Efficacy of comprehensive rehabilitation programs and back school for patients with low back pain: a meta-analysis

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Authors' objectives
To conduct a meta-analysis to synthesise existing evidence on back schools from a global perspective, encompassing issues of efficacy in reducing pain, physical impairment and disability and also long-term effects associated with back schools. In addition, category-specific analyses were undertaken to investigate the efficacy of back schools in the following comparisons: comprehensive rehabilitation programs versus back school as primary intervention; inpatient versus outpatient programmes; chronicity of patient population and variation in outcome with respect to study's country of origin.

Searching
A computer-assisted search of Index Medicus from 1976 to 1994 was undertaken (the search terms were given in the paper). The references of the retrieved studies were also checked.

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

Specific interventions included in the review
Studies addressing the use of back schools to treat lower-back pain. These included patient education for proper bending and lifting activities (body mechanics education) and the implementation of a passive or active back exercise programme. Comprehensive rehabilitation programmes were defined as interventions that coupled the minimal essential elements of back school (above) with a worksite visit, operant conditioning, cognitive-behavioural group therapy or an intensive physical training regimen that supplemented traditional back exercise programmes.

Participants included in the review
Patients with lower-back pain: those showing symptoms for 8 weeks or less were defined as being in the acute/subacute stage (n = 630, 27%, whilst those showing symptoms for longer than 8 weeks were defined as in the chronic phase (n = 1,263, 53%). Some studies had mixed chronicity (both categories, n = 480, 20%). Ages of subjects varied from 18 to 61 years (mean age 41.8 years, SD 5.5). Of the 1,913 patients whose sex was stated, 55% were male.

Outcomes assessed in the review
The outcome categories included in the review were pain (e.g. measured with visual analogue scale), disability (e.g. scored tests of activities of daily living), spinal motion (e.g. range of motion of the spine), strength/endurance (e.g. isokinetic assessment), work/vocational (e.g. amount of sick leave) and educational/compliance (e.g. measure of the quality of exercise performance at follow-up).

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

Assessment of study quality
The author does not state that they assessed validity.

Data extraction
The data were extracted by the author, but not in a blind fashion.
Methods of synthesis
How were the studies combined?
The overall efficacy was estimated by the effect size index (d-index), which is the difference between two groups in terms of the control group standard deviation. A positive d-index indicates that the back school group performed better than the control or comparison group. Effect sizes were estimated on the basis of means and standard deviations (SD), t- and F-ratios, or the significant level and sample size when means and SDs were not reported. Non-parametric statistics and percentages were converted to effect size. The d-index was further converted to a U3 value, which indicates the percentage of scores in the control group that were exceeded by the mean score in the back school group.

How were differences between studies investigated?
Levine's F-test for homogeneity of variance was conducted for each stratification variable, in each of the category-specific analyses, due to the variation in the treatment procedures used in the back schools and the methods used to assess outcomes.

Fixed-effect factorial design analyses of variance (ANOVAs) were used to evaluate the differences between effect sizes for the above specified categories and across the types of outcome measures. Post hoc tests (Tukey's studentised range test) were used to evaluate ANOVAs comparing more than 2 means.

Results of the review
Nineteen studies were included in the global meta-analyses involving 2,373 patients in total. In terms of the category-specific analyses: (1) 6 studies dealt with acute/subacute patients, 10 with chronic patients and 3 with mixed patients; (2) 11 programmes were classified as comprehensive and 8 as back school specific; (3) 12 studies looked at outpatients, 2 at inpatients and 5 at inpatient/outpatient groups; (4) 15 studies were from Scandinavia or the Netherlands and 4 studies came from 'other countries' (United States, Canada, England and Israel).

Heterogeneity tests for effect size variance were significant for at least one outcome measure for the comprehensive versus primary back school category, and for the Scandinavian versus 'other' category, suggesting that the d-indexes came from different populations of patients with lower-back pain.

The mean overall d-index was 0.07 (SD, 0.73). The average performance of subjects in the back school groups was better than only 52.8% of the subjects in the control groups. The average effect size for comprehensive rehabilitation programs that included back school (d=0.28, SD 0.33) was larger than the average effect size for programmes that offered back school as the primary intervention (d=-0.14, SD 0.92). When stratified by outcomes and programs, the d-index was 0.26 (SD 0.31) or -0.08 (SD 0.87) with pain, 0.15 (SD 0.14) or 0.18 (SD 0.85) with disability, 0.25 (SD 0.29) or 0.00 (SD 0.66) with spinal mobility, 0.54 (SD 0.35) or 0.4 (SD 0.42) with strength/endurance, 0.14 (SD 0.31) or -0.02 with work/vocational, and 0.27 (SD 0.37) or 0.27 (SD 0.35) with education/compliance.

Authors' conclusions
Back schools were most efficacious when coupled with a comprehensive rehabilitation programme. Efficacy was supported for the treatment of pain and physical impairments and for education/compliance outcomes. Work/vocational and disability outcomes were not improved substantially beyond control levels.

CRD commentary
The author failed to draw appropriate conclusions from the results of meta-analysis. The general conclusion should be that back school generally yields no benefit beyond that found for control or comparison interventions. The conclusion that a comprehensive programme is better than back school alone is based mainly on between-study comparisons, and should be confirmed by further trials in which patients are randomly allocated into groups receiving a comprehensive programme or back school as the primary intervention. The interventions in the control groups were not described in detail.

Implications of the review for practice and research
The value of back school for patients with lower-back pain has not been substantiated.

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