Training Pain Resource Nurses: Changes in Their Knowledge and Attitudes

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Purpose/Objectives: To determine the changes in knowledge and attitudes of pain resource nurses (PRNs) as a result of an intensive pain management course.

Design: Pre- and post-test design.

Setting: A Veterans Administration hospital in the southeastern United States.

Sample: 18 RNs from multiple units where care is provided for veterans with cancer.

Methods: The PRNs were tested before and after a 32-hour intensive pain management course.

Main Research Variables: Knowledge about pain management, attitudes toward pain management, and attitudes toward patients in pain.

Findings: Significant improvements were found in pain knowledge and attitudes toward patients in pain. Improvements in attitudes toward pain management approached significance.

Conclusions: The improvements in scores not only supported the effectiveness of the course but also provided additional evidence of the validity of the assessment instruments.

Implications for Nursing: Courses such as this should be offered in other settings to encourage practicing nurses to provide better care to patients in pain and to serve as role models for their peers.

Key Points . . .

➤ The 32-hour training program improved pain knowledge and attitudes in nurses.

➤ The results supported validity of the assessment tools.

➤ Continuing education in pain management should be offered in other settings.

Issues related to pain management in hospitalized patients with cancer have received much attention, with repeated studies indicating that patients continue to experience pain despite their pain management regimens (Davis & Walsh, 2004; Jubelirer et al., 1998; Levy, 1996; Maxam-Moore, Wilkie, & Woods, 1994; Yates et al., 2002). Although physicians order the types and doses of analgesics, nurses are in the best position to influence patients' pain from moment to moment. When patients complain of pain, nurses assess and manage the pain and teach patients about pain control. Nurses advocate for patients when medications ordered are not effective and can have a real impact on patients' pain management outcomes.

Many factors can lead to poor management of pain experienced by patients. Investigators have identified characteristics that may be related to reporting of pain by patients and assessment of pain by nurses. Characteristics of patients included severity of illness, gender, age, and ethnicity (Allcock, 1996; Berry, Wilkie, Thomas, & Fortner, 2003). Nurse characteristics included years of experience, age, and educational background (Allcock). Another area of research related to pain management has included nurses' beliefs and attitudes (Fothergill-Bourbonnais & Wilson-Barnett, 1992;

O'Brien, Dalton, Konsler, & Carlson, 1996). Other research has indicated that one reason for poor pain management involves nurses' lack of knowledge (Fothergill-Bourbonnais & Wilson-Barnett; Glajchen & Bookbinder, 2001; O'Brien et al.; Vortherms, Ryan, & Ward, 1992).

Research on the effectiveness of educational programs on pain management has been mixed. Camp-Sorrell and O'Sullivan (1991) found that education about pain management did not result in changes in nurses' behavior. McCaffery and Ferrell (1995, 1997) and Dahlman, Dykes, and Elander (1999) found that pain management education did have a positive impact on behavior. McCaffery and Ferrell (1999) found that although nurses have become more informed about pain assessment, they still lack the basic knowledge to manage pain appropriately. Gunnarsdottir, Donovan, and Ward (2003) called for research to determine which components of educational interventions are needed to improve pain management by nurses.

Research Objectives

The objective of the current study was to determine the effect of an intensive, weeklong pain management course on the knowledge and attitudes of unit-based nurses who were

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working with Veterans Administration (VA) inpatients with cancer and were recruited to be pain resource nurses (PRNs).

Literature Review

Knowledge and Attitudes About Pain Management

One explanation for nurses' inadequate management of pain has been lack of knowledge about pain assessment and management. McCaffery and Ferrell (1999) compared surveys conducted on practicing nurses in the United States from 1988–1990 and again in 1995. The authors found that although nurses became more informed about pain assessment and relief, many nurses still lacked basic knowledge about pain management. In a similar study, McCaffery and Robinson (2002) received 3,282 surveys from nurses about their knowledge of pain management. Only 4% of respondents answered all questions correctly. More than half of those surveyed received a score of less than 80%.

