Evaluation of “The Many Faces of Pain”: A chronic cancer pain management education program

By Judith Wells, Barbara Turner and Eileen Coombs

Abstract

A descriptive, correlational design was used to evaluate the effectiveness of a chronic cancer pain management education program. The Nurses' Knowledge and Attitude Survey Regarding Pain (NKAS) was used to evaluate the program. A convenience sample of 27 registered nurses was recruited to participate in the study. Analysis of the data revealed a significant difference between pre-test and post-test scores on the NKAS. There were no significant correlations observed between any study variables. The small convenience sample prevents the ability to generalize the findings. It is concluded that the education program was effective in improving knowledge and attitudes related to chronic cancer pain management. Implications for nursing practice, research, education, and administration are suggested.

Despite the advances made in the treatment of cancer pain, many patients continue to report pain that interferes with various life domains (Allard, Maunsell, Labbe, & Dorval, 2001; Coluzzi, 1998; Ferrell, 1995; Yates, Edwards, Nash, Walsh, Fentiman, Skerman, et al., 2002). A systematic review of the literature by Allard et al. (2001) revealed that 20% to 50% of patients diagnosed with cancer and/or undergoing active cancer treatment and 55% to 95% of patients in advanced stages of the disease experienced pain. While the evidence suggests the use of clinical practice guidelines can result in adequate pain management in 70% to 90% of patients with advanced cancer, it is reported that almost 50% still have inadequate pain control (Allard et al., 2001).

Efforts aimed at improving nurses' knowledge and attitudes related to pain management have been found to be beneficial (Francke, Garssen, et Abu-Saad, 1996; McCaffery & Ferrell, 1997). While there have been short in-services aimed at specific areas of pain management (i.e., pharmacological pain management), registered nurses within a regional health authority in Newfoundland and Labrador have continued to identify pain management as a priority educational need. In addition, there has been no evaluation of the benefit of these in-services. The purpose of the current pilot study was to determine how effective a chronic cancer pain management education program (hereafter referred to as the program) was in improving nurses' knowledge and attitudes related to cancer pain. The

researchers also examined relationships among the study variables, and whether changes in knowledge and attitudes subsequently led to changes in nursing practice.

Literature review

Many barriers have impeded effective pain management, with the most frequently cited barrier being inadequate knowledge and negative attitudes. One explanation for this barrier has been lack of ongoing continuing education for nurses in the area of pain management. The focus of this literature review will be confined to studies assessing nurses' knowledge and attitudes, studies investigating the impact of cancer pain education programs on nurses' knowledge and attitudes, and those examining change in clinical practice following the implementation of educational strategies.

Nurses' knowledge and attitudes related to cancer pain management

The empirical data related to nurses' knowledge deficits and negative attitudes toward various aspects of cancer pain management is well-documented (Barnason, Merboth, Pozehl, & Tietjen, 1998; Brown, Bowman, & Eason, 1999; Cason, Jones, Brock, Maese, & Milligan, 1999; Clarke, French, Bilodeau, Capasso, Edwards, & Empoliti, 1996; Dalton, Carlson, Mann, Blau, Bernard, & Youngblood, 1998; Ferrell, Grant, Ritchey, Ropchan, & Rivera, 1993; Heath, 1998; Howell, Butler, Vincent, Watt-Watson, & Stearns, 2000; Kubecka, Simon, & Boettcher, 1996; Lebovits, Florence, Bathina, Hunko, Fox, & Bramble, 1997; McMillan, Tittle, Hagan, Laughlin, & Tabler, 2000; O'Brien, Dalton, Konsler, & Carlson, 1996; Pargeon & Hailey, 1999; Rushton, Eggett, & Sutherland, 2003; Vallerand, Riley-Doucet, Hasenau, & Templin, 2004; Wells, Dryden, Guild, Levack, Farrer, & Mowat, 2001). Specifically, it has been suggested that inadequate pain assessment (Coluzzi, 1998; Dalton, et al., 1996; Howell, Butler, Vincent, Watt-Watson, & Stearns, 2000) and inadequate knowledge about pharmacological aspects of cancer pain management (Dalton, et al., 1996; McCaffery, & Ferrell, 1997; O'Brien, Dalton, Konsler, & Carlson, 1996) may contribute to the widespread under-treatment of cancer pain. While most studies have focused on nurses in acute care practice in urban areas, knowledge deficits have been identified amongst nurses internationally (McCaffery & Ferrell, 1995) as well as extending across the health continuum to include nurses in community (de Wit & van Dam, 2001) and rural (Kubecka, Simon, & Boettcher, 1996) practice settings. In addition, recent evidence suggests that nurses are oblivious of their personal knowledge gaps and poor attitudes (Howell, et al., 2000), and are unaware of the magnitude of the problem of cancer pain management (Fife, Irick, & Painter, 1993).

