How effective are patient-based educational interventions in the management of cancer pain: systematic review and meta-analysis

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CRD summary
The authors found that patient-based educational interventions significantly reduced cancer pain, although the effect was modest and did not appear to translate into reduced pain in daily activities or improved medication adherence. The review was well conducted, but due to methodological limitations of the primary studies and heterogeneity in the findings these conclusions may require a degree of caution.

Authors' objectives
To assess the effectiveness of patient-based educational interventions for management of cancer pain.

Searching
MEDLINE, CINAHL, EMBASE, PsycINFO, ASSIA and AMED were searched from inception to November 2007. The search strategy was available on request. The Cochrane Library, the website of the National Institute for Clinical Excellence and the journals Pain, Journal of Clinical Oncology and Journal of Patient Education and Counseling (1997 to 2007) were also searched. The reference lists of retrieved studies and previous reviews were checked.

Study selection
Randomised and non-randomised controlled trials (RCTs and non-RCTs) of patient-based educational interventions delivered on an individual basis to adults with pain from active cancer were eligible for inclusion, provided pain-related outcomes were reported. Controls were required to receive usual care or attention only. Educational interventions were defined as information, behavioural instruction and advice on pain management delivered by a health provider or peer (such as an expert patient) using any medium (for example, verbal, written, taped and computer-aided). Studies of pain related to cancer treatment were excluded, as were studies using behavioural methods (such as relaxation) either alone or combined with education.

Most of the participants in the included studies were female. Most participants were recently diagnosed and had a relatively good performance status. In most studies the intervention was a face-to-face coaching session of 15 to 60 minutes plus a written booklet. The intervention was usually delivered by a nurse (where reported), most commonly in a single session with or without phone follow up. Controls received a placebo/attention control such as a booklet on nutrition or a pain-management booklet alone (without coaching). The median duration of follow up was four weeks (range one to 26 weeks). The main review outcomes were knowledge or attitude about pain and analgesia, and pain intensity. Other outcomes included medication adherence, self-efficacy and interference with daily life. Outcomes data were collected by face-to-face interview, telephone or postal questionnaire (where stated). Various assessment scales were used (such as the Barriers Questionnaire). Studies were conducted in North America, Taiwan, Europe and Australia.

Two reviewers independently selected the studies. Disagreements were resolved by consensus or by consulting a third reviewer.

Assessment of study quality
The following aspects of validity were considered: randomisation and allocation concealment (randomised studies only); adjustment for confounders (non-randomised studies only); and baseline similarity of groups; equivalent treatment of groups; blinded assessment; outcomes reporting; and use of intention to treat analysis (all studies). The assessment was conducted by one reviewer and checked by a second.

Data extraction
Relative risks (RRs) were calculated for dichotomous data and weighted or standardised mean differences (WMD or SMD) calculated for continuous data. Corresponding 95% confidence intervals (CIs) were calculated. Data were
extracted by one reviewer and checked by a second. Reviewers contacted study authors for additional information as required.

**Methods of synthesis**
Where studies had reasonably similar clinical and methodological characteristics, data were combined using a random-effects model. Statistical heterogeneity was assessed using the Χ² test and the I² statistic; p more than 0.1 and I² less than 50% indicated relative homogeneity. Subgroup analyses were conducted for the main outcomes, based on intervention exposure (single, single with phone follow up and multiple) and type of comparator (usual care and placebo/attention). Sensitivity analyses were conducted to examine the effect of study design (RCT and non-RCT).

**Results of the review**
Twenty-one studies were eligible for inclusion (n=3,501, range 30 to 1,256): 19 RCTs (n=3,367) and two non-RCTs (n=134). Most studies failed to report their methods in adequate detail. Only eight described their randomisation method (considered adequate), only three reported blinded assessment and most failed to describe dropouts or report analysis by intention to treat. In nine studies, groups differed at baseline.

**Patient education versus usual care or placebo/attention control:** The intervention significantly improved knowledge and attitudes towards cancer pain and analgesia, the difference being half a point on a 0 to 5 scale (WMD 0.52, 95% CI 0.04 to 1.00, p=0.03; six RCTs). There was significant heterogeneity (I²=91%). Pooling of all nine studies with data suitable for meta-analysis also showed a significant improvement for this outcome (SMD 0.54, 95% CI 0.22 to 0.87). Three studies that reported dichotomous outcomes all reported a statistically significant benefit from the intervention.

**Sixteen studies reported pain intensity using a 1 to 10 scale:** The intervention significantly reduced pain intensity (WMD -1.10, 95% CI -1.80 to -0.41, p=0.002; eight RCTs). There was significant heterogeneity (I²=88%). The intervention also significantly reduced maximum pain intensity (WMD -0.78, 95% CI -1.21 to -0.35, p=0.0004; eight studies, I²=38%), least pain (WMD -0.98, 95% CI -1.68 to -0.28, p=0.006; two RCTs, I²=34%) and current pain (WMD -0.65, 95% CI -1.21 to -0.09, p=0.02; four RCTs, I²=13%).

Findings for self-efficacy (six studies) were inconsistent. No statistically significant benefit for the intervention was found in two out of three studies that reported medication adherence. No statistically significant benefit for the intervention was found in seven out of eight studies that reported interference by pain with daily activities.

Both single and multiple exposure interventions were beneficial. Effects were more marked when compared with usual care than when compared with a placebo or attention control. Results did not vary substantially by study design.

**Authors’ conclusions**
Patient-based educational interventions significantly reduced cancer pain, although the effect was modest and did not appear to translate into reduced pain in daily activities or improved medication adherence.

**CRD commentary**
The objectives and inclusion criteria of the review were clear and relevant sources were searched for studies. Steps were taken to minimise the risk of reviewer bias and error by having more than one reviewer select studies, assess validity and extract data. Relevant criteria were used for the validity assessment. Statistical techniques used to pool the data and assess for heterogeneity appeared appropriate. The authors explored possible reasons for the strong heterogeneity in the results (such as the wide variety of outcomes measures and methods of data collection in the primary studies). They acknowledged that unexplained heterogeneity weakened the strength of their findings. The review was well-conducted, but due to the methodological limitations of and heterogeneity between the primary studies, the authors’ conclusions may require a degree of caution.

**Implications of the review for practice and research**
**Practice:** The authors stated that services for patients with cancer pain should routinely provide patient-based education to improve knowledge of pain management and analgesia (for example, consistent screening to identify and address misunderstandings about pain and analgesia provided by specialist nurses and pharmacists). For patients who already received opioids, an educational session may be more effective than addition of co-analgesics.
Research: The authors stated that further qualitative and quantitative research should explore the relationship between education and improved pain, and aim to identify which patients benefited most. Pragmatic trials could investigate the use of brief low-cost audio-visual interventions (especially for those with advanced disease), as well as optimum timing for the intervention.

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