Other studies have been conducted to evaluate nurses' knowledge of and attitudes about pain management. Brown, Bowman, and Eason (1999) surveyed practicing RNs using the Nurses' Knowledge and Attitudes Survey. The mean score on the survey was 64.58%. Ten of the 35 items were answered incorrectly by half or more of the participants. The results of the study indicate knowledge deficits that may interfere with effective pain management.

Glajchen and Bookbinder (2001) conducted a national survey of 1,256 homecare nurses in the United States. On average, the nurses were able to answer only 56% of the pain knowledge items correctly. Although 63% of nurses correctly assessed their knowledge of pain management, 37% either over- or underestimated their competence. The nurses showed greater knowledge about pain assessment and less about pain management.

The Nurses' Knowledge and Attitudes Survey was used to question 514 nurses in a large Canadian teaching hospital (Brunier, Carson, & Harrison, 1995). The purpose of the study was to evaluate the nurses' knowledge of and attitudes about pain. The mean raw score was 19.21, with a mean percentage score of 41. Nurses who had attended an educational program on pain management scored higher on the tool than those who had not attended such a program. University-prepared nurses scored higher than those who were not university prepared. The nurses lacked knowledge about pain management principles, opioid use, and acute and chronic pain.

Effects of Educational Programs on Knowledge About Pain Management

Studies focusing on changes in pain management behaviors as a result of education are limited. Camp-Sorrell and O'Sullivan (1991) audited charts before and after a single continuing education program on pain. They found no significant improvement in documentation after the education. The findings suggest that short-term interventions are of little benefit in changing pain management behaviors. However, a longer course was reported to have greater benefit. A 40-hour didactic and clinical course designed to prepare PRNs was offered to 26 RNs in a clinical cancer center (Ferrell, Grant, Ritchey, Ropchan, & Rivera, 1993). Three months after the course, PRNs were more knowledgeable, had more positive attitudes, and exhibited more positive pain management behaviors than they had prior to the course. In addition, they worked actively to influence the pain management practices of their colleagues.

Other studies have focused on pain management education programs. Dalton et al. (1996) measured the effectiveness of a pain education program on nurses' knowledge and practices. The nurses' knowledge of cancer pain management increased, but the overall change was not statistically significant. An increase was found in documentation of pain assessment six months after the program.

The Nurses' Knowledge and Attitude Survey Regarding Pain was used to measure nurses' knowledge and attitudes about pain after an educational program (Erkes, Parker, Carr, and Mayo, 2001). Results indicated a significant change in nurses' knowledge and attitude scores from baseline to postintervention. In a similar study, Howell, Butler, Vincent, Watt-Watson, and Stearns (2000) found an increase in nurses' knowledge and a change in attitudes after an educational intervention. However, the effect was not sustained over time.

Summary

Much information has been disseminated in the literature about pain management, but the results of the studies indicate that nurses still lack knowledge and harbor unsuitable attitudes about appropriate pain management practices. Studies looking at changes in pain management behavior as a result of nursing education are limited. Those that have been conducted involved short-term programs, and results were not encouraging.

The results from the studies found in the literature review indicate the need for more education, not only in basic nursing curricula but also in continuing education programs for practicing nurses. The current article reports results of a continuing education program for nurses caring for veterans with cancer.

Methods

The project used a pre- and post-test design. The advanced training in pain assessment and management was provided to a group of staff nurses who had volunteered to become PRNs. The nurses were chosen from staff RNs based on education, nurse manager recommendation, education related to pain management, and interest. The training was provided so that PRNs could function in that role for a year as part of a clinical trial. The PRN program was modeled after the one developed and published by Ferrell et al. (1993).

