

The PRO-SELF[®] Pain Control Program Improves Patients' Knowledge of Cancer Pain Management

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Purpose/Objectives: To evaluate the effectiveness of a psychoeducational program (i.e., PRO-SELF[®] Pain Control Program) compared to standard care in increasing patients' knowledge regarding cancer pain management.

Design: Randomized clinical trial.

Setting: Seven outpatient settings in northern California.

Sample: 174 outpatients with cancer and pain from bone metastasis.

Methods: Following randomization into either the PRO-SELF[®] or standard care group, patients completed the Pain Experience Scale (PES) prior to and at the completion of the intervention.

Main Research Variables: Total and individual item scores on the PES.

Findings: Total PES knowledge scores increased significantly in the PRO-SELF[®] group (21%) compared to the standard care group (0.5%). Significant improvements in knowledge scores for patients in the PRO-SELF[®] group were found on five of the nine PES items when compared to baseline scores.

Conclusions: The PRO-SELF[®] Pain Control Program was an effective approach to increase patients' knowledge of cancer pain management.

Implications for Nursing: The use of a structured paper-and-pencil questionnaire, such as the PES, as part of a psychoeducational intervention provides an effective foundation for patient education in cancer pain management. Oncology nurses can use patients' responses to this type of questionnaire to individualize the teaching and to spend more time on the identified knowledge deficits. This individualized approach to education about pain management may save staff time and improve patient outcomes.

Despite major advances in pain management, cancer pain is managed poorly in 80% of patients with cancer (Cleeland et al., 1994). The undertreatment of cancer pain results in decreased functional status, depressed mood, increased fatigue, and decreased quality of life (Cleeland et al., 1994; Ferrell, Wisdom, & Wenzl, 1989; Glover, Dibble, Dodd, & Miaskowski, 1995; Miaskowski, Zimmer, Barrett, Dibble, & Wallhagen, 1997). Early studies of undertreatment focused on the identification of patient (Cleeland, 1987; Dar, Beach, Barden, & Cleeland, 1992; Jones, Rimer, Levy, & Kinman, 1984; Lin & Ward, 1995; Riddell & Fitch, 1997; Ward et al., 1993), provider (Cleeland, Cleeland, Dar, & Rinehardt, 1986; Elliott & Elliott, 1991, 1992; Elliott et al., 1995; Ferrell, Eberts, McCaffrey, & Grant, 1991; Fife, Irick, & Painter, 1993), and system (Ingham & Foley, 1998; Jacox et al., 1994; Joranson, 1994; Payne, 2000) barriers to optimal cancer pain management.

Key Points . . .

- ▶ Outpatients with cancer have inadequate knowledge of pain management.
- ▶ Oncology nurses should assess patients' knowledge of cancer pain management using a standardized questionnaire.
- ▶ Oncology nurses should individualize patients' education about cancer pain management based on the results of a questionnaire that evaluates their baseline knowledge.

One of the major barriers to effective cancer pain management is patients' lack of knowledge regarding the principles of pain management. In addition, patients have misconceptions about tolerance, physical dependence, and psychological addiction (Ferrell & Schneider, 1988; Jones et al., 1984; Riddell & Fitch, 1997; Rimer et al., 1987; Yeager, Miaskowski, Dibble, & Wallhagen, 1995). In fact, work by Yeager et al. showed that outpatients with cancer, with and without cancer pain,

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Digital Object Identifier: 10.1188/04.ONF.1137-1143

achieved an average score of only 60% on the Pain Experience Scale (PES), a specific tool that measures patients' knowledge regarding cancer pain management (Ferrell, Rhiner, & Rivera, 1993). In addition, study results indicated that the two items on the PES that received the poorest scores were "it is better to give the lowest amount of medicines early on so that larger doses can be saved for later if the pain increases" and "patients are given too much pain medicine." These findings were replicated by Riddell and Fitch and highlight patients' limited knowledge regarding effective approaches for the administration of analgesics to achieve optimal cancer pain control.

