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## Effective delivery styles and content for self-management interventions for chronic musculoskeletal pain: a systematic literature review

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### CRD summary

The review concluded that shorter duration interventions delivered to groups of patients with chronic musculoskeletal pain, with healthcare professional input, potentially produced better outcomes. Evidence on the effectiveness of different intervention components was mixed. Given the limitations of the evidence, selected outcome reporting, and small treatment effects, the authors' conclusions may not be reliable.

### Authors' objectives

To assess the effectiveness of different multi-component self-management interventions for chronic musculoskeletal pain.

### Searching

Seven electronic databases (including MEDLINE, EMBASE and The Cochrane Library) were searched between 1994 and April 2009. Searches were restricted to peer reviewed published English language articles; search terms were reported. In addition, reference lists of relevant reviews were manually searched.

### Study selection

Eligible for inclusion were randomised controlled trials (RCTs) that compared the effectiveness of multi-component self-management interventions to improve patient health or quality of life versus waiting list or usual care. Self-management interventions had to focus on at least two of the following elements: psychological, mind-body therapies, physical activity, lifestyle and pain education. Eligible studies were in adults (18 years or older) with chronic (duration longer than three months) musculoskeletal pain. Studies had to report valid and reliable evidence on outcomes of interest: pain intensity, physical function, general mental health, depression, anxiety, social function, healthcare use, global health measures, self-efficacy and quality of life. Studies were excluded if they included patients with rheumatoid arthritis, passive interventions, and studies of patients with mixed chronic conditions if less than 80% of patients had chronic musculoskeletal pain.

Included studies were conducted in North or South America, Europe, Asia and the Middle East. Studies were in patients with osteoarthritis, low back pain, fibromyalgia or mixed chronic pain conditions. Where reported, the mean age of patients was 55 years and 72% of patients were female. Interventions were delivered to groups and/or individuals, or remotely over a duration of four days to 52 weeks, with most lasting eight weeks or less. Most studies provided interventions through a health care professional, but some were delivered by lay persons. Over half of included studies delivered interventions within a medical setting, with most of the remaining studies delivering interventions in a community setting. Most of the self-management interventions assessed within the included studies included at least three of the components listed as part of the eligibility criteria (previous paragraph).

Two reviewers screened studies for inclusion and discrepancies were resolved through arbitration to a third reviewer.

### Assessment of study quality

Two reviewers assessed study risk of bias according to Cochrane methods, including criteria on randomisation, allocation concealment, attrition, blinding and intention-to-treat. Studies meeting four criteria or more were considered high quality, those meeting three or less were considered lower quality.

### Data extraction

Final value data and change from baseline scores were extracted for each outcome to calculate mean differences and 95% confidence intervals. The authors did not state how many reviewers performed the data extraction.

### Methods of synthesis

A random-effects model was used to calculate standardised mean differences (SMDs) and 95% confidence intervals

(CIs). Results were grouped by follow-up duration (short-term less than four months, medium-term four to eight months, and long-term more than eight months). Data were also grouped by intervention characteristics (course delivery mode, course leader, course setting, duration) and intervention elements (as noted above). Cohen's *d* was used to interpret effect sizes; less than 0.2 was minor, 0.2 to 0.5 small, 0.5 to 0.8 medium and 0.8 or greater was large.

Statistical heterogeneity was assessed using  $X^2$  and  $I^2$ ;  $p < 0.05$  and  $I^2$  50% or greater indicated substantial to considerable heterogeneity.

Sensitivity analyses were conducted to remove studies with more than one type of self-management intervention arm (as this meant control groups were double counted). Analyses were also conducted for high and low quality RCTs and studies using final value data and change from baseline data.

Publication bias was assessed using funnel plots.

### **Results of the review**

Fifty-three RCTs (11,170 participants) were identified with 46 RCTs (8,539 participants; range 50 to 855) that provided final value data were included in the review. Thirty-six RCTs met three or less quality criteria and were considered lower quality. Ten RCTs met four or five criteria and were considered high quality.

The authors appeared to report results on outcomes for a selected number of comparisons based on intervention characteristics and components. Online supplementary data report outcomes for other comparisons, but no further details on the characteristics of these comparisons were provided. Most of these comparisons showed no statistically significant or only minor detectable significant differences between intervention and control groups, and many comparisons were not estimable because there were no data.

Treatment duration: treatment duration of less than eight weeks (34 RCTs) showed greater benefit compared to durations lasting more than eight weeks (12 RCTs). Duration less than eight weeks showed statistically significant benefit or minor differences between self-management and control in the short, medium, and long-term for pain intensity, physical function and self-efficacy.

#### Psychological component

Thirty-eight RCTs compared a self-management intervention that included a psychological component versus a control. Eight RCTs compared a self-management intervention that did not include a psychological component versus a control. Interventions including a psychological component showed evidence of benefit in the short and medium-term for pain intensity, physical function and self-efficacy when compared to controls; all reported small effect sizes.