Settings

The nurses in the sample worked at a 681-bed VA hospital with 1,800 cancer-related admissions each year and 623 new cancer diagnoses annually. The hospital had a chronic pain management team whose primary focus was chronic nonmalignant pain and an inpatient chronic pain program. However, none of the nurses chosen was from the pain program, and the pain program is separated physically from the inpatient areas where patients with cancer receive care.

Sample

The target sample for the study was a minimum of 12 nurses to allow one PRN from each of four units and each of three shifts. This provided maximum opportunity for role modeling around the clock. If additional nurses volunteered and they seemed to be appropriate for the project, the researchers determined that more than 12 could be trained.

Instrumentation

Pain Management Principles Knowledge Test: The Pain Management Principles Knowledge Test (PMPKT) is a 31-item cognitive examination designed to test knowledge of pain management principles. The format is multiple choice, with four choices per item. The content of the test includes physiology, pharmacology, and characteristics of pain; addiction; dependence; tolerance; goals of pain management; and principles of pain assessment and management. Raw scores range from 0–31, and percentage scores may range from 0–100, with 100 indicating that all questions are answered correctly. The PMPKT was built based on a blueprint and a careful review of the literature that offered beginning evidence of content validity (McMillan, Tittle, Hagan, Laughlin, & Tabler, 2000).

Validity was assessed by pre- and post-testing. Scores of 28 senior nursing students before and after a three-hour pain management course were compared. The significant increase in pre- to post-test scores (t = 6.76, p = 0.00) further supported the validity of the scale. Test-retest reliability with a one-week delay was assessed using the same 28 students. The resulting reliability coefficient was acceptably high (r = 0.84, p = 0.00), which supported the reliability of the PMPKT (McMillan, Tittle, Hagan, Laughlin, & Tabler, 2000).

Nurses' Attitude Survey: The Nurses' Attitude Survey is a 25-item instrument that assesses attitudes about pain management. It was developed by revision of the Nurses' Knowledge and Attitudes Survey (B.R. Ferrell & C. Leek, personal communication, February 26, 1992). Only the 25 attitude items were used. The survey is a summated rating scale, with scores that range from 25–100, with higher scores reflecting more positive attitudes. Attitudes assessed include those about pain as well as attitudes about the use of opiates (e.g., fear of addiction, sedation, respiratory depression, scheduling), who is in control, and the use of nonpharmacologic methods for pain relief.

Development of the original tool: Developing the items for the original tool from a review of literature and pain standards ensured content validity. In addition, a panel of nurses evaluated the original items. The developers used a comparison of scores of nurses at varied levels of expertise (students, new graduates, oncology nurses, graduate students, and senior pain experts) to evaluate the original tool's construct validity. The tool was able to differentiate among the groups; thus, its validity was supported. The developers also evaluated the reliability of the tool using two methods. First, internal consistency was evaluated using Cronbach's alpha (r = 0.70). Second, test-retest reliability with a group of 60 nurses resulted in an acceptably high correlation coefficient (r = 0.80) (B.R. Ferrell & C. Leek, personal communication, February 26, 1992).

Revised tool: Validity and reliability of the revised instrument were evaluated. A group of 28 senior nursing students took the Nurses' Attitude Survey before and after a three-hour pain education course. The significant difference that resulted (t = 6.88, p = 0.00) supports the construct validity of the revised instrument. Test-retest reliability with a one-week delay was assessed using the same 28 nursing students. The resulting correlation coefficient was high (r = 0.89, p = 0.00). Internal consistency using Cronbach's alpha (r = 0.86) also was high (McMillan, Tittle, Hagan, Laughlin, & Tabler, 2000).

