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Interventions to nurse-related barriers in cancer pain management

Dorota A. Bartoszczyk, RN BSN OCN and

Doctoral Student, The University of Iowa College of Nursing 101 College of Nursing Building, 50 Newton Road Iowa City, Iowa 52242, 319-335-7018

Stephanie Gilbertson-White, RN PhD

Assistant Professor, The University of Iowa College of Nursing, 444 College of Nursing Building, 50 Newton Road, Iowa City, Iowa 52242, 319-335-7023

Dorota A. Bartoszczyk: dorota-bartoszczyk@uiowa.edu; Stephanie Gilbertson-White: stephanie-gilbertson-white@uiowa.edu

Abstract

Purpose/Objectives—This critical literature review describes the findings and critiques the studies that have implemented interventions in nursing staff to improve pain management in adult cancer patients.

Data Sources—Publications were identified from following databases: PubMed, CINALH, PsychInfo and Scopus. Studies that describe interventions to overcome nurse-related barriers in cancer pain management practices were included in this review.

Data Synthesis—Nine studies were found that met the inclusion criteria. All studies were experimental and conducted between 1993 and 2013.

Conclusions—Increase in knowledge, change of attitudes and behaviors, and good relationships with specialists were found to be influential in overcoming existing nursing barriers to pain management in cancer patients. Studies concluded that educational interventions are more effective in increasing knowledge than in improving attitudes. Specialists were acknowledged as important resources and role models for nurses, especially if trust was established between both parties.

Implications for nursing—A number of interventions have been developed to address healthcare provider barriers. However, there is limited literature thus far on whether interventions that aim to overcome nurse-rated barriers have worked. This literature review provides critical insights on the effectiveness of interventions aimed to overcome barriers in nurses to effective pain management for adult patients with cancer.

Knowledge Translation—The knowledge of interventions that work in overcoming barriers to effective pain management can provide useful information for nursing educators, administrators and policyholders when implementing educational programs for nurses.

- Knowledge about pain management in nurses may be improved be educational interventions

- Attitudes nurses have about pain managements are hard to change and influence by educational interventions alone
- Role models, or specialist in pain management are helpful to nurses when trust is present

Keywords

cancer; pain; nurses; interventions; literature review

Purpose/Objectives

American Cancer Society predicts that in 2015 there will be 1,658,370 people diagnosed with cancer and 589,430 people will day because of it (2015). Pain often accompanies cancer and it is reported that 60% to 85% of patients with advanced cancer will experience pain during the disease process (All & Huycke, 1999; Kwon, 2014). According to the Institute of Medicine (IoM), pain impacts function and quality of life as well as use of health care resources and loss of productivity (2011). Therefore, effective pain management is critically important.

Barriers to effective pain control are related to the healthcare system, healthcare providers, caregivers and patients. Nurses are in the frontline dealing with cancer pain. The barriers that impact nurses in effective cancer pain management, such as inadequate education about pain mechanisms, types of pain medications, the importance of a proper pain assessment, documentation, persisting negative attitudes about drug seeking behaviors among opioids users and/or risk for over sedation, and lack of specialist have been well documented and researched for close to 30 years (Kwon, 2014). Thus, overcoming barriers to effective cancer pain management in older adults calls for increased attention and strong efforts.

In an excellent review of barriers to pain management, Fishman et al. (2013) note, “inadequate education of health care professional is a major and persistent barrier to safe and effective pain management” (p.973). Health professionals have inadequate education about for example how to manage different kinds of pain, how to combine various pain medications and manage side effects such as constipation or nausea. Inadequate knowledge, negative attitudes, lack of specialists and poor behavior performance are recognized as significant barriers in healthcare providers when dealing with cancer pain (Kwon, 2014). Notable, healthcare providers are knowledgeable on pain assessment but the knowledge is not reflected in their behaviors and actions (Kwon, 2014). For instance, nurses are not using appropriate pain assessment scales in practice and do not perform diligent and complete pain assessment documentation even though they know they should.

