Interventions to promote walking: systematic review
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CRD summary
This review evaluated the efficacy of interventions to promote walking. Interventions adapted to the requirements of the individual, targeted at the most sedentary or most motivated persons, and delivered at the individual, household, or group level seemed to effectively increase the rate of walking. This review was generally well conducted and its conclusions are likely to be reliable.

Authors' objectives
To review the efficacy of any intervention to promote walking in individuals or groups of people.

Searching
Twenty-five databases including MEDLINE and EMBASE were searched from 1990 onwards. No participant, study design, intervention, or language restrictions were applied. Twelve websites, reference lists of relevant studies and reviews, and the authors' own archives were searched, and experts in the field were contacted to identify additional studies. Further details of the search strategy were provided on the Internet.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) and non-randomised controlled experimental or observational studies were eligible for inclusion in the review.

Specific interventions included in the review
Studies of any type of intervention to encourage walking in general or walking as a mode of transport were eligible for inclusion. Eligible studies employed control conditions of no intervention, follow-up, or an intervention which was not intended to promote walking or which exceeded standard or usual care. Interventions in which the purpose, setting and outcome were all primarily clinical were excluded from the review. The included studies were of interventions delivered at the individual level through brief face-to-face advice by a health professional or through remote support by internet or telephone; interventions delivered at the group level through mentored meetings, led walks, educational sessions; or interventions at the community level using combined approaches. Some studies used pedometers alone or in combination with other supporting measures. The interventions to foster walking as a mode of transport included active travel, school travel initiatives and miscellaneous travel programmes. Follow-up ranged from 4 weeks to 10 years.

Participants included in the review
Studies involving any type of participant except for those focused on trained athletes or sports students were eligible. Participants included sedentary, inactive, low active and physically active individuals with or without medical co-morbidities. The participants belonged to various social backgrounds and included households, city residents, primary school students, students and employees.

Outcomes assessed in the review
All studies which reported a specific measure of walking at both baseline and follow-up were eligible for inclusion. The included studies employed a range of measures of the net change in walking. Secondary outcomes assessed the effects of the intervention on physical activity and health.

How were decisions on the relevance of primary studies made?
One reviewer performed study selection and a second reviewer checked all articles pending decision and 10% of articles excluded.

Assessment of study quality
Two independent reviewers performed the study quality assessment, with any disagreements resolved through discussion. Study validity was assessed using the criteria of randomisation, concurrent interventions, the
representativeness of the study populations, the comparability of the intervention and control groups, attrition bias, the sample size, the length of follow-up, and the appropriateness of the instrument used to quantify walking.

Data extraction
Two independent reviewers performed the data extraction, with any disagreements resolved through discussion. Data were extracted to calculate the net change in time spent on walking (minutes/week) for comparisons on efficacy between the trials.

Methods of synthesis
How were the studies combined?
The authors stated that the studies were too clinically heterogeneous to be pooled in a meta-analysis; a narrative synthesis was therefore employed. The studies were grouped by intervention. The estimated net increase in walking was plotted by ranking the studies by sample size and study validity.

How were differences between studies investigated?
Differences between studies were described in the narrative synthesis and were further apparent from the evidence tables.

Results of the review
Nineteen RCTs and 29 non-RCTs were included in the review.

Study quality.
Among the studies of interventions to promote walking in general, those evaluating brief advice to individuals met 5 to 7 quality criteria, those of group-based approaches 1 to 7 criteria, and investigations of community-based approaches 1 to 5 criteria. Among the studies assessing interventions on walking as a mode of transport, those that targeted or individualised the intervention met 2 to 6 quality criteria.

Interventions to promote walking in general (27 studies).
Interventions to promote walking in general were frequently directed at specific groups of individuals. The best results were obtained with sedentary individuals whereas less clear benefits were found for interventions targeted at clinical populations. Studies using brief advice or remote support, and studies of interventions at the community level all reported a significant increase in self-reported walking. For group-based approaches, such improvement was more consistent in RCTs than in non-RCTs. The use of pedometers seemed associated with a significant short-term increase in self-reported walking or step counts which was not, apparently, maintained in the long-term (3 studies).

Effects of interventions on walking as a mode of transport (21 studies).
The majority of the interventions to promote walking as a mode of transport were delivered only to highly motivated individuals or households. Interventions to encourage active travel (14 studies) as well as school travel initiatives were associated with a significant net increase in self-reported walking. Four non-randomised studies on various other transport measures reported conflicting results about the efficacy of the intervention.

The authors stated that successful interventions could lead to an overall 30 to 60 minutes/week mean increase in walking in general and a 15 to 30 minutes/week mean increase in walking as a mode of transport. These benefits seemed to be independent of demographic or socioeconomic group.

Seven studies reported an increase in walking and a parallel net increase in overall physical activity, or a reduction in risk factors, at final follow-up. None of these trials found significant differences between the intervention and control groups. Three of the 6 studies assessing health, well-being or quality of life found a significant overall difference between the intervention and control groups.

No study reported adverse effects attributable to any intervention to promote walking.
Cost information
The authors stated that information about costs was too limited, therefore costs were not considered in the analysis.

Authors' conclusions
Some interventions seemed to effectively increase walking, especially if tailored to the individual, targeted at the most sedentary people or at those most motivated to change, and delivered at the level of the individual, household or group. The effectiveness of interventions applied to workplaces, schools or communities was less clear.

CRD commentary
This review addressed a well-defined question in terms of the study design, intervention and outcomes, while a broad definition of participants was used. The search was extensive and employed no language restrictions. In addition the authors attempted to locate unpublished studies. These factors made it less likely that relevant studies were excluded from the review. The authors used appropriate methods to reduce bias and error in the data extraction and validity assessment, while some attempts to achieve this were made in the selection of studies for the review. Attempts were made to use the validity assessment to inform the conclusions of the review, but the method employed meant that no useful information was added. The authors' decision not to pool the data in a meta-analysis appears appropriate given the level of clinical heterogeneity in the identified studies. The authors' cautious conclusions appear appropriate and are likely to be reliable.

Implications of the review for practice and research
Practice: The authors stated that various approaches to increase walking should be made available.

Research: Further RCTs are needed to clarify the effectiveness of individualised marketing in increasing walking. Further studies of interventions on walking as a mode of transport and those delivered at the community level are also required. Additional studies should evaluate whether the increase in walking obtained with these interventions translates into any clinical benefit and is not paralleled by an increase in adverse events.

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Other publications of related interest


5. Alfonzo M. To walk or not to walk? The hierarchy of walking needs. Environ Behav 2005;37:808-36.

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**Record Status**
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