age of the participants in the included studies ranged from 51 to 88 years (mean 68; standard deviation, SD=10). Men were the minority in most studies (mean 29%, SD=29%); there were 11 studies consisting of women only and 3 of men only. Of the studies that reported ethnicity, the majority of the participants were white. Of the studies that reported education and income levels, the majority of the participants were relatively well educated and had moderate to high income levels. In most studies the participants were healthy inactive older adults from general community settings; in 5 studies the participants were living in a nursing or residential home; and in 5 studies the participants were using primary health care facilities.

Outcomes assessed in the review
The outcomes assessed were participation in the intervention and changes in physical activity levels over time. In the majority of studies, participation was defined as the participation rate, i.e. the number of exercise sessions or counselling sessions attended divided by the number of sessions prescribed. Ten studies defined participation as the number of participants exercising regularly or maintaining a minimum level of activity. For comparison purposes, the mean participation was only calculated for those studies that used participation rate for the outcome measure.

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

Assessment of study quality
The studies were evaluated on the basis of the following: characteristics of the participants; number of participants;
recruitment procedure; randomisation procedure; setting, type, intensity and duration of the intervention; use of behaviour modification strategies; and follow-up period. Two reviewers independently evaluated the studies. The authors do not state how any discrepancies were resolved.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

The extracted data included: author; year of publication; mean age plus SD; gender; physical activity targeted; frequency of activity (days/week); behavioural strategies; duration of the intervention; participation; effect on physical activity; and follow-up.

Methods of synthesis
How were the studies combined?
The RCTs were not sufficiently similar to allow for a statistical pooling of the results; these data were, therefore, summarised descriptively.

How were differences between studies investigated?
The studies were grouped according to the type of intervention (home-based, group-based or educational physical intervention) and the length of intervention. Short-term interventions were defined as less than one year; long-term interventions were defined as at least one year.

Results of the review
Thirty-eight RCTs comprising 57 interventions (n=16,376) were included.

Home-based physical intervention studies (n=9).

The mean participation rate was 90% (range: 86 to 93) for the short-term interventions and lower (range: 49 to 68%; mean not reported) for the long-term interventions. Participation ranged from 36 to 44% when based on the number of participants complying with the prescribed physical activity. Of the 2 studies reporting the outcome change in physical activity, one was a short-term intervention and the other was long-term. The short-term intervention study reported a decline in exercise activity 18 months after the intervention ended: 3.6 days/week versus 2.8 days/week. The long-term intervention study reported a decline in physical activity in both the intervention and control groups, with the decline being significantly larger in the control group.

Group-based physical intervention studies (n=38).

The mean participation rate was 84% (range: 55 to 100) for the short-term interventions and 75% (range: 63 to 84) for the long-term interventions. Four studies (2 short-term and 2 long-term interventions) comparing baseline and follow-up physical activity levels for the intervention group reported outcome levels that were significantly higher than baseline. Five studies (3 short-term and 2 long-term interventions) comparing control groups reported significantly higher physical activity levels in the intervention groups; 4 of these were the same studies reported for baseline to follow-up activity levels in the intervention group. Three studies (2 short-term and one long-term intervention) compared activity levels at the end of the intervention with levels after 12, 18 or 120 months. Only one of these studies reported significantly higher physical activity levels in the intervention group than in the control group.

Educational physical activity interventions (n=10).

The participation rates (attendance at one session) ranged from 35 to 87% (mean not stated) for short-term interventions, and from 47 to 96% (mean not stated) for long-term interventions. All of the studies reported on the outcome change in physical activity. The 6 short-term intervention studies reported a significant increase in physical activity in the intervention group than in the control group. Three of the 9 long-term interventions resulted in a significant improvement in physical activity levels.
Authors' conclusions
All three types of intervention can result in increased physical activity, but the changes are small and short-lived. The participation rates for home-based and group-based interventions were comparable, and both seemed to be unrelated to the type or frequency of physical activity. There was no evidence of a beneficial effect of behavioural reinforcement strategies.

CRD commentary
The authors set out a clearly defined review question with specified inclusion criteria. The literature search was reasonably comprehensive, although no attempt was made to identify unpublished research and only English and Dutch papers were included; this could result in some studies being missed. Publication bias was not assessed. Details of the review process, such as the number of reviewers selecting the studies and extracting the data, were not reported. There were some limitations in the reporting of the validity assessment. The authors specified a set of factors that were evaluated for each study, but the nature of this evaluation was unclear. The quality of the individual studies was unclear and the findings were not discussed in the context of study quality. Due to the variation in methodology and study participants, it was appropriate that the studies were not pooled in a meta-analysis. The studies were grouped in the narrative synthesis according to the type and length of intervention, which was appropriate. However, at times, the short- and long-term interventions were discussed together and this led to a lack of clarity.

The reviewers' conclusions follow from the results presented. However, the results may not be generalisable to all populations.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors state that there is a need for comparative studies evaluating the effectiveness of diverse interventions to initiate and maintain physical activity among older adults. Appropriate, valid and reliable measures of physical activity should be identified and used in future research, in order to increase comparability among studies.

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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.