Self-management programs for chronic musculoskeletal pain conditions: a systematic review and meta-analysis

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CRD summary
The review found a small to moderate beneficial effect of self-management programmes on pain and disability in adults with arthritis but insufficient evidence in patients with chronic back pain. The authors’ conclusions seem appropriate for chronic back pain but those for arthritis should be treated with some caution given the possibility of review bias and the short-term evidence.

Authors’ objectives
To assess the effects of self-management programmes on pain and disability in patients with chronic musculoskeletal pain conditions.

Searching
MEDLINE and EMBASE were searched from the 1970s to March 2010. The search strategy was reported. Bibliographies of identified studies were handsearched. It appeared from the flow chart that the authors restricted the search on the basis of language but no further details were provided.

Study selection
Eligible studies were peer-reviewed randomised controlled trials (RCTs) of adults aged 18 years or older with chronic musculoskeletal pain conditions lasting for more than three months in which a self-management programme was compared with usual care or waiting list control. Primary outcomes were pain intensity and disability. Eligibility intervention criteria integrated systematic therapies into a self-management or self-care programme primarily focused on managing pain and minimising disability. Self-management education studies that involved exclusively physical or psychological therapies were not eligible.

In the included studies, participants had arthritis, chronic knee pain or pregnancy-related low back pain or chronic back pain. Studies were published between 1985 and 2009 and were community based and close to home. Participants’ age ranged from over 50 to a mean age of 77.7 years (where reported). One study included pregnancy-related low back pain so the participants were presumably younger. The interventions were broad and included one or more of group sessions, individual sessions, exercise classes, written materials or internet-facilitated support delivered by professional or lay leaders. Group sessions were delivered between six and 12 times and ranged from 0.5 to 2.5 hours. Where reported, the behavioural model underlying the intervention was cognitive-behavioral theory, social cognitive theory or self-efficacy theory. Control groups were waiting list controls, usual care, no treatment or a minimal part of the intervention. Details of interventions and controls were given in the review. Intervention duration ranged from six weeks to 18 months; most were less than two months. Most studies were conducted in North America and Europe and one was in Asia. Pain was most frequently measured using a visual analogue scale (VAS) or visual numeric scale (VNS). Arthritis-related disability was measured using the Health Assessment Questionnaire (HAQ) disability scale.

One reviewer screened all potentially eligible studies and a second reviewer independently screened a proportion of these. Two reviewers independently screened the full-text articles for inclusion. Disagreements were resolved by contacting the authors of the articles or through consensus and, where needed, discussion with a third reviewer.

Assessment of study quality
Study quality was evaluated using the Cochrane risk of bias tool for random allocation, allocation concealment, blinding of outcome assessors, drop-out/attrition, intention-to-treat analysis and baseline comparability. Each item was rated as met, unmet or unclear. Studies were excluded if one or more criteria were not met. Included studies were graded as A (all criteria met, low risk of bias) or B (one or more criteria partially met, moderate risk of bias).

Two reviewers independently assessed the study quality; disagreements were resolved through consensus or, where needed, discussion with a third reviewer.
Data extraction
Relevant data, including means and standard deviations of the outcomes scores, were extracted onto a standardised data extraction form. Outcome measures were defined as mean change from baseline to follow-up and categorised as short term (up to 12 weeks), medium term (13 to 26 weeks) or long term (over 26 weeks). Where the standard deviation of an outcome score was not available it was estimated according to Cochrane review methodology.

Two reviewers independently performed data extraction. Discrepancies were resolved through consensus.

Methods of synthesis
Meta-analyses were performed using all time points meta-analysis to estimate the trend of effectiveness of self-management programmes on pain and disability over the time. Results were reported separately for each outcome. Statistical heterogeneity was assessed using $\chi^2$ and $I^2$ tests. Fixed-effect models were used unless there was significant heterogeneity in which case random-effects models were used. Weighted mean differences (WMD), standardised mean differences (SMD) and effect sizes (<0.2 small, 0.2 to 0.5 moderate, >0.5 large) with 95% confidence intervals (CI) were estimated.

Where measures of outcomes were disparate across studies results were combined in a narrative synthesis.

Results of the review
Nineteen trials (more than 7,000 participants) were included in the review. Studies ranged in size from 51 to 1,090 patients. Follow-up ranged from two months to three years. Compliance ranged from 56% to 97%. Attrition rates ranged from 4% to 43%. Five studies were classified as having a low risk of bias and 14 as having a moderate risk.

Among patients with arthritis, self-management programmes were associated with a moderate reduction in pain intensity compared with control group at four months (SMD -0.23, 95% CI -0.36 to -0.10; seven trials) and six months (SMD -0.29, 95% CI -0.41 to -0.17; three trials). The effect was smaller at 12 months (SMD -0.14, 95% CI -0.23 to -0.04; three trials). There was a moderate degree of heterogeneity at four months ($I^2=60\%$) but none at later follow-up points ($I^2=0\%$ for both). A further five studies which were not included in the meta-analysis showed inconsistent findings.

Self-management programmes were associated with no change in disability in patients with arthritis as measured by HAQ at four months (five RCTs) and a small reduction in disability at 12 months (SMD -0.17, 95% CI -0.27 to -0.07; three trials; no statistical heterogeneity, $I^2=0\%$). Eight studies were reported narratively; three showed significant and five showed non-significant findings.

No meta-analysis was performed for chronic back pain due to differences in outcome measurement. None of the three RCTs showed beneficial effect of self-management programmes in reducing back pain. There was no consistent pattern in the effect of these programmes on improving disability.

Few adverse events were reported but in two trials a small number of participants reported that pain became worse with exercise in patients in the self-management groups.

Authors' conclusions
Self-management programmes had a small to moderate effect in reducing pain within one year in patients with arthritis. They had a non-significant medium term effect and a small long-term effect in improving arthritis-related disability. There was insufficient evidence to illustrate the effectiveness of self-management programmes on pain intensity and disability in chronic back pain.

CRD commentary
The study addressed a clear question. Inclusion criteria were specified but it is not clear how the intervention criteria were operationalised. Two relevant databases were searched. No mention was made of any attempts to locate unpublished data so the results may have been affected by publication bias. Attempts were made to reduce error and bias during most of the review process but it was not clear exactly how many participants were included in the review. The review excluded studies of low quality but the authors stated that the included studies still had methodological flaws. Details of the interventions and other study details were included in the review.
No details of the all time-points meta-analysis was given. Although the authors did decide to not include some studies in the meta-analysis because of heterogeneity it was unclear how appropriate it was to pool the results. The authors acknowledged that there was a small number of studies for some meta-analyses and few medium and long-term studies. Other limitations included use of a self-reported outcome measure for disability and a lack of clarity regarding whether patients received any other interventions.

The authors’ conclusions reflected the evidence and seem appropriate for chronic back pain. Conclusions relating to arthritis should be treated with some caution given the possibility of review bias and limitations of the evidence.

**Implications of the review for practice and research**

**Practice:** The authors recommended provision of self-management programmes to adult patients with arthritis in community settings.

**Research:** The authors stated a need for further research on the efficacy of self-management programmes for improving pain and reducing disability in chronic back pain.

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