Studies of the Effectiveness of Patient Education Programs

Despite the findings from the early descriptive work regarding patients' lack of knowledge about cancer pain management, only six studies since 1987 have tested the effectiveness of a variety of interventions to improve patients' knowledge regarding cancer pain management. Dalton (1987) conducted a randomized clinical trial (RCT) that evaluated the impact of a pain education program (PEP) on patients' knowledge and self-reports of pain intensity. Patients were recruited from an outpatient oncology clinic associated with a large teaching hospital and randomly assigned to an experimental ($n = 15$) or a control ($n = 15$) group. Prior to the PEP, patients completed a pretest consisting of a 15-item knowledge questionnaire that was developed by the investigator. The PEP covered pain perception and management, was conducted in a face-to-face session in the outpatient clinic, and required less than 60 minutes. Patients were given the opportunity to ask questions and practice skills after the educational session. The post-test questionnaire was administered 7–10 days following the PEP. Patients in the experimental group had significantly higher knowledge scores compared to patients in the control group ($p < 0.05$). However, no significant group differences were found in pain intensity scores.

Rimer et al. (1987) conducted an RCT using a Solomon Four Group design that evaluated the effectiveness of a PEP aimed at increasing adherence with a pain control regimen, increasing recognition and management of side effects, decreasing misconceptions about opioid tolerance and addiction, and decreasing pain intensity. Patients ($N = 230$) were recruited from the outpatient department of a comprehensive cancer center and from two community hospitals. The PEP consisted of nurse counseling and printed materials. The counseling session did not exceed 15 minutes, and printed materials contained individual information about each patient's pain control regimen.

The percentage of patients who correctly followed their medication regimen was significantly higher in the experimental group than in the control group (81% versus 61%, $p = 0.04$). In addition, patients in the experimental group were more likely to recall having been told how to take their medication around the clock (45% versus 23%, $p = 0.03$) and to adjust their dosage if necessary (48% versus 25%, $p = 0.03$). The experimental group participants were less likely to report that they had stopped taking their pain medication when they felt better (38% versus 57%, $p = 0.03$). A significantly higher percentage of patients in the experimental group was less fearful about addiction (95% versus 82%, $p = 0.02$) and tolerance (95% versus 75%, $p = 0.0002$) compared to those in

the control group. Lastly, patients in the experimental group reported no pain or mild pain more frequently than patients in the control group (44% versus 24%, $p = 0.07$).

In another RCT, Ferrell, Rhiner, and Ferrell (1993) examined the effectiveness of an educational intervention for older adult patients with cancer ($N = 40$) and their family caregivers. The PEP consisted of information about basic pain principles, as well as pharmacologic and nonpharmacologic management. Although the patients in the experimental group received a three-part PEP, those in the control group were given an instructional booklet. An RN provided the education during three home visits. Study outcomes were evaluated at one and four weeks after the educational visits. The investigators reported a significant increase in overall knowledge, as well as significant increases in knowledge regarding specific pain management principles such as the use of pain medication on a scheduled rather than on an as-needed basis ($p = 0.007$) and decreased fear of addiction ($p = 0.02$) in the experimental group. However, the magnitude of the change in overall knowledge scores and individual items on the PES could not be determined because the descriptive data on the PES scores were not provided.

In a follow-up study using a pre- and post-test design, Ferrell, Ferrell, Ahn, and Tran (1994) evaluated the effectiveness of a PEP with a sample of older adult patients with cancer pain ($N = 66$) and their family caregivers. Participants received the same intervention employed by Ferrell, Rhiner, and Ferrell (1993). The PES was used to measure knowledge about cancer pain management at baseline and one and three weeks after the intervention. The mean overall knowledge score on the PES at baseline was 54.2. The intervention resulted in a significant increase in overall knowledge. In addition, improvement was observed on all individual items in the PES. As in the earlier study, the magnitude of these changes could not be determined because postintervention scores were not reported.

In their RCT, de Wit et al. (1997) evaluated the effectiveness of a PEP among patients with cancer who were experiencing chronic pain. The PEP was conducted in one session by a nurse and focused on basic pain principles: pain management, how to keep a pain diary, how to better communicate with healthcare providers, and how to contact a provider. Patients were recruited from an inpatient oncology unit in a specialized cancer hospital. Patients were randomized to an intervention ($n = 159$) or control group ($n = 154$). Patients in the intervention group received the PEP in the hospital and by telephone at three and seven days after discharge. Pretest scores indicated that patients in both groups lacked knowledge about pain and pain management as measured by the PES. Two weeks after the intervention, the experimental group had a significant 12% increase in knowledge scores compared to the control group. In addition, significant increases in two of the items on the PES were noted (i.e., taking the lowest amount of pain medicine and around-the-clock versus as-needed dosing).