Effectiveness of cancer pain management education programs

Lack of education related to cancer pain management has been identified as another factor contributing to inadequate treatment of cancer pain (Ad Hoc Committee on Cancer Pain of the American Society of Clinical Oncology, 1992; Gibbs, 1995). A review of 12 studies examining the effects of pain management programs found

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that a positive outcome was noted on nurses' knowledge and attitudes scores (Francke, Garssen, & Abu-Saad, 1996). Researchers using a pre- and post-survey design to determine the effectiveness of education programs reported a significant improvement in knowledge and attitude scores following the implementation of the programs (Barnason, et al., 1998; Bookbinder, Coyle, Kiss, Goldstein, Holritz, Thaler, et al., 1996; Ferrell et al., 1993; Howell et al., 2000; Janjan, Martin, Payne, Dahl, Weissman, & Hill, 1996; Vallerand, Riley-Doucet, Hasenau, & Templin, 2004; Weissman, Griffie, Gordon, & Dahl, 1997). In contrast, others have reported that while there was a slight improvement in knowledge and attitudes, the difference failed to reach statistical significance (Dalton et al., 1996; Elliott, Murray, Oken, Johnson, Braun, Elliott, et al., 1997). Overall, it has been suggested that educational programs may have some beneficial effect and should be continued (Allard, et al., 2001; McCaffery, & Ferrell, 1997). Evaluation of program content and/or facilitators has been highly rated by participants (Dalton, et al., 1996; de Wit, & van Dam, 2001; Ferrell, et al., 1993; Weissman, et al., 1997).

Change in nursing practice

Research investigating the impact of cancer pain education programs on nursing practice has been limited and the studies have consisted mostly of self-report by nurses and retrospective chart audits. Several researchers have reported positive changes in clinical pain management practices such as assessment (Barnason, et al., 1998; Dalton, et al., 1996; Dalton, et al., 1998; Ferrell, et al., 1993; Serman, Gauker, & Krieger, 2003), documentation (Dufault, Bielecki, Collins, & Willy, 1995; Howell, et al., 2000), and implementation of clinical pain standards (Howell, et al., 2000; Weissman, et al., 1997). Despite this, adequate documentation, for the most part, has been reported to be lacking and had not improved much after nurses' education (Dalton, et al., 1996), or was not maintained over time (Howell, et al., 2000).

Methodology

The educational program

The program called, "The Many Faces of Pain", comprised a two-day workshop facilitated by the investigators of the study. The content reflected the educational needs of the registered nurses, and was based on clinical practice guidelines for the management of chronic cancer pain (Agency for Health Care Policy and Research, 1994). It was also consistent with similar pain education programs identified in the literature (City of Hope National Medical Centre, 1994; Ferrell, et al., 1993; Ferrell, Rhiner, Grant, & Supportive Care Services, 1992; Francke, et al., 1996). The program consisted of eight education modules related to pain management (see Table One). Adult learning theory guided the instructional methodologies, which included lectures, and group work involving case studies for discussion and problem solving.

Design, sample, and ethical considerations

A descriptive, correlational design was used to evaluate a pilot of a chronic cancer pain management education program. After receiving approval from the organization's ethical review board, a convenience sample of 27 registered nurses was recruited from acute care, long-term care, and community health practice settings. Twenty of the participants were recruited through educational services. Advertisements outlining the purpose of the study and requesting volunteers for the study were distributed to all facilities within the regional health authority. The remaining seven were recruited from a group of registered nurses who were completing orientation to a new specialty area. A detailed explanation of the study was provided to the participants and informed consent was obtained. Participants were told they could withdraw at any time.