The Pain Survey: The Pain Survey is an 18-item questionnaire that assesses attitudes of nurses toward patients in pain who are receiving opiates; the attitudes include those toward age, gender, and relevance of behavior and mood. The survey consists of brief case presentations and multiple-choice items. Each case is a vignette involving two patients and is designed to evaluate one attitude toward patients in pain. One vignette deals with age bias, and another deals with patient behavior or mood. Nurses are asked to respond to three questions following each patient presentation. For each of the four patients, nurses are asked to rate pain, select a dose of medication to administer from a range of doses, and identify concerns that influenced their responses to the prior questions (McCaffery & Ferrell, 1991a, 1991b, 1992). In addition to the case study vignettes, six items are used to measure gender bias. Respondents are asked whether men and women differ in their sensitivity or tolerance to pain, their pain distress, and their reporting of pain. Scores range from 0–18, with higher scores representing more positive attitudes (least likelihood of reflecting bias in pain management because of age, gender, or patient behavior).

The items in the vignettes and gender items were developed based on a literature review and items in other tools used by McCaffery and Ferrell (1992). Therefore, some beginning evidence of construct validity was ensured. In addition, a panel of pain experts reviewed the vignettes and items to ensure that they measured relevant attitudes. The original tools then were pilot tested with large groups of nurses. The developers used contrasting groups and evaluation of test-retest reliability.

The validity and reliability of the newly combined instrument, the Pain Survey, were evaluated. Senior nursing students (N = 26) were tested before and after a three-hour pain management course designed to change attitudes. The significant improvement in scores (t = 2.01, p > 0.05) supported the construct validity of the survey. Using post-test scores of the same 26 students, test-retest was used to evaluate reliability. The resulting reliability coefficient (r = 0.73, p = 0.00) supports the stability of the tool (McMillan, Tittle, Hagan, Laughlin, & Tabler, 2000).

Demographic data: Standard demographic data were collected to describe the PRNs, including gender, age, ethnicity, basic nursing education, highest level of education, shift worked, and whether the nurse was an oncology nurse.

Procedures

The larger clinical trial was approved by the Research and Development Committee at the VA hospital and by the institutional review board of the affiliated university. Before data collection, the study was explained to the nurses, questions were answered, and informed consent forms were signed. Each nurse was given a copy of the consent form to keep.

Unit managers were asked to assist with identifying potential PRNs. Nurses also were invited to self-identify. After selection, the PRNs were invited to attend an intensive, 32-hour pain management course in a classroom at the university that is adjacent to the hospital. Faculty included a pain nurse practitioner and two university faculty members whose areas of research included pain assessment and management. Pretesting was performed before the beginning of the instruction, and post-testing was completed immediately after the end of the course. The pretest answers were not reviewed with the students after the initial testing. An outline of the course content is presented in Figure 1.

- Prevalence of pain
- Types and causes of pain in people with cancer
- Physiology of pain
- Impact of the pain
- Pain assessment
- Pain management
  - Pharmacologic methods
  - Nonpharmacologic methods
- Attitudes that influence the nurse's response to patients in pain
- Involvement of patient and family
- Role of the pain team
- Application of pain standards
- Quality assurance related to pain management
- Methods to facilitate change on the units

Figure 1. Content Included in Pain Resource Nurse Training Course

Data Analysis

Demographic data were analyzed using frequencies, percentages, means, and standard deviations. The pre- and post-test item and total scores for each of the three measures were examined with means, standard deviations, and paired t tests.

Results

Sample

A total of 18 nurses participated in the PRN program; most were female (see Table 1), with an average age of 43.1 years (SD = 10.6). The group of PRNs generally was well educated, with the majority having either baccalaureate or master's degrees (61%).

Knowledge and Attitude Scores

Results of knowledge and attitude scores are presented in Table 2. Initial knowledge scores were close to a passing level at 20.8 (67%). However, they improved significantly ($p < 0.001$) to 24.9 (80%). Scores on the measurement of attitudes toward patients in pain were low (11.8, 66%). Those scores also showed significant improvement ($p < 0.007$) by increasing to 15.6 (87%).

Attitude toward pain management scores did not show as marked an improvement. The pretest mean was 66.6, whereas the post-test mean was only 69.3. This result approached significance ($p < 0.055$).