In the most recent RCT, Oliver, Kravitz, Kaplan, and Meyers (2001) evaluated the effects of an individualized education and coaching intervention on pain outcomes and pain-related knowledge among outpatients with cancer-related pain. Patients in the intervention group ($n = 34$) received a 20-minute individualized education and coaching session that was aimed at increasing knowledge of pain management, decreasing misconceptions about pain treatment, and rehearsing an individually scripted

patient-physician dialogue about pain control. Patients in the control group (n = 33) received standardized instructions about pain management. Data were collected at baseline and two weeks later. At the end of the study, patients in the intervention group reported significant decreases in average pain intensity. However, no differences were found between the two groups in functional impairment as a result of pain or in pain-related knowledge.

Five (Dalton, 1987; de Wit et al., 1997; Ferrell et al., 1994; Ferrell, Rhiner, & Ferrell, 1993; Rimer et al., 1987) of the six intervention studies demonstrated significant increases in patients' knowledge regarding cancer pain management. However, only one study (de Wit et al.) provided sufficient information to determine the magnitude of the increase in overall knowledge, and none of the five studies provided detailed information regarding the magnitude of the change in knowledge concerning specific aspects of cancer pain management. This type of detailed information has implications for planning future patient education studies. Therefore, the purpose of this study was to determine the effectiveness of a psychoeducational intervention called the PRO-SELF[®] Pain Control Program compared to standard care in increasing patients' knowledge regarding cancer pain management.

Methods

Sample and Settings

This study is part of a large RCT that evaluated the effectiveness of the PRO-SELF[®] Pain Control Program compared to standard care in improving cancer pain management (Miaskowski et al., 2004; West et al., 2003). Two hundred twelve outpatients with cancer were recruited from a university-based cancer center, two community-based oncology practices, one outpatient radiation therapy center, one health maintenance organization, one veteran's administration facility, and one military hospital, all in northern California. The study was approved by the Committee on Human Research at the University of California, San Francisco, and at each of the study sites. Only those patients (n = 174) who completed the study were included in this analysis. Some patients (n = 38) did not complete the entire study for a variety of reasons, including increased severity of illness, intervening cancer treatments that required hospitalization, and death. No differences were found in any of the demographic, disease, or baseline pain characteristics among patients who did and did not complete the study.

The participants were adult (> 18 years old) outpatients with cancer who were able to read, write, and understand English. All participants had a Karnofsky Performance Status (KPS) score of 50 or more, an average pain score of 2.5 or more on a 0–10 numeric rating scale (based on an average of seven days' baseline ratings of pain intensity), and radiographic evidence of bone metastasis.

Instruments

Patients completed a demographic questionnaire, the KPS rating scale (Karnofsky & Burchenal, 1949), and the PES (Ferrell, Rhiner, & Rivera, 1993). In addition, patients' medical records were reviewed for disease and treatment information.

The **demographic questionnaire** obtained information about age, gender, marital status, living arrangements,

education level, ethnicity, and employment status. Baseline information about patients' pain was obtained using a numeric rating scale ranging from 0 (no pain) to 10 (excruciating pain) for pain now and average, worst, and least pain. In addition, patients were asked to rate the number of hours per day and days per week that they experienced pain that interfered with their mood or activities.

The **KPS rating scale** measures patients' ability to accomplish normal activities of daily living and their need for caregivers' assistance (Karnofsky & Burchenal, 1949). The KPS scale used in this study consisted of eight items for ranking functional status. They ranged from 30 (i.e., disability requiring hospitalization) to 100 (i.e., adequate health status with no complaints and no evidence of disease). Reliability and validity of the KPS have been established (Karnofsky, 1977).

The **PES** contains 13 visual analog scales that measure an individual's knowledge about cancer pain and its management as well as an individual's perception of the pain experience (Ferrell, Rhiner, & Rivera, 1993). The knowledge portion of the PES contains nine items that address knowledge about addiction, physical dependence, frequency of drug administration, scheduling of drug administration, and side effects associated with opioid analgesics. Each item is rated using a 10-mm visual analog scale anchored on the left with the word "disagree" and on the right with the word "agree." Patients were asked to mark an "X" on the line to indicate their level of agreement with each item. Some items were reverse coded so that each item was scored to reflect the degree of correctness. A total PES knowledge score was determined by summing the scores for each of the individual items and then converting that score to a 100% scale. The reliability and validity of the PES are well established. Higher scores on each item indicate a more correct response (i.e., more agreement or more disagreement with the statement) (Ferrell, Rhiner, & Rivera).