Several interventions have been attempted (All & Huycke, 1999; Fishman et al., 2013; Kwon, 2014) to address provider related barriers, in particular lack of knowledge, negative attitudes lack of specialist, to cancer pain management. The initial goal of this review was to describe studies of interventions to overcome nurse-related barriers to pain management for older adults with cancer. However, no studies were found that exclusively focused on nurses who cared for older adults with cancer. Therefore, the purpose of this literature review will

describe the effectiveness of interventions tested to overcome barriers in oncology nurses when providing pain management in adults as well as older adults with cancer.

Data Sources

Comprehensive literature searches were conducted, with the help of science librarian, using four databases: PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsychInfo and Scopus. The following key words were combined in PubMed: *aged OR older adults OR elderly AND attitude of health personnel OR barriers OR models OR perceptions AND nurses OR oncology nursing AND cancer AND pain*. The filter English language was applied to the search. Slightly different arrangements of the key words were used in other databases due to differences in engines' search preferences. PubMed revealed 180 articles, CINAHL 75 articles, PsychInfo 182 articles, and Scopus 14 articles. The abstracts were screened and final studies selected by utilizing the following inclusion and exclusion criteria. The inclusion criteria were: (1) the study sample included nurses working with adult oncology patient population that included older adults and (2) the study tested an intervention to overcome a nurse-related barrier in cancer pain management.

Data Synthesis

Study Designs

Following these screening criteria nine publications representing eight interventions studies were identified and systematically assessed by the authors to maintain rigor and quality. All studies were implementing an intervention(s) to address pain management barriers to nurses working with cancer patients (Table 1).

All the studies identified were experimental in nature. Four basic experimental designs were used (Bookbinder et al., 1996; Ferrell et al., 1993; McDonald et al., 2005, Wells et al., 2001), one was a longitudal, multilevel, randomized, controlled clinical train (Vallerand et al., 2004), and four were quasi-experimental studies (Gustafsson & Borglin, 2013; Idell et al., 2007, De Rond et el., 2000a; De Rond et al., 2000b). The nursing care provided in these studies ranged from various acute inpatients settings to outpatient agencies. Follow-up period post interventions varied from immediate to one year. The year range for the studies was 20 years; the oldest being designed in 1993 (Ferrell et al., 1993) and newest dated 2013 (Gustafsson & Borglin, 2013).

Sample and settings

All participants were nurses working with adult cancer patients. The sample sizes in studies ranged from 18 (McMillian et al., 2005) to 1210 (Bookbinder et al., 1996). Demographic characteristics of nurses participating in all nine studies varied. The mean age ranged from 32.8 to 50 years old. The majority of the nurses were females, ranging from 81.3% to 100%. Majority of the nurses were BSN prepared with the mean of 51.5%, and the average number of years in nursing ranged from 5 to 20 years. Five studies were done in the United States (Vallerand et al., 2004; Idell et al., 2007; McMillan et al., 2005; Bookbinder et al., 1996; Ferrell et al., 1993), others in Sweden (Gustafsson & Borglin, 2013), Netherlands (De Rond et al. 2000a, De Rond et al., 2000b) and United Kingdom (Wells et al., 2001).

Types of interventions

Two types of interventions were identified in the sample of studies. Two (Gustafsson & Borglin, 2013; Vallerand et al., 2004) out of the nine studies had control groups, and the remaining seven studies delivered their interventions to all participants. The first type of intervention was an educational program to improve pain management (Bookbinder et al., 1996; De Rond et al., 2000a; De Rond et al., 2000b; Gastafsson & Borglin, 2013; Ferrell et al., 1993; McMillian et al., 2005; Vallerand et al., 2004). The second type of intervention combined pain education with a change leader or a role model (Idell et al., 2005; Wells et al., 2001)

