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A systematic review of the effectiveness of patient-based educational interventions to improve cancer-related pain

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ABSTRACT

Background: Despite existing guidelines to assess and manage pain, the management of cancer-related pain is often suboptimal with patients often being undertreated. Inadequate pain management may be due to patient-related barriers. Educating patients may decrease these barriers. However, the effect of pain education on patient-related outcomes is still unclear. This review aimed to study the effect of educational interventions on cancer-related pain.

Design: We performed a systematic review of randomized controlled trials (RCTs) identified from Medline and Cinahl, from 1995 to May 2017. Two reviewers independently selected trials comparing educational intervention to usual care or an active control intervention. The methodological quality was assessed and data extraction was done independently. Primary outcome measures were pain intensity and interference. Secondary outcome measures were knowledge/barriers, medication adherence and self-efficacy.

Results: Twenty-six RCTs totaling 4735 patients met our inclusion criteria. Compared to the control group, 31% of the studies (including 19% of all patients) reported a significant difference in pain intensity in favor of the intervention group. Twelve studies measured pain interference and four (30%) found a significant improvement. With regard to secondary endpoints, significant differences in favor of the experimental arms were found for pain knowledge or barriers (15/22 studies; 68%), medication adherence (3/6 studies; 50%) and self-efficacy (1/2 studies).

Conclusions: Patient-based pain educational programs may result in improvements of relevant patient-reported outcomes. However, the interventions are heterogeneous and improvement of pain was only seen in less than one third of the studies and in less than 20% of all included patients.

Introduction

Pain continues to be a frequently occurring symptom in patients with cancer, with a prevalence of 66% in patients with advanced, metastatic or terminal disease. In addition, 38% of all patients with cancer-related pain report moderate or severe pain (≥5 on a 0–10 numeric rating scale) [1]. Pain is associated with interference with daily activities, sleep, mood and social interactions [2–4]. Despite existing guidelines to assess and manage pain [5–7], the management of cancer-related pain is often suboptimal [8] and patients are regularly undertreated [9]. Inadequate pain management seems to be related to professional as well as patient-related barriers. The most commonly reported professional-related barriers include inadequate assessment and inadequate knowledge of pain management. The three most frequently described patient-related barriers are: poor knowledge and misconceptions about pain medication and their side-effects, non-adherence to treatment regimens and a deficit in communication about pain with health care providers [2,10]. Different

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educational interventions to reduce patient-related barriers and to improve their knowledge and communication with healthcare professionals have been developed and studied. Because these interventions vary greatly in type, content and duration the effects are still uncertain [3,10–12]. Moreover, it remains unclear which intervention components are most effective to improve cancer pain management [3,10–14].

In the Netherlands we recently updated our national evidence-based guideline "Diagnostics and treatment of pain in patients with cancer" [7]. As part of this guideline update, the literature on the effectiveness of educational interventions was systematically reviewed, since various new randomized controlled trials (RCTs) were published in the last 7 years and the existing reviews did not report all possible relevant outcomes. It was hypothesized that educating patients about pain improves their knowledge, reduces pain-related barriers and improves medication adherence and self-efficacy, which will all lead to better pain control and less interference with daily life [15]. The aim of this systematic review is to investigate the effectiveness of educational interventions in patients with cancer-related pain on all these relevant outcomes.

Materials and methods

Search methods

A systematic search of the literature published between January 1st 1995 and May 8th 2017 was performed using the following databases: Medline (OVID) and Cinahl. Together with a literature search specialist (IM), we developed a comprehensive search strategy combining key terms using a series of free text terms and MESH terms for: profession and/role (e.g. nurse; nurse practitioner; cancer nurse; oncology nurse) and Cancer (e.g. neoplasm; tumor, etc.). Boolean operators were used in order to maximize the penetration of terms searched, and appropriate "wild cards" were used to account for plurals, variations in databases and spelling. Previous reviews included randomized controlled trials, as well as studies with nonrandomized designs. Because there are many studies investigating the effect of educational interventions, in this review only randomized controlled trials were included. An example search strategy is provided in Supplementary file 1.

