Meta-analysis of the effect of psychoeducational interventions on pain in adults with cancer

Devine E C

CRD summary
This review assessed psychoeducational interventions for pain in adults with cancer. The author concluded that psychoeducational interventions may be helpful as an adjunctive treatment to analgesia, but should not be used to replace analgesia. The evidence presented appears to support the author's conclusions, but limitations in the review process mean that the results may not be reliable.

Authors' objectives
To assess the effects of psychoeducational interventions for pain in adults with cancer.

Searching
CINAHL, PubMed, Dissertation Abstracts International, PsycLIT and the Cochrane Database of Systematic Reviews were searched; the keywords were listed. The reference lists in relevant studies and reviews were also checked.

Study selection
Study designs of evaluations included in the review
Experimental, quasi-experimental and pre-test post-test studies were eligible for inclusion if each treatment group contained at least 5 patients, and the treatment groups were selected from the same setting and were comparable. The review classified treatment groups as not comparable if the ES between treatment groups was one or more on pre-test scores, or if the ratio of the standard deviations for the treatment and control groups was less than 0.25 or greater than 4.

Specific interventions included in the review
Studies of psychoeducational interventions were eligible for inclusion. In the review, the term 'psychoeducational' encompassed educational, psychosocial and cognitive-behavioural interventions. Studies that only compared psychoeducational interventions with pharmacological interventions were excluded.

The included studies were of educational interventions, cognitive-behavioural coping strategies, nonbehavioural-noncognitive support or counselling interventions, and combinations of these types of intervention. The educational interventions were usually concerned with pain and its treatment. The cognitive-behavioural coping strategies were mostly relaxation interventions including at least one of the following elements: progressive muscle relaxation, guided imagery, self-selected music, or hypnotherapy. The comparator in the controlled trials was usual care or an alternative treatment. Where reported, the studies were conducted exclusively in in-patient hospital facilities, exclusively in the home, or in a combination of settings.

Participants included in the review
Studies of adults with cancer were eligible for inclusion. The average age of the participants in the included studies, where reported, ranged from 33 to 77 years. Most of the studies involved more women than men. The studies included patients with various types of cancer: breast cancer, haematological malignancy, gynaecological malignancies and mixed types of cancers. The levels of baseline pain varied across the included studies. Further details were given in the paper.

Outcomes assessed in the review
Studies that reported an effect size (ES) for self-reported pain were eligible for inclusion. Studies that only reported pain using provider-rated measures were excluded. Most of the included studies measured pain shortly after the intervention (range: 1 hour post-intervention to 52 weeks) by verbal report or written questionnaire (McGill Pain Questionnaire or visual analogue scale).

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

**Assessment of study quality**
Validity was assessed on the basis of random assignment, the presence of a floor effect, measurement reactivity and the presence of the Hawthorne effect. Studies in which pain was reported to someone other than the treatment provider were classified as having lower measurement reactivity. The review defined higher quality studies as those that used random assignment, had no documented floor effect on pain, and data collection was other than by verbal report to the treatment provider. The author did not state who performed the validity assessment.

**Data extraction**
The author did not explicitly state how many reviewers performed the data extraction, but the percentage agreement on the coding of outcomes between reviewers was reported, thus implying that this process was done in duplicate. The extracted data included characteristics of the intervention, setting, participants, outcome measures, attrition and results. The standardised mean difference between treatment groups (Cohen's d) was calculated and the effect for small sample size was adjusted for each included study. Where appropriate, adjustments were made to account for pre-treatment differences between the groups.

**Methods of synthesis**
How were the studies combined?
The studies were combined in a meta-analysis. The characteristics of the included studies were summarised in the text of the review under the headings of study, participant, setting, treatment and threats to validity. The ESs were weighted by the inverse of the variance and pooled across studies to calculate an overall ES and 95% confidence interval (CI). Studies that were heterogeneous were combined in a narrative. In the review, ESs of 0.2, 0.5 and 0.8 were considered small, medium and large, respectively. Publication bias was assessed by examining the relationship between the ES and the form of publication.

How were differences between studies investigated?
Statistical heterogeneity in the meta-analyses was assessed using the Q statistic. A fixed-effect weighted regression was used to assess the relationship between ES and threats to study validity. Separate meta-analyses were conducted for relaxation-promoting cognitive-behavioural interventions, educational interventions, relaxation plus other interventions, and supportive counselling plus other interventions. Higher quality studies were analysed separately for all interventions and within each category of treatment. Within the relaxation-promoting cognitive-behavioural intervention category, separate analyses were conducted for studies of relaxation exercises plus guided imagery, relaxation exercises plus guided imagery plus hypnosis, and relaxation alone.

**Results of the review**
Twenty-five studies were included: 21 randomised controlled trials (RCTs), 2 non-randomised controlled trials and 2 pre-intervention post-intervention studies. The author stated that 1,723 patients were included in the review. However, tabulated data were available for only 1,695 patients (sample size range: 6 to 313).