Educational Interventions

Seven studies tested five different models of pain education. Two studies employed an intervention that consisted of two approaches to a multi-day intense course to train pain resource nurses (PRNs) to lead and exemplify proper pain management (McMillian et al., 2005; Ferrell et al., 1993). The Power Over Pain (POP) model was employed to overcome barriers to pain management in homecare nurses (Vallerand et al., 2004). The Pain *Monitoring* Program was utilized to see the differences in nurses' communication, assessment, documentation, pain knowledge and attitude (De Rond et al., 2000a, De Rond et al., 2000b). The Pain *Management* Program aimed to shape structure, increase knowledge and help with problem solving (Bookbinder et al., 1996). Lastly, Ajzen's Theory of Planned behavior (TPB) provided the framework of an educational intervention that tested changes in knowledge and attitudes in nurses (Gustafsson & Borglin, 2013). The Pain *Monitoring* Program, the Pain *Management* Program, and TPB based educational intervention were similar in combining pain knowledge components and proper pain assessment practices. The POP enhanced education and nurses' assertiveness and improved skills as patient advocates when working in homecare settings.

Educational Intervention with a Role Model/Change Leader

Two studies in this review used an approach of implementing pain education and a change leader or role model simultaneously. One study used an application of research utilization model under the advance practice nurse leadership for nurses in acute settings (Idell et al., 2007) which is a framework conceived to change nurses' behavior in a systematic and organized way. The second intervention evaluated if teaching sessions with the presence and role modeling of palliative team specialists can improve nurses' knowledge and attitudes (Wells et al., 2001).

Outcomes measures

The nine studies measured one or more of four outcomes (See Table 2). The majority of studies used instruments with established validity and reliability. When researchers modified their instruments and/or used new tools, the validity and reliability was established (Gustafsson & Borglin, 2013; Idell et al., 2007; McMillan et al., 2005; Vallerand et al., 2004). Knowledge and attitudes were the most common outcome measures and four instruments or modified versions of them were utilized to measure these concepts. The Pain Competency Evaluation (Idell et al., 2007), The Pain Survey (McMillan et al, 2005), Pain

Attitude Inventory (De Rond, 2000b), and The Nurses Knowledge and Attitude Survey or its modified versions assessed knowledge and attitudes in all studies. All the studies used the same instruments or modified versions. Perception of Control Over Pain (Vallerand et al., 2004) measured sense of empowerment with regard to managing pain. Concordance on pain intensity between patient self-report and nurses' assessment was evaluated by questionnaires (De Rond et al., 2000b). Participants rated the helpfulness and value of role models, such as Palliative Care specialists' and pain specialists, for improved pain management (Wells et al., 2001; Vallerand et al., 2004). Pain documentation practices and behaviors were measures with The Pain Reassessment Data Tool (PRDT) (Idell et al., 2007), Quality of Nurses' Pain Assessment tool (De Rond et al. 2000a), and review of pain documentation (Bookbinder et al., 1996).

Impact of the interventions

Knowledge—Studies had increased knowledge of pain management scores from pre- to post- interventions, however only four studies reported their results in knowledge increase reaching statistically significant levels (Idell et al., 2007; McMillan et al., 2005; Gustafsson & Borglin, 2013; De Rond et el., 2000a; De Rond et al., 2000b). Most studies did look at certain subgroups of knowledge questions on the questionnaires to learn where the highest learning and increase in pain competency levels did take place and where it did not (Wells et al., 2001; McMillan, et al., 2005). The increase in knowledge about pain assessment was evident when the level of agreements about the pain scores between patients report of pain and nurses' perceptions were matching better after post-intervention (De Rond et al., 2000a). One study did report that many nurses had little to practically no formal pain education in their school curriculum and clinical practice (Wells et al., 2001).

Attitudes—Attitudes and knowledge were measured by one instrument and other times separate measures were used. Four studies reported attitude change reaching statistically significant levels (Idell et al., 2007; McMillan et al., 2005; Gustafsson & Borglin, 2013; De Rond et al., 2000b). Even though studies did find positive changes in attitudes, two studies reported that attitudes in health care professionals are harder to change than knowledge (Wells et al., 2001; McMillan, 2005). After the educational intervention, patient report of the quality of pain education provided by nurses improved, however this was not the case for older patients in this study who did not report improvement in the pain education provided by nurses ($P<0.001$)(De Rond et al., 2000a). Vallerand et al. (2004) reported that nurses felt more in control over pain, they felt able to provide a better pain management, after the intervention. Nurses verbalized feeling more empowered and in control in pain management and positively evaluated the interventions aimed to change their attitudes (Ferrell et al., 1993; Idell et al., 2007).