Item Analysis

The test results were broken down using item analysis to determine where the PRNs' strengths were prior to the course and where the course had the greatest impact. Data are presented separately for knowledge and attitudes.

Knowledge scores: Numbers of PRNs answering knowledge items correctly pre- and post-test are presented in Table 3. Lower scores tended to be on items related to physiology and pharmacology, whereas higher scores were found on item 1, about calling the physician if pain is unrelieved; item 2, that the patient is the best judge of pain and should be in control of pain management; and item 3, that steady state analgesia increases patient comfort (see Table 4).

Table 1. Demographic Data

Variable	n	%
Gender		
Female	16	89
Male	2	11
Basic nursing education		
Associate degree	3	17
Diploma	5	28
Baccalaureate degree	10	56
Highest level of education		
Associate degree	3	17
Diploma	4	22
Baccalaureate degree	9	50
Master's degree (non-nursing)	2	11

N = 18

Note. Because of rounding, percentages may not total 100.

Attitudes toward patients in pain: Items related to attitudes toward patients in pain are presented in Table 5. Generally, the PRNs indicated that regardless of patient behavior or age, they would record the pain score reported by the patient. However, at the pretest, 16 PRNs (88%) would reduce the opiate dose for a man who was laughing with visitors, and 7 (39%) would reduce the dose for a man who was grimacing. Ten of the PRNs (56%) would reduce the dose of opiate for a 30-year-old man with stable vital signs and unrelieved pain, whereas 14 (78%) would reduce the dose for the same scenario if the man was 75 years old. Most of the percentages improved noticeably on the post-test. Concern about addiction, sedation, or respiratory depression was expressed by 5 (28%) of the PRNs related to a 25-year-old with abdominal surgery who was smiling and by 8 PRNs (44%) for the man who was grimacing. For the younger and older men with fractures, 6 (32%) of the PRNs had such concerns for the younger man, whereas 8 (44%) had the concerns for the older man. The scores improved on the post-test.

Related to gender, on pretest, 8 (44%) of the PRNs believed that a difference existed in pain tolerance between men and women and 9 (50%) believed a difference existed in pain reporting. Eleven (61%) PRNs indicated a difference in nonverbal expression between men and women. All of those scores also improved on the post-test.

Attitudes toward pain management: On the pretest, the PRNs revealed a number of negative attitudes toward patients in pain (see Table 6). Only 50% believed that patients have a right to expect total pain relief. Only 33% believed that patients with severe chronic pain need higher doses compared to those with acute pain. Less than a quarter of the PRNs (22%) believed that patients on as-needed analgesics should request an analgesic before pain returned. On the negatively

Table 2. Pre- and Post-Test Mean Scores of Nurses on Knowledge and Attitude Measurements

Measurement	Pretest	Post-Test	t	p
Pain knowledge	20.8	24.9	7.50	< 0.001
Attitude toward patients in pain	11.8	15.6	3.06	< 0.007
Attitude toward pain management	66.6	69.3	2.10	< 0.055

Table 3. Knowledge Item Scores Showing Improvement

Item Content	Pretest		Post-Test	
	n	%	n	%
Physiology				
Opiate receptors	5	28	7	39
Role of C-fibers	5	28	9	50
Part of central nervous system (CNS) responsible for "gating"	12	67	16	89
Pharmacology				
Preferred route is oral.	10	56	15	83
IV drip provides steady state.	8	44	12	67
Opiate mechanism of action	11	61	14	78
Meperidine has CNS toxicity.	12	67	16	89
Action of naloxone	10	56	16	89
Tolerance				
Definition	16	89	18	100
Tolerance occurs normally.	13	72	15	83
Management				
Give analgesic before pain returns.	3	17	15	83
Goal is complete pain relief.	7	39	11	61
Backrub or heat is cutaneous stimulation.	12	67	16	89
Quality of life in palliative care	15	83	16	89
Indication for cutaneous stimulation	12	67	13	72
Assessment				
Nurse cannot report pain, only patient.	6	33	10	56
Symptoms of chronic pain	15	83	17	94
Likelihood of addiction	13	72	17	94