Instruments and data analysis

A demographic data form collected information related to age, years in nursing, previous pain education, educational preparation and practice area (i.e., acute, long-term care or community). The Nurses Knowledge and Attitude Survey Regarding Pain (NKAS) by Ferrell and McCaffery (1997) was used to determine participants' knowledge and attitudes about pain management. The instrument was administered immediately prior to and after the delivery of the program. The NKAS comprises 39 items with each item awarded the same weight for scoring purposes. Content and construct validity as well as test-retest reliability ($> .80$) and internal consistency reliability ($> .70$) had previously been established. Items reflect both knowledge and attitude domains, and have been found to discriminate between levels of expertise (Ferrell & McCaffery, 1997). Permission to use the NKAS was obtained. Internal consistency for the NKAS in the current study was a Cronbach alpha of 0.70.

A formative evaluation tool developed by the investigators was used to evaluate the education program content and the facilitators, and was completed at the end of each module. The indicators used a Likert scale ranging from one (strongly disagree) to five (strongly agree). There was also a space for other suggestions or comments. Finally, change in nursing practice was evaluated using a three-month follow-up survey that was mailed to all participants. This instrument was adapted from one identified in the literature (Ferrell et al., 1993). The instrument comprised three parts. Part one was a Likert-type scale of one (not applicable) to four (extent to which there was a change observed in practice) and asked questions related to changes in number of patients cared for, attitudes, and teaching. Part two asked questions related to specific areas of practice (i.e., care of patients, communication with physicians, psychosocial aspects, ability to act as a resource, and the desire to read about pain management) and used a Likert scale of one (not at all) to five (very much). Part three asked their satisfaction, on a scale of one (not satisfied) to five (very satisfied), with the program content. Participants were asked to indicate whether they utilized other disciplines to assist with cancer pain management and, finally, to provide an overall rating of the program using a scale of one (poor) to five (excellent). Basic descriptive and inferential statistical procedures (i.e., mean, percentages, correlations and paired t-tests) were used to analyze the data. An alpha of < 0.05 was chosen as the level of significance.

Results

The majority of the participants were female ($n = 26$), and employed in acute care practice areas ($n = 16$). The remaining participants were employed in long-term care ($n = 6$), cancer care

Table One. Cancer pain management education program

Content	
Module I	Theories of pain
Module II	Barriers to pain management
Module III	Pain assessment
Module IV	Pain assessment in the older and cognitively impaired adult
Module V	Pharmacological management of pain
Module VI	Equianalgesic dosing
Module VII	Non-pharmacological management of pain
Module VIII	Nurse's role in pain management

(n = 1) and community health centres (n = 4). The mean age was 40.80 (SD = 6.96) and the mean years working in nursing were 18.25 (SD = 7.83). The majority (n = 26) was diploma prepared and had received no previous pain education (n = 21).

The NKAS post-test score (M = 90%, SD = 5.60) was significantly higher, $t(26) = -12.08$, $p = .000$, than the pre-test score (M = 67.4%, SD = 10.90). Analysis of individual items revealed that all participants at both pre- and post-test responded correctly to the statements related to individualization of pain control, use of placebos, and concurrent use of non-pharmacological measures (see Table Two). Twelve items were answered incorrectly on the pre-test by greater than 50% of the participants (see Table Three), with the most problematic areas being related to the pharmacological management of pain. For example, only 7.4% on the pre-test, compared with 67% on the post-test, were aware that Aspirin 650 mg orally was equivalent to Demerol 50 mg orally.

As well, only 29.6% on the pre-test, compared with 74% on the post-test, could identify the recommended route for opioid administration for the treatment of chronic cancer pain. Thirty-three per cent on the pre-test, compared to 88.9% on the post-test, could correctly convert Morphine 30 mg orally to an equivalent intravenous dosage. Participants also demonstrated some myths about respiratory depression, addiction, and the over-reporting of pain by patients. Overall, there was a significant difference in participants' responses to 21 of the items ($p < .05$) with the greatest improvement noted in the pharmacological aspects of cancer pain management.