Role Model or Specialist—Role models and specialists were found to be highly valuable to nurses in the two studies. Wells et al. (2001) found that nurses more than physicians reported satisfaction and valued working with Palliative Care specialists (2001). The PRNs (Pain Resources Nurses) reported to be more empowered and have better understanding of interdisciplinary pain management approaches but still reported to struggle work efficiently with coworkers and physicians when functioning in the PRNs roles (Ferrell et al., 1993).

Nurses who practice in inpatient settings and homecare also valued access to specialists and resources when dealing with and reviewing complex cases (Vallerand et al., 2004).

Pain Assessments and Documentation—Three studies evaluated behavior changes in pain assessment, reassessment and documentation (Bookbiner et al., 1996; De Rond et al., 2000a; Idell et al., 2007). A notable increased frequency in documentation of pain and pain assessment especially for intensity, location, duration and factors that alleviate or decreases the pain, as well as pain relief measures provided, were found in two studies (Bookbiner et al., 1996; De Rond et al., 2000a). Another study found the pain reassessments frequency and comprehensiveness increased from pre- to post- intervention, however this improvement did not reach statistical significance (Idell et al., 2007).

Discussion

Participants and Aim

Nurses participating in nine studies provided pain management to adult cancer patient populations. The adult cancer population included older adults, but not one study was focused on the unique needs of older adults. Since the original aim was to explore the effectiveness of interventions to barriers to pain management in nurses working with this particular population group, the inability to accomplish this goal is a limitation of this review.

Design

All studies included in this review were experimental, with a specific intervention implemented and manipulated to influence knowledge, attitude and/or behavior change. Most studies did not employ randomization limiting ones ability to determine if the intervention was the source of improvements. Only two studies had control groups (Gustafsson &Borglin, 2013; Vallerand et al., 2004). Inadequate sample sizes, attrition pre and post intervention, or inability to recruit needed number of nurses limited the ability for several studies to reach statistical significance (Bookbinder et al., 1996; Ferrell et al., 1993, Vallerand et al., 2004, Wells et al., 2001). Also, all studies used convenient samples of nurses. Most of them were self-selected or forced to participate (Bookbiner et al., 1996), producing possible selection bias. Some studies used modified versions of tests and their own tools. However, authors reported the validity and reliability of the newly formed instruments (Gustafsson & Borglin, 2013; Idell et al., 2007; McMillan et al., 2005; Vallerand et al., 2004).

Findings

There were not any apparent differences in reported knowledge, attitudes, perceptions, and behaviors results between studies that employed the educational intervention only and the educational intervention with a role model/change leader. The results indicated that knowledge, attitudes, perceptions of role leaders, and behavioral changes as measured by pain documentation and pain reassessment seemed to be positively influenced and changed by various interventions. However, since statistical significance was obtained by a small number of studies, the interventions' effectiveness remains questionable.

Knowledge was easier to manipulate than attitudes. All participants gained knowledge on pain management as evidenced by increase in scores on post-tests. Attitudes were harder to influence and manipulate. Attitudes, in particular trust, affected nurses' perception of working with palliative specialists (Wells et al., 2001). However, since most studies did not have control groups it is hard to tell if the interventions were highly effective, or whether the results were affected by other factors. Also, all studies implemented different educational programs or approaches and by that, limiting the ability to compare and contrast the intervention and consequently the results.