#### Lifestyle component

Statistically significant benefits were shown for interventions with (39 RCTs) and without lifestyle components (seven RCTs) in the short and medium term for all outcomes except depression. Effect sizes were minor or small in RCTs including a lifestyle component. For RCTs without a lifestyle component, effects sizes were small for six outcome comparisons and medium for two outcome comparisons.

#### Pain Education component

For most outcomes, similar findings were reported in the short term whether the intervention included a pain education component (35 RCTs) or not (11 RCTs). In the medium term there was evidence in favour of RCTs including a pain education component; one minor effect (physical function), three small effects (pain intensity, self-efficacy and depression) and one medium effect (global health).

#### Physical Activity component

Forty RCTs included a physical activity component, four RCTs did not. There was evidence of greater benefit in RCTs with a physical activity component compared to RCTs without this component. Trials with this component showed small effect sizes in the short term for all outcomes except depression, in the medium and long term effects were minor

or small. Trials without the component showed one small and medium effect in the short term.

#### Mind Body Therapy component

Most benefit was seen for interventions without a mind body component (20 RCTs); one minor effect (physical function; medium term), eight small effect sizes (all short term outcomes except depression; pain intensity and self efficacy in both medium and long term) and one medium effect size (self efficacy; medium term).

Sensitivity analyses showed some evidence of reduced effect size in high quality trials compared to low quality trials, but did not significantly differ from the overall results. Removal of studies with more than one intervention arm did not significantly alter the results.

Results from other subgroup analyses were reported in the review. There was no evidence of publication bias.

#### **Authors' conclusions**

Interventions delivered to groups with healthcare professional input had potential to produce better outcomes than other types of interventions. Longer intervention durations did not necessarily result in better outcomes. Evidence on the effectiveness of different intervention components was mixed.

#### **CRD commentary**

The review question and inclusion criteria were clearly stated. Several databases were assessed but as the search was restricted to peer reviewed publications in English, there may have been potential for publication and language bias. Study selection and quality assessment were performed in duplicate but it was unclear whether this was true for data extraction, which meant reviewer error and bias could not be ruled out. The authors acknowledged that few trials were considered high quality.

Given the nature of the evidence, it was unclear whether meta-analyses were appropriate. The authors did not report data from studies looking at change from baseline scores as they considered the data to be insufficient. It may have been useful if these data had been presented in some format. The authors acknowledged that data were sparse for some outcomes which made it difficult to ascertain the influence of intervention characteristics. They also acknowledged that results for individual intervention components were largely inconclusive as there was a paucity of studies without the particular components to compare against. Consideration should also be given to the fact that the comparisons between delivery methods and intervention components were indirect which reduced the robustness of the findings, and that only certain outcome comparisons were reported in detail.

Given the limitations of the evidence, selected outcome reporting, and the small treatment effects reported, the authors' conclusions should be treated with caution as they may not be reliable.

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

Practice: The authors stated the evidence provides useful information to clinicians deciding what type of self-management approach might help patients with chronic musculoskeletal pain. They suggested that serious consideration should be given to the development of short, group, and healthcare professional led interventions.

Research: The authors stated that there was a need for further research to explore and identify the interactions and effects of multi-component therapies and complex interventions, and assess intervention cost-effectiveness. They also recommended that future research reports intervention duration, attrition, and actual exposure to the intervention and changes scores as opposed to final values.

#### **Funding**

National Institute for Health Research.

#### **Bibliographic details**

Carnes D, Homer KE, Miles CL, Pincus T, Underwood M, Rahman A, Taylor SJ. Effective delivery styles and content for self-management interventions for chronic musculoskeletal pain: a systematic literature review. *Clinical Journal of Pain* 2012; 28(4): 344-354

**PubMedID**

22001667

**DOI**

10.1097/AJP.0b013e31822ed2f3

**Original Paper URL**

[http://journals.lww.com/clinicalpain/Abstract/2012/05000/Effective\\_Delivery\\_Styles\\_and\\_Content\\_for.11.aspx](http://journals.lww.com/clinicalpain/Abstract/2012/05000/Effective_Delivery_Styles_and_Content_for.11.aspx)

**Indexing Status**

Subject indexing assigned by NLM

**MeSH**

Chronic Pain /therapy; Databases, Bibliographic /statistics & numerical data; Humans; Musculoskeletal Pain /psychology /therapy; Outcome Assessment (Health Care); Patient Education as Topic /methods; Psychotherapy; Randomized Controlled Trials as Topic; Self Care

**AccessionNumber**

12012021593

**Date bibliographic record published**

29/08/2012

**Date abstract record published**

14/02/2013

**Record Status**

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