Participants' evaluation of the content of each module, as well as the knowledge and presentation of the facilitators was quite favourable. The mean score for content of all eight modules ranged from 4.27 to 4.60 indicating participants agreed that the content was relevant, instructional strategies were appropriate, objectives were met, and the participant workbook contributed to learning. Evaluation of the facilitators was similar with mean scores ranging from 4.29 to 4.67 indicating participants felt the facilitators were knowledgeable, presentation style was appropriate, the environment conducive to learning, and there was adequate time for discussion and problem-solving. Written comments included: "I realize how little I understood on the topic", "facilitators well-prepared", and "very informative". Suggestions for improvement included more time for problem-solving and discussion, especially with equianalgesic dosing, more time for assessment of the older and cognitively impaired adult, and several suggested more information be in written format in the workbook (i.e., definitions, pain theories).

Table Two. Questions answered correctly by 100% of participants

Number	
13	The patient with pain should be encouraged to endure as much pain as possible before resorting to pain relief measures.
16	After the initial dose of opioid analgesic, subsequent doses are adjusted in accordance with the individual patient's response.
20	The patient should be advised to use non-drug techniques alone rather than concurrently with pain medications.
21	Giving patients sterile water by injection (placebo) is often a useful test to determine if the pain is real.
32	The most accurate judge of the intensity of the patient's pain is who?

Data from the three-month survey (n = 22) suggest that nurses perceived positive changes had occurred in clinical practice. Approximately one-third of the participants (34.8%) indicated there had been an increase in the number of patients with cancer under their care. A majority of nurses indicated they had more positive attitudes (60.9%), had done more teaching with patients related to pain management (60.9%) and non-pharmacological pain measures (43.5%), and had done more teaching with colleagues related to pain assessment (73.9%) and pain medication (63.6%). The majority of respondents indicated the program had improved: the care they provided to patients with cancer (82.6%); communication with physicians (68.1%); care with regard to psychosocial issues (68.2%); their ability to act as a resource for nurses (82.6%); their desire to read about pain management (69.5%); and their understanding of how other disciplines could assist with pain management (82.6%). The mean overall rating of the program was 4.65 suggesting they still felt it was an excellent program with 30% recommending that all registered nurses within the regional health authority have access to the program. None of the study variables demonstrated any significant relationships with the NKAS. However, there was a trend that suggested younger and less-experienced registered nurses had higher post-test scores ($p = .05$).

Table Three. Questions answered incorrectly on the pre-test by greater than 50% of participants

Number	
6	Aspirin (ASA) and other non-steroidal anti-inflammatory agents are not effective analgesics for bone pain caused by metastasis.
7	Non-drug interventions are very effective for mild to moderate pain control, but are rarely helpful for more severe pain.
9	ASA 650 mg PO is approximately equal to meperidine 50 mg PO.
11	The usual duration of action of meperidine is four to five hours.
12	Research shows that promethazine is a reliable potentiator of opioid analgesics.
23	What is the recommended route of administration of opioid analgesics to patients with prolonged cancer-related pain?
24	What is the recommended route of administration of opioid analgesics to patients with brief, severe pain of sudden onset?
26	Which of the following IV doses of morphine administered over a four-hour period would be equivalent to 30 mg of oral morphine given q4h?
28	What is the likelihood of the patient developing clinically significant respiratory depression?*
35	How likely is it that opioid addiction will occur if treating pain with opioid analgesic.*
37	Check action you will take *
39	Check action you will take *
*Participants were given a scenario to respond to.	

Discussion

Evaluation of the education program demonstrated that it was an effective strategy in improving nurses' knowledge and attitudes toward pain. These findings are supported by other researchers (Barnason, et al., 1998; Bookbinder, et al., 1996; Ferrell, et al., 1993; Howell, et al., 2000; Janjan, et al., 1996; Weissman, et al., 1997; Wells, et al., 2001). While these results may not be generalizable due to the small sample, they are similar to findings from other studies using larger samples (Bookbinder, et al., 1996; Howell, et al., 2000; Janjan, et al., 1996; Weissman, et al., 1997). Based on the item analysis, it can be concluded that participants gained knowledge, as well as improvements in attitudes and clarification of myths related to the management of chronic cancer pain.