Wells et al. (2001) found that nurses were more responsive to learning from a Palliative Care team and the relationship strengthened the learning processes and consequently outcomes. Furthermore, the authors speculated that teamwork and trust were predictive of the learning by noticing that the palliative care team did not succeed on wards where trust was compromised between team members (Wells et al., 2001). Nurses also positively received the presence of the advance practice nurse in supporting practice change in pain management (Idell et al., 2007). These findings match recommendations suggested by Kwon on overcoming barriers in nurses by providing education and the presence of palliative care specialists (2014). Two studies indicated that PRNs could be effectively educated and bring positive change in pain practices for oncology nurses (Ferrell et al., 1993; McMillan et al., 2005). However, the researchers did not evaluate if the presence of PRNs on the unit would bring the same results for other staff nurses as the presence of palliative specialists.

Out of nine studies, only three measured behavior change by looking at pain documentation and assessment and reassessment practices. Behavior change and the action it produces is an important outcome measure. As noted by Kwon, there is a "discrepancy" in health care professionals between what they think they know and what they actually practice (2014). Hence, measuring behavior is imperative due to practical implications and obtaining the true picture of providers' pain management practices. Finding only three studies that measured this outcome is limiting in concluding whether the interventions resulted in noticeable positive practice change.

Conclusions

Pain in cancer patient populations continues to be a major problem. With life expectancy increasing and the number of older people on the rise, the occurrence of pain in cancer patients will increase as well. Ways to overcome barriers to healthcare providers and interventions to improve pain management for cancer patients are needed. This critical review summarized findings from nine studies that implemented interventions aimed to overcome barriers in nurses to provision of effective pain management to cancer patients. The review concludes that available interventions may be effective in knowledge improvement, but not so in attitudes. Specialists and role models for pain practices are valuable to nurses, especially when trusting relationships are established. Finally, interventions that measure behavior changes such as assessment, documentation, and delivery of pain management interventions are needed. More research is needed to verify and replicate the findings, especially in older adults with cancer pain.

Implications for nursing

The number of studies that tested interventions for overcoming the barriers in nurses to provision of more effective pain management is small. Studies adequately powered to test the intervention and use of randomized control designs are needed to confirm if the interventions hold their effectiveness over time and if the results can be replicated. Also, innovative approaches and models are needed to provide new solutions and creative ways to change current practices, attitudes, and beliefs.

The original goal of the review was to describe provider related barriers to cancer pain management in older adults. Not even one study in this critical review tested interventions designed to address the unique barriers to pain management experienced by older adults with cancer. Since older adults are a growing and vulnerable cancer patient population that will experience pain, they will require effective interventions and models to employ to deal with this issue effectively. Research studies are needed to verify the barriers and evaluate interventions aimed at nurses working with older adults with cancer pain.

Knowledge Translation

The understanding of interventions that work in overcoming barriers to effective pain management can provide useful information for nursing educators, administrators and policyholders when implementing educational programs for nurses. Improved educational programs will assist nurses to utilize pain management skills and provide better pain care. Finally, this enhanced knowledge translation can contribute to improved pain outcomes for cancer patients.