N = 18

Table 5. Scores on Attitudes Toward Patients in Pain

Item Content	Pretest		Post-Test	
	n	%	n	%
Vignette A				
Charting patient pain	16	89	18	100
Choosing opiate dose	4	22	15	83
Concerns about the patient	13	72	15	83
Vignette B				
Charting patient pain	17	94	18	100
Choosing opiate dose	11	61	15	83
Concerns about the patient	11	61	15	83
Vignette C				
Charting patient pain	17	94	17	94
Choosing opiate dose	8	44	15	83
Concerns about the patient	12	67	15	83
Vignette D				
Charting patient pain	18	100	16	89
Choosing opiate dose	4	22	15	83
Concerns about the patient	10	56	14	78
Differences in sensitivity in men and women	15	83	17	94
Tolerance in men and women	10	56	15	83
Pain distress in men and women	12	67	16	89
Pain reporting in men and women	9	50	12	67
Pain exaggeration in men and women	14	78	17	94
Nonverbal expression in men and women	11	61	15	83

N = 18

Note. Vignette A involves a 25-year-old male with abdominal surgery who is smiling and talking, vignette B involves a 25-year-old male with abdominal surgery who is grimacing, vignette C involves a 30-year-old male with a fractured hip and stable vital signs, and vignette D involves a 75-year-old male with a fractured hip and stable vital signs.

stated items (see Table 7), the majority believed that patients receiving around-the-clock opiates are at risk for addiction. All of the negative attitudes shifted markedly in the positive direction after the course.

The PRNs exhibited many more positive than negative attitudes on the pretest as well (see Tables 6 and 7). All of the PRNs (100%) agreed that nurses should be advocates for patients by calling a physician if pain is unrelieved, that lack of pain expression does not necessarily mean lack of pain, and that distraction and diversion are appropriate methods for decreasing pain perception. All of the nurses disagreed with the statement that nurses' assessments of patient pain are more accurate than patients' and with the statement that estimations of physicians and nurses are more valid than patients'. All but one of the PRNs (94%)

agreed that around-the-clock scheduling is superior, assessment is necessary for management, and cancer pain can be relieved. All of the scores increased to 100% agreement on the post-test. Ninety-four percent of the PRNs also agreed that patients and families may hesitate to ask for opiates because of their fears; the percentage remained stable on the post-test. Two of the attitude items showed a decrease from pre- to post-test. All but one disagreed on the pretest that increasing analgesic requirements and physical symptoms are signs of addiction; however, on post-test, two disagreed. On the item about cutaneous stimulation being effective only for mild pain, 13 (72%) disagreed on the pretest, but only 10 (56%) disagreed on the post-test.

Table 4. Knowledge Item Scores Showing No Improvement

Item Content	Pretest		Post-Test	
	n	%	n	%
Opiate duration of action	3	17	3	17
Symptoms of acute pain	8	44	7	39
Variables affecting expression of pain	16	89	14	78
Call physician if pain is unrelieved.	18	100	18	100
Patient is best judge of patient pain.	18	100	18	100
Patient should have most control.	18	100	18	100
Steady state increases comfort.	18	100	18	100
Use of distraction for pain	18	100	18	100
Choice of drugs for patient vignette	18	100	18	100

N = 18

Discussion

Sample

The sample was small but appropriate for the purposes of the project. The very small sample probably contributed to the researchers' failure to find a significant difference on one of the measurements.