The program content and facilitators were evaluated quite positively. In view of the fact the majority of participants had received no previous pain education, it is concluded that the program is a good starting point for continuing cancer pain education for registered nurses. Other researchers evaluating similar programs have reported excellent feedback from participants on program content (Dalton, et al., 1996; de Wit & van Dam, 2001; Ferrell, et al., 1993). Similar to the findings from the current study, participants in a study by Ferrell et al. (1993) also evaluated facilitators very well, suggested more time for discussion and problem-solving, and recommended the program be available to all registered nurses. While a few participants in the current study suggested more written information in the workbook, the facilitators feel this would be in contradiction of the learning theories used to guide the instructional methodologies. While participants indicated a better understanding of the role of other disciplines, it was interesting to note that pharmacists were consulted more frequently than other disciplines. This may be due to the emphasis on pharmacological interventions in clinical practice.

Nurses' knowledge and attitudes appear to influence clinical practice. The three-month subjective questionnaire indicated that nurses perceived positive changes had occurred within all aspects of their clinical practice. Improvements in various aspects of practice following implementation of pain education programs have also been reported in other studies (Barnason, et al., 1998; Dalton, et al., 1996; Dufault, et al., 1995; Elliott, et al., 1997; Ferrell, et al., 1993; Howell, et al., 2000; Weissman, et al., 1997). In contrast, other researchers suggest that a change in knowledge may not necessarily lead to a change in nursing practice behaviours (de Wit & van Dam, 2001) or any improvement in patient pain levels (Allard, et al., 2001).

The current study failed to find any significant correlations between pre- and post-scores of the NKAS and the demographic variables. Similarly, other researchers have failed to document any relationship between knowledge and attitude scores and experience and facilities (Kubecka, et al., 1996), education level (Brown, et al., 1999; Kubecka, et al., 1996), age (Bookbinder, et al., 1996), or practice setting/clinical specialty (Brown, et al., 1999). However, there is some evidence to suggest that nurses working with oncology patients (Cason, et al., 1999; Clarke, et al., 1996; Rushton, et al., 2003; O'Brien, et al., 1996), on medical units (Lebovits, et al., 1997), and nurses with higher education levels (Cason, et al., 1999; Clarke,

et al., 1996; Dalton, et al., 1998; Lebovits, et al., 1997) tend to have fewer knowledge deficits and more positive attitudes toward cancer pain management. While some evidence exists to support a relationship between previous pain education and higher knowledge and attitude scores (Dalton, et al., 1998), other researchers (Cason, et al., 1999; Wells, et al., 2001) have failed to find any correlation. Lack of conclusive evidence may be related to the small samples used in many of the studies, the use of mostly descriptive designs, and the limited number of studies using randomized control groups.

Limitations

The small convenience sample may prevent the ability to generalize the findings. However, the results are similar to those reported elsewhere in the literature. The subjectivity of the three-month self-report evaluation without more objective, corroborating data from other sources is a limitation. Participants may have responded on the basis of what they perceived should have occurred as a result of what they had learned.

Implications

Data from this study will be used to guide revisions to the program, which will then be made available to all registered nurses within the regional health authority. If it can be assumed that the knowledge and attitudes of most nurses is similar to the findings from this study, it is essential that basic continuing education related to chronic cancer pain management be made available to all nurses across the continuum of health services. It has been reported that continuity of care was poor in relation to cancer pain management when patients went from hospital to home (de Wit & van Dam, 2001). Finally, because patients with cancer are often admitted to any nursing unit, the implementation of educational strategies should be across all practice settings.

Anecdotal comments from participants suggest that the lack of a systematic approach to pain assessment and management may be a barrier to effective cancer pain management. Therefore, there is a need for the regional health authority to integrate quality improvement programs related to cancer pain management. This would provide an opportunity for research to be carried out with a focus on assessing more objective patient outcomes and changes in clinical nursing practice. The implementation of pain education programs and clinical practice guidelines for cancer pain management will require a commitment from the regional health authority to ensure both human and financial resources are made available.

Summary

The current pilot study has demonstrated that nurses within this particular regional health authority have knowledge deficits and negative attitudes toward the management of cancer pain that are very similar to counterparts nationally and internationally. It has also demonstrated that the implementation of a cancer pain education program was effective in improving knowledge and attitudes. Based on these findings, the Regional Nursing Advisory Council has supported the implementation of the program to registered nurses employed within the region. The program is currently under revision. ♣

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