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Table 1

Review of Studies

Authors, Year, Title	Methods	Participants and Settings	Study Designs and Intervention (I) and Control (C)	Outcomes	Major Findings Results
Bookbinder et al. (1996) *Implementing National Standard for Cancer Pain Management Program Model and Evaluation*	Quasi-experimental design Follow up: 2 years for knowledge outcome measures and specific CQI in year 3	**Total:** 1210 Demographics: 96.8% Female; mean age 32.8 (SD 8.9); mean number of years in nursing 8.5, SD 8.1; mean number of years in a hospital 5.7, SD 5.3; diploma 30.1%; BSN 51.2%; masters or doctoral 18.5%. Setting: 12 impatient units in a 565-bed tertiary care center	**I:** Pain Management Program, addressed structure, education, and a systematic method for problem solving.	*Nurses' Pain Knowledge and Attitude (NPKA)* Focus Groups Continuous Quality Improvement (CQI)	**NPKA:** Statistical significance was seen in visible documentation of pain and pain relief and unit based education for nurses. Appositive increase was found in all 46 items, with greater than 5% increase for 20 (44%) of the items. Focus groups identified two highest barriers: managing complex patients and the fear in causing harm in medically compromised patients, especially with decreased respirations.
De Rond et al (2000a) *A Pain Monitoring Program for Nurses: Effects on Communication, Assessment, and Documentation of Patients Pain*	A quasi-experimental design with a nonequivalent group. Follow up: 1 month	**Total:** 216 **Demographics**: Age mean 34.6; SD 8.9; Female 81.3%; years of experience 10.5; SD 8.2; educational level RN 69.4%; RN with specialized continuing education 30.6% **Setting:** Three Dutch Hospitals, in each hospital 2 surgical wards and 1 medical ward	I: 3-hour pain monitoring program (PMP) educational program and implementation of daily pain assessment.	*Quality of Nurses' Pain Assessment* Range: +1 (overestimation) −1 (underestimation) Pain documentation	**NRS:** Pre-PMP implementation, patients gave score of 2.9, SD 2.5; nurses score 3.3, SD 2.4, $p < 0.001$. After PMP, levels of agreement between patients' and nurses' ratings of the patient pain intensity increased from 43.6% in the control group to 67.8% in the intervention group, $p < 0.01$. Overestimation, 18.4%, as well as underestimation, 13.8%, declined in the intervention group compared to the control group. Pain documentation: After PMP, the mean documentation score significantly increased for pain intensity, $p<0.001$, pain location $p<0.05$, and pain duration $p<0.05$. The total mean documentation and the mean documentation per day also increased after implementation of the PMP, $p<0.01$ and $p<0.05$.
De Rond et al (2000b) *A Pain Monitoring Program for Nurses: Effects on Nurses' Pain Knowledge and Attitude*	A quasi-experimental design with a nonequivalent group. Follow up: 6 months	**Total:** 216 Demographics: Age mean 34.6, SD 8.9; female 81.3%; years of experience 10.5, SD 8.2; educational level RN 69.4%; RN with specialized continuing education 30.6%. Setting: Three Dutch Hospitals, in each hospital 2 surgical wards and 1 medical ward	**I:** 3-hour pain monitoring program (PMP) educational program and implementation of daily pain assessment.	*Pain Knowledge Questionnaire- Dutch Language Version (PKQ-DLV)* Range: o to 100 *Pain Attitude Inventory (PAI)* Range: 9-item questionnaire with 5-point Likert scale	**PKQ-DLV:** Pre-PMP 69.1%, SD 13.2; posttest 75.8%, SD 11.5, $p<0.001$. Age ($R2=0.08$, $p<0.001$) and additional pain courses ($R2=0.06$, $p<0.01$) were predictors for pain knowledge. **PAI:** After the PMP, the proportion of nurses who thought they have sufficient knowledge and skills to relieve pain increased from 57.7% to 73.6% ($p<0.01$). At pretest 78.3% believed nurses paid enough attention to patient's complaint of pain, 84.7% agreed to it after the posttest ($p<0.05$); 87.4% nurses agreed that pain should be assessed on daily basis, and on posttest only 77.1% agreed