As might be expected, the nurses were predominantly female and in their 40s. A majority of the PRNs in the sample had baccalaureate or master's degrees (non-nursing), making them better educated, in general, than the nurses in the staff nurse sample for whom they were to serve as role models (McMillan, Tittle, Hagan, Laughlin, & Tabler, 2000). The difference occurred by design. The PRNs were chosen, in part, for their interests and educational accomplishments. The sample was

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Table 6. Scores That Reflected Positive Attitudes Toward Pain Management

Item Content	Pretest		Post-Test	
	n	%	n	%
Strongly agreed or agreed that				
If pain is unrelieved, nurse should call physician.	18	100	18	100
Lack of pain expression does not mean lack of pain.	18	100	18	100
Distraction and diversion can decrease perception of pain.	18	100	18	100
Giving opiates on a regular schedule is preferred to as-needed scheduling.	17	94	18	100
Continuous pain assessment is necessary for effective pain management.	17	94	18	100
Patients and families may hesitate to ask for pain medications because of fears about opiates.	17	94	17	94
Cancer pain can be relieved with appropriate management.	17	94	18	100
Patients receiving opiates as needed are more likely to develop clock-watching behaviors.	13	72	14	78
Patients can be maintained pain free.	13	72	17	94
Patients with cancer and their families should have more control over opiate schedules than nurses.	13	72	17	94
Patients in pain can tolerate high doses of opiates without sedation or respiratory depression.	12	67	16	89
Patients have a right to expect total relief.	9	50	16	89
Patients with severe chronic pain need higher doses compared to those with acute pain.	6	33	10	56
A patient receiving opiates as needed should request an analgesic before the pain returns.	4	22	13	72

N = 18

Table 7. Scores That Reflected Negative Attitudes Toward Pain Management

Item Content	Pretest		Post-Test	
	n	%	n	%
Strongly disagreed or disagreed that				
The nurse makes a more accurate assessment of the pain than the patient.	18	100	16	89
Estimation of pain by a physician or nurse is more valid than patient self-report.	18	100	18	100
Increasing analgesic requirements and physical symptoms are signs of addiction.	17	94	16	89
Cutaneous stimulation is only effective for mild pain.	13	72	10	56
Patients should experience some discomfort prior to the next dose of analgesic.	14	78	17	94
Patients with pain relief and euphoria should receive lower doses of analgesic.	12	67	15	83
Patients receiving around-the-clock opiates are at risk for sedation and respiratory depression.	16	89	17	94
Patients receiving around-the-clock opiates are at risk for addiction.	3	17	16	89

N = 18

conducted in only one VA hospital in one geographic location, which limits the generalizability of the results.

Pain Knowledge and Attitudes

Total scale scores—knowledge: Knowledge scores of the PRNs were relatively high (67%) even at baseline, which probably was related to the selection process for the PRNs. They were chosen because of their higher levels of education and their interest in pain management. Their baseline scores were noticeably higher than the staff nurses in the same hospital, who had a mean baseline score of 61% (McMillan, Tittle, Hagan, Laughlin, & Tabler, 2000). Because they started out relatively high, their improvement was not as marked as it might have been otherwise. Although a significant improvement occurred in knowledge scores (p < 0.001), an increase to a mean of 80% is not impressive. The researchers anticipated a higher mean score and are unsure why the result occurred. Item analysis was conducted in an attempt to see in which areas the PRNs made the greatest improvements.

Item analysis—knowledge: The breakdown of the item scores helps to clarify why the scores increased only 4.1 points,

or 13%. For 6 of the 31 items, 100% of the PRNs entered the course knowing the right answers (see Table 4). On a seventh item, 83% of the PRNs answered correctly on the pretest. Thus, they had little or no room for improvement. On another three items (opiate duration of action, symptoms of acute pain, and variables affecting the expression of pain such as culture and religion), the PRNs either did not show any improvement or lost ground. The course developers need to look at the content of the course before it is offered again to see how it can be enhanced.

On the items related to physiology, although item scores increased, the change was minimal. The improvements in other item scores were more dramatic. Again, the course developers need to scrutinize the curriculum to see how it can be delivered better.