Only articles published in English, Dutch or German were considered. Bibliographies of selected studies and relevant Cochrane reviews were also hand-searched in order to identify any further relevant studies not detected by the electronic search.

Criteria for considering studies for this review

Studies were selected if the patient population consisted of adult patients with cancer-related pain. Nociceptive, neuropathic as well as mixed nociceptive and neuropathic pain were included. Only studies regarding patients with solid malignancies were included. All studies describing interventions in which patients received education about the management of their cancer-related pain were eligible. We defined educational interventions as information, behavioral instructions and advice given for the management of cancer-related pain (by verbal, written, audio- or videotaped or computer-aided modalities), which are given by a healthcare professional. Interventions aimed only at family caregivers and studies in which patients' pain intensity was not self-reported were excluded. For inclusion of studies, no restraints regarding the duration of follow-up were made.

The intervention could be compared to no intervention (care as usual) or an active control intervention (e.g. attention visits or education about nutrition).

Primary outcome measurements considered in this review were pain intensity and pain interference, measured before and after intervention. Secondary outcome measures were: knowledge about cancer-related pain, pain barriers, medication adherence and self-efficacy.

Study selection

One reviewer conducted the searching and initial screening. A second reviewer (JG, WO, or IM) independently assessed all titles with or without abstracts identified by the search. In case of potentially relevant articles, the full text was obtained to judge if they fulfilled the inclusion criteria. For the articles that met our inclusion criteria, data were extracted independently by two authors (WO, IM and/or JG), after which extracted data were compared. All studies were assessed in a standard manner. For each trial included, information was extracted on study design, number of patients, length of follow-up, kind of intervention, pain intensity, knowledge about pain, pain barriers, pain interference with daily life, medication adherence and self-efficacy.

Assessment of risk of bias in included studies

The quality of each RCT was assessed by two authors (WO, IM) by examining the risk of bias of each paper based on the adequacy of randomization, blinding, presence of selective outcome reporting, information provided on withdrawals and dropouts and potential violation of intention-to-treat analysis [16]. Disagreement on methodological quality was resolved, when necessary, by discussion between these two authors.

Results

Characteristics of included studies.

The literature search identified 680 titles. Fig. 1 shows the selection process. A total of 53 papers was selected for full text assessment. A high level of concordance was achieved as there was disagreement in only 4 out of 53 papers. These 4 papers were discussed with two additional authors until consensus was achieved. Twenty-nine articles fulfilled our inclusion criteria, describing 26 different studies as three studies [17–22] were described in several articles.

A total of 4735 patients were included. The study population varied from 30 to 1256 patients at baseline. Twelve studies were conducted in the USA [18,23–33], eight in Europe [20,21,34–39], three in Asia [40–42], two in Australia [43,44] and one in Canada [45].

Most studies (20) included outpatients [18,20,21,23–29,31–33, 35–37,41,43–45], five studies included inpatients [34,38–40,42] and one study included both inpatients and outpatients [30]. Three studies included both patients and family caregivers [29,30,41].

In 13 studies, the control group received care as usual [21,24, 27–29,34,36–39,41,43,45], in the other studies an active control intervention was given (Supplementary Table 1).

Although the interventions varied widely in content and intensity, 22 out of the 26 (85%) studies provided face-to-face sessions with the patients; 19 of these studies provided repeated contacts: four studies several face-to-face sessions and additional phone calls, five studies only repeated face-to-face sessions, and ten studies one face-to-face contact and additional phone calls. Seventeen studies combined these sessions with a booklet or video. The three studies without face-to-face contacts provided a booklet and/ or educational video supplemented with phone calls in two of them. Follow-up varied from 5 days to 6 months (median 8 weeks) (Supplementary Table 1).