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Authors, Year, Title	Methods	Participants and Settings	Study Designs and Intervention (I) and Control (C)	Outcomes	Major Findings Results
					(p<0.5) (the drop occurred mainly in the surgical nurses). (p<0.5) (the drop occurred mainly in the surgical nurses).
Ferrell et al. (1993) *The Pain Resource Nurse Training Program: A Unique Approach to Pain Management*	Experimental Follow up: 3 months	**Total:** 26 **Demographics**: Age, mean 38; 100% Female; education AA/AS 61%; BA/BS 27%; year in nursing mean 9, range 2 to 21; ethnicity Asian 11.5%; Black 4%; Caucasian 69%; Filipino 11.5%; Hispanic 4%; number of hours employed per week, mean 37, range 10–60	**I:** 20 hours didactic and clinical pain management course for staff nurses. The Pain Resource Nurse (PRN) Training Program, after completion of the course staff were available for PRN to assist with implementation and encountered problems	*Nurses' Knowledge and Attitude Survey* Daily subjective evaluations of the speaker and content. A subjective questionnaire was designed to collect information on role implementation issues and use of pain management knowledge in clinical practice.	**Nurses' Knowledge and Attitude Survey:** Pretest average 58.4%; posttest average 74%. Daily subjective evaluations of the speaker and content: participants pleased with the course and recommended it to other nurses. A subjective questionnaire: 61.3% nurses did not see any change in the number of patients in pain under their care, their attitude toward patients in pain, and the amount of teaching to both patients and coworkers increased. The nurses continued to have problems with coworkers 69.2% and physicians 69.6% when trying to implement the PRN duties, but most nurses 92% have better understanding how other departments can assist them in caring for the patient in pain.
Gustafsson & Borglin (2013) *Can a Theory-Based Educational Intervention Change Nurses' Knowledge and Attitudes Concerning Cancer Pain Management? A Quasi-Experimental Design*	A quasi-experimental design with non-equivalent control group. Follow up: 4 weeks and 12 weeks	**Total:** 40 completed initially 33 in intervention group and 27 in control. **Demographics**: Age range <30 to 40; mean I: 38; C: 36.8; 100% Female; working experience mean I: 10.2, SD 2.4; C: 9.4; SD 7.5; Diploma: I: 24%; C: 33%; Degree: I: 76%, C: 67%. **Settings:** two surgical wards in Sweden that frequently provided cares for cancer patients	**I:** (1) Theory-based educational intervention based on principle of Ajzen's Theory of Planned Behavior and interactive learning workshops (2) The introduction and implementation of guidelines for daily and systematic pain assessment using VAS	Demographic information. Modified version of *Nurses Knowledge and Attitudes Survey Regarding Pain (NKAS)* Range: 0 to 38	**NKAS:** I: baseline 67.0, SD 11.2; C: 67.8, SD 8.1. 4 week I: 73.7, SD 9.6, p=0.028 (p<0.05 is significant); C: 71.8, SD 9.5 (p=0.671).
Idell et al. (2007) *Alignment of Pain Reassessment Practices and National Comprehensive Cancer Network Guidelines*	A quasi-experimental study Follow up: 7 and 9 months	**Total:** 42 one group (27 medical oncology nurses and 15 surgical oncology nurses) **Demographics:** Age range: 20 to 60; 50% 41 to 50 yo; Asian (38%), Caucasian (36%); 93% Female; 10% diploma; 43% AD; 48% BSN; mean years in nursing 14.9; mean in cancer center 9.3. **Setting:** National Cancer Institute comprehensive cancer care in the western United States.	Research Utilization Model under APN leadership. Individual performance feedback and a review of pain documentation from five charting entry for each nurse with a plan for unit specific plan for improvement. Posters on the unit.	*Demographic Survey Tool* Included: gender, age, ethnicity, years in nursing, years at institution, education background, length of time on the current unit *The Nurses' Knowledge and Attitudes Survey Regarding Pain (NKASRP)* Range: 0–39 *The Pain Reassessment Data Tool (PRDT)* Range: 0–11 *The Pain Competency Valuation (PCE)* Range: 1–4	**Demographic Survey Tool:** The pre-intervention age range with the highest percent reassessment was 41 to 50 years. The post intervention age range with the highest percent reassessment was 20 to 40 years. The greatest learning was in the most experienced nurses (26 to 41 years old) and diploma nurses learned the least, only 10% improvement. **PRDT:** Pre-intervention 61%; post-intervention 78%, p = 0.004. **PCE:** Pre-intervention 3.05; post-intervention 3.38, p = 0.000