Data Collection Procedures

Patients were approached by a recruitment nurse who explained the study procedures and obtained informed consent. Patients completed the demographic questionnaire and KPS rating at the time of enrollment and were randomized into the PRO-SELF[®] or standard care group. At weeks 1, 3, and 6, a research nurse assigned solely to the PRO-SELF[®] or standard care groups visited patients in their homes. The same nurse conducted telephone interviews at weeks 2, 4, and 5.

During the week 1 visit, both groups of patients completed the PES (Ferrell, Rhiner, & Rivera, 1993) to assess their knowledge about cancer pain and its management. The patients' responses to the PES questionnaire became the basis for the educational session with patients in the PRO-SELF[®] group. This session was tailored to meet individual learning needs. In addition, patients in the PRO-SELF[®] group were given written instructions regarding pain and side-effect management, taught how to use a weekly pillbox, and taught how to use a script to assist them in communicating with their physicians about unrelieved pain. During the subsequent home visits and follow-up phone calls, the educational content of the PRO-SELF[®] program was reinforced and patients were coached about how to modify their pain management plan to improve outcomes (see West et al. [2003] for a complete description of the PRO-SELF[®] program). The PES was readministered to both groups of patients at the final home visit to evaluate the effectiveness of the PRO-SELF[®] Pain Control Program.

Data Analysis

Descriptive statistics and frequency distributions were generated for the demographic and disease-related characteristics. Independent Student's *t* tests or chi-square analyses were performed to determine differences in demographic and disease-related characteristics among patients in the PRO-SELF[®] and standard care groups. To determine whether any differences existed over time in overall knowledge scores as well as for the individual items on the PES among patients in the PRO-SELF[®] and standard care groups, repeated measures analyses of variance with one between-subjects factor (i.e., group with two levels; PRO-SELF[®] versus standard care) and one within-subjects factor (i.e., time with two levels) were performed. The test of the interaction determined whether changes in PES total scores and scores for each of the individual items, from the beginning to the end of the study, were significantly different between the PRO-SELF[®] group and the standard care group. In addition, within each treatment group, the changes from the beginning to the end of the study for the total scores on the PES and each of the individual PES items were evaluated for significance using tests of the simple effects. All calculations used actual values. Adjustments were not made for missing data. Therefore, the cohort for each analysis was dependent on the largest complete set of data across groups. For all tests, a *p* value of less than 0.05 was considered statistically significant.

Results

Sample Demographics

The demographic and disease characteristics of patients in the PRO-SELF[®] (*n* = 93) and standard care groups (*n* = 81) are summarized in Tables 1 and 2. No significant differences were found in any of the demographic or disease characteristics among patients in the two groups.

Baseline Pain Characteristics

No significant differences were found in any of the baseline pain characteristics among patients in the PRO-SELF[®] and standard care groups (see Table 3). All of the participants experienced moderate to severe pain from bone metastasis that lasted almost half of the day.

Pain Experience Scale Scores

Pain knowledge was assessed prior to and at the completion of the intervention. For the total PES knowledge score, a significant group and time interaction (*p* < 0.0001) was found, indicating that the change in knowledge for the PRO-SELF[®] group was not the same as in the standard care group. As illustrated in Figure 1, the total PES knowledge score increased significantly in the PRO-SELF[®] group from 61 to 74 (i.e., a 21% increase) compared to the standard care group (i.e., from 62.0 to 62.3, a 0.5% increase). Changes in the individual items on the PES are summarized in Table 4. For the patients in the PRO-SELF[®] group, examination of the simple effects over time revealed that significant improvements in knowledge scores occurred for items 1 (cancer pain can be relieved), 2 (take pain medication only for severe pain), 5 (take the lowest amount of pain medicine possible), 6 (give pain medication around the clock), and 9 (patients are often given too much pain medicine). For patients in the standard care

Table 1. Demographic Characteristics of Patients in the PRO-SELