High-quality controlled trials on preventing episodes of back problems: systematic literature review in working-age adults

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CRD summary
This review concluded that exercise interventions are effective for preventing episodes of back problems in people of working age. There was no evidence for effectiveness of other types of intervention. The authors' conclusions appear reliable, although the clinical significance of the effect of exercise and the most appropriate type of intervention were unclear.

Authors' objectives
To evaluate the effectiveness of interventions to prevent back problems in adults of working age.

Searching
The authors searched MEDLINE (1991 to May 2007), EMBASE (1980 to May 2007), the Cochrane Back Review Group Specialized Trial Register (to August 2008) and reference lists of systematic reviews and recent articles. Search terms were reported. A literature search performed for the Agency for Health Care Policy and Research was used to identify articles published before 1991. Only studies published in peer-reviewed journals in English were included in the review.

Study selection
Prospective studies of interventions to prevent back problems (back symptoms or activity limitation caused by back pain or back-related limb symptoms (sciatica)) in adults aged 18 to 65 were eligible for the review. Interventions to limit disability in patients with existing back problems were excluded, as were studies of people with serious underlying spinal pathology or non-spinal causes of referred back pain. Studies had to be randomised controlled trials (RCTs) or non-randomised trials without obvious bias in treatment assignment and with comparable treatment groups at baseline, and had to meet a number of quality criteria (listed) to be included. Participants could be people with or without current symptoms or previous back problems, provided they were not actively seeking treatment or unable to work because of back problems at baseline. Studies had to report clinical or functional outcomes (not changes in anatomical or physiological measures or knowledge).

Interventions in included trials involved exercise, education, lumbar supports, shoe orthoses and programmes to reduce lifting load. Most trials recruited a mixture of participants with and without previous back problems but some involved only people with a previous history of back problems.

Three reviewers independently selected studies for the review.

Assessment of study quality
In addition to the requirements for inclusion in the review, methodological quality was assessed using 11 criteria developed by the Cochrane Collaboration Back Review Group. Studies were given a quality score based on the number of criteria met. Studies scoring 6 or more out of 11 were considered high-quality.

Two reviewers independently assessed validity and disagreements were resolved by consensus.

Data extraction
For continuous outcomes, data on group means and standard deviations were used to calculate the effect size (mean difference). For dichotomous outcomes, data on numbers of participants and events in each group were used to calculate the rate ratio. Statistical significance and direction of effect was extracted for each outcome.

The authors did not explicitly state how the data were extracted or how many reviewers performed the data extraction.
Methods of synthesis
Studies were synthesised narratively by type of intervention. Differences between studies were discussed in the text and presented in tables.

Results of the review
Twenty trials with 25,644 participants at baseline were included, of which 17 were randomised controlled trials (RCTs); five of the RCTs were cluster-randomised. Quality scores ranged from 6 to 9 out of 11, but only three trials had adequate allocation concealment. The number of participants was unclear.

Seven out of eight trials of exercise reported that the intervention significantly reduced self-reported back problems compared with the control group over eight to 13 months of follow-up. Significant effect sizes ranged from 0.39 to 0.69, indicating a small to moderate effect. None of the trials of other interventions reported a significant difference between the intervention and control groups.

Authors' conclusions
Exercise interventions are effective and other interventions are not effective for preventing episodes of back problems in working age adults.

CRD commentary
Inclusion criteria for participants, interventions and outcomes were clear. Studies had to meet a number of design and quality criteria for inclusion, limiting the review to generally high-quality studies (although not all were RCTs). The search covered a range of relevant sources, but limiting inclusion to published articles in English could have introduced publication or language bias. Risk of publication bias was not evaluated. Validity was assessed using appropriate criteria and the results were used in the synthesis. Extensive details of included studies were presented in tables. Appropriate methods were used to minimise reviewer errors and bias in study selection and validity assessment, although it was not explicitly stated whether similar methods were used for data extraction. A narrative synthesis was appropriate in view of the wide range of interventions and outcomes included.

The authors' conclusion that exercise can reduce episodes of back problems reflects the evidence presented and appears reliable, although the clinical significance of the effect and the most appropriate type of intervention were not clear. There was no evidence for other types of intervention but the conclusion that these interventions are not effective may be overstated.

Implications of the review for practice and research
Practice: The authors stated that resources for preventing episodes of back problems should be devoted to interventions already proven by high-quality controlled trials. New prevention approaches should be tested in well-designed controlled trials before being implemented.

Research: The authors stated that there is a need for high-quality trials using functional outcomes such as absence from work.

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