Total scores—attitudes toward patients in pain: Scores related to attitudes toward patients in pain increased significantly (p < 0.007). They also showed a slightly higher pretest mean (11.8, 66%) than the staff nurses (11.0, 61%) in the earlier study (McMillan, Tittle, Hagan, Laughlin, & Tabler, 2000). The increase in scores after the course was more marked than the knowledge increase, going from a pretest low of 66% to a post-test high of 87%. The results are encouraging and support the success of the course.

Item analysis—attitudes toward patients in pain: The most impressive item gains were on the instrument that measured attitudes toward patients in pain. The majority of the items showed an increase in the number of PRNs who answered correctly or in a positive direction. This seems to suggest that the course was successful in changing that particular set of attitudes. Results of the study support the findings of the earlier project by Ferrell et al. (1993), who found

that, after training, the PRNs were more knowledgeable and had more positive attitudes.

Total scores—attitudes toward pain management: Scores on the survey regarding general pain management attitudes were not as encouraging. The mean score was slightly lower for the PRNs on the pretest ($\bar{X} = 66.6$) than for the staff nurses ($\bar{X} = 71.8$) in the earlier study (McMillan, Tittle, Hagan, Laughlin, & Tabler, 2000). In addition, only a three-point gain occurred on a 25–100 point scale from pre- to post-test. Although the results approached significance, a larger improvement was expected. Again, item analysis was conducted in an attempt to understand which areas showed the greatest and least improvements.

Item analysis—attitudes toward pain management: A glance at the item analysis offers a partial explanation for why no significant difference was found between the pre- and post-test scores. For many of the items, a majority of the PRNs exhibited very positive attitudes on the pretest. In fact, 100% exhibited maximum positive scores on five of the items, with 94% exhibiting positive scores on another five items. The very high pretest scores left little room for improvement and probably resulted from the selection bias built into the study. The PRNs were chosen largely because of their educational accomplishments and their interest in pain management. Although a significant improvement was desirable, the fact that the course planners had selected a group of PRNs with such positive attitudes on the items was an excellent outcome. The selection criteria included that the PRNs have an interest in pain management; clearly, these nurses did. However, two items pulled scores down on the post-test. Too many of the PRNs disagreed that patients with severe chronic pain might need higher doses of opiates compared to patients with acute pain. This item required the PRNs to take into account the idea of tolerance to opiates. Only 56% got the item correct on the post-test. The other item that pulled the scores down on the post-test was about cutaneous stimulation being effective only for mild pain. The PRNs should have disagreed with this on the post-test, but only 56% did.

A qualitative interview was conducted with the nurses after they had served as PRNs on their units for a year. Results of the interviews indicated that the PRNs felt empowered in their own pain management and in mentoring their coworkers. The results are published on pages 843–848.

Although the course changed knowledge and attitudes, the intervention subsequently offered by the PRNs to the staff nurses was successful in changing pain management behaviors but not in improving overall pain intensity for patients. However, improvements were shown in severity of opioid-induced constipation and in assessment of pain using a rating scale. Other significant improvements included number of pain sites documented, side effects documented, and documentation of constipation. The results are being prepared for publication elsewhere (McMillan, Tittle, Hagan, & Laughlin, 2000).

Conclusions

The purpose of the project was to train PRNs to exemplify good pain management behaviors. The advanced course in pain management was successful in changing the knowledge and attitudes of the nurses who were chosen to serve as PRNs.

Limited resources are the order of the day in this time of shrinking budgets. In light of this, nurses will continue to have difficulty providing the quality care that hospitalized veterans have a right to expect. Thus, training staff nurses to serve as role models in many healthcare settings where pain is a problem could be a viable option. The course in the current study was effective in increasing the knowledge and attitudes of the nurses. After some revision based on findings, perhaps the course can be replicated in other settings to enhance the skills of staff nurses who then could support other staff nurses in assessing and managing pain as one way of improving utilization of existing resources.

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