Threats to validity: there was a significant relationship between ES and the method used to assign patients to the treatment groups (ES lower in RCTs, P<0.05), measurement reactivity (ES lower where there was lower measurement subjectivity, P<0.05), and the presence of a floor effect on pain (ES lower where a floor effect was present, P<0.05). Fewer non-randomised trials had higher measurement reactivity than RCTs (P<0.05). No significant relationship was found between ES and publication bias, or between ES and the presence of a placebo or alternative treatment.

The pooled analysis of all studies showed that the interventions had a moderate-sized significant effect on pain (ES 0.41, 95% CI: 0.29, 0.52).

The ES was smaller but still statistically significant when only higher quality studies were analysed (ES 0.36, 95% CI: 0.15, 0.58).
Relaxation-promoting cognitive-behavioural interventions (12 studies): these were associated with a statistically significant moderate to large effect on pain improvement (ES=0.65). No statistically significant heterogeneity was found. An analysis of higher quality studies (7 studies) found a statistically significant moderate effect on pain improvement (ES 0.49, 95% CI: 0.21, 0.77). There was no evidence of statistically significant heterogeneity (Q=3.2, d.f.=6). A subgroup analysis found a moderate effect associated with relaxation plus guided imagery (ES=0.49), relaxation plus guided imagery plus hypnosis (ES=0.46), and self-selected music (ES=0.39), and a large effect associated with relaxation alone (ES=0.91).

Educational interventions (6 studies): the pooled analysis showed that these interventions had a small- to moderate-sized significant effect on pain (ES=0.36). No statistically significant heterogeneity was detected. The ES was larger and statistically significant when only higher quality studies were analysed (3 RCTs; ES 0.40, 95% CI: 0.16, 0.64).

Relaxation plus other interventions (6 RCTs): the studies differed in the types of treatment and ES (range: 0.24 to 0.51). The pooled analysis showed no difference between the intervention and control (ES 0.07, P>0.05). Of the 5 studies showing no floor effect on pain, one showed a benefit for relaxation, guided imagery, distraction and positive affirmation (ES=0.38), 2 studies showed inconsistent effects for education about pain plus relaxation, distraction and cutaneous stimulation (ESs were 0.24 and 0.24) and 2 studies showed small to medium effects for relaxation, imagery, cognitive reappraisal and goal setting (ESs were 0.23 and 0.51).

Supportive counselling plus other interventions (5 studies): the pooled analysis showed that the interventions had a small- to moderate-sized significant effect on pain (ES=0.44). No statistically significant heterogeneity was detected. The one higher quality RCT showed a small- to moderate-sized significant effect on pain (ES 0.35, 95% CI: -0.09, 0.57). The pooled analysis of the 3 RCTs showed that the interventions had a small- to moderate-sized significant effect on pain (ES 0.33, 95% CI: 0.07, 0.59). No significant heterogeneity was detected (Q=0.14).

**Authors' conclusions**

Psychoeducational interventions may be helpful as an adjunctive treatment to analgesia, but they should not replace analgesia.

**CRD commentary**

The review question was clear in terms of the study design, intervention, participants and outcomes. Several relevant sources were searched, including potential sources of unpublished material, and the search terms were stated. It was not stated whether any language restrictions were applied, thus the potential for language bias could not be assessed. The methods used to select the studies and assess validity were not described; hence, any efforts made to reduce errors and bias cannot be judged. Validity was assessed using specified criteria and some relevant information on the included studies was tabulated. The characteristics of the included studies were summarised in the text. The methods used to combine the studies appear appropriate and statistical heterogeneity was assessed. Where studies were heterogeneous, this was highlighted and the results from these studies were discussed individually. The influence on the results of study validity and type of treatment were explored. The evidence presented appears to support the author's conclusions, but limitations in the review process mean that the results may not be reliable.

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

**Practice:** The author stated that psychoeducational interventions may be a useful adjunctive treatment for pain in adults with cancer. In addition, a comprehensive assessment of current pain management and the nature of the pain is required, and that the appropriate use of analgesia is of critical importance. The authors further stated that the interventions should not be too taxing for patients in pain to use.

**Research:** The author stated that high-quality research is required to compare different types of treatment, the duration of treatment effect, and the frequency of treatment administration for optimal benefit. In addition, future research should assess quality of life, and researchers must tackle the complex nature of pain and the use of cointerventions for pain and must describe these elements in their research reports.
Funding
National Institutes of Health, grant number #R15 NR04750.

Bibliographic details

PubMedID
12515986

DOI
10.1188/03.ONF.75-89

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Chronic Disease; Cognitive Therapy /methods; Counseling /methods; Female; Humans; Male; Neoplasms /complications; Pain /classification /etiology /prevention & control /psychology; Pain Measurement; Patient Education as Topic /methods; Quality of Life; Relaxation Therapy; Reproducibility of Results

AccessionNumber
12003003528

Date bibliographic record published
30/04/2005

Date abstract record published
30/04/2005

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.