Authors, Year, Title	Methods	Participants and Settings	Study Designs and Intervention (I) and Control (C)	Outcomes	Major Findings Results
McMillan et al. (2005) *Training Pain Resource Nurses: Changes in Their Knowledge and Attitudes*	Pre and Post experimental design, nurses volunteered to be (Pain Resource Nurses) PRN. Follow up: immediately after the course	**Total:** 18 RN from multiple floors working with cancer patients. **Demographics**: Average age 43.1; SD 10.6; 89% Female; Associate Degree (AD) 17%; diploma 22%; BSN 50%; Masters 11%. **Setting:** A Veterans Administration hospital in the southeastern United States.	Intervention, a 32-hour intensive pain management course for PRN at a nearby university. Pretest was done before the course and posttest after completion of the course.	*Pain Management Principles Knowledge Test (PMPKT)* Range: 0 to 31 *Nurses' Attitude Survey* Range: 25 to 100 *The Pain Survey* Range: 0–18 *Demographic Data :* gender, age, ethnicity, education, shift worked, whether the nurse was an oncology nurse	**PMPKT:** Pretest 20.8 (67%); posttest 24.9 (80%), $p < 0.001$. Attitudes toward patients in pain pretest 11.8 (66%); posttest 15.6 (87%), $p < 0.007$. Attitudes toward pain management pretest 66.6; posttest 69.3, $p < 0.055$.
Vallerand et al. (2004) *Improving Cancer Pain Management by Homecare Nurses*	A longitudinal multilevel, randomized, controlled clinical trial, 11 agencies were cluster randomized. Follow up: 4 to 6 weeks.	**Total:** 202 (I: 100 C: 102) nurses from homecare agencies working with cancer patients. **Demographics**: age 24- 71, mean 44.4; 4% practical or vocational RN; 46% diploma or AD; 44% BSN; 6% Master degree; 39% more than 20 years of nursing experience; 97% Female; 87% Caucasian; 66% married. **Setting:** Homecare agencies in Midwestern region.	I: Two power over pain (POP) programs 4 to 6 weeks apart C: An explanation of the study and offered on intervention after six months in the trial	*Demographic Data Barriers Questionnaire (BQ)* Range: 0 to 5 for specific subscales. *Nurses' Knowledge and Attitude Survey Regarding Pain (KAS)* Range: 0 to 39 *Perception of Control Over Pain (PC)* Range: 1 to 7	**BQ:** I: baseline: 19.58, SD 8.85, four-week post- test 19.93, SD 8.51 C: baseline: 19.90, SD 8.30, four-week post-test 21.25, 9.08 **KAS**: I: baseline: 29.29, SD 4.74, four-week post- test 33.44, SD 3.38 C: baseline: 26.70, SD 4.22, four-week post-test 28.06, SD 3.95 **PC**: I: baseline: 2.67, SD 1.65, four-week post -test 2.43, SD 1.54 C: baseline: 3.40, SD 1.65, four-week post-test 3.55, SD 1.57
Wells et al. (2001) *The Knowledge and Attitudes of Surgical Staff Toward the Uses of Opioids in Cancer Pain Management: Can the Hospital Palliative Care Team Make a Difference?*	Qualitative exploratory. Follow up: 1 year	**Total:** 103 nurses completed the baseline questionnaire and 79 second set. **Demographics:** 75% Female (nurses mixed with doctors); age range 23 to 58, mean 35, experience of cancer pain in friend 30%; experience of cancer pain in family member 57% **Setting:** The United Kingdom	I: Two questionnaires Series of teaching sessions and informal teachings when patients were cared for by palliative team.	*Knowledge Scores* Range: 15 to 75 (The best possible being 15) *Attitudes Scores* Range: 0 to 99 (0 being best)	**Knowledge Scores:** Baseline: mean 34.58, SD 6.14; follow-up: mean 31.66, SD 6.50. **Attitude Score**: Baseline: mean 22.51, SD 10.47; follow-up: mean 19.37, SD 10.76.

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Table 2

Outcome Measures

Outcome Measures: Authors, year	Knowledge	Attitudes	Specialist Influence on Pain Management	Pain Assessment and Documentation
Bookbinder et al. (1996)	X	X		X
De Rond et al. (2000a)	X	X		X
De Rond et al. (2000b)	X	X		
Ferrell et al. (1993)	X	X		
Gustafsson & Borglin (2013)	X	X		
Idell et al. (2007)	X	X	X	X
McMillan et al. (2005)	X	X		
Vallerand et al. (2004)	X	X		
Wells et al. (2001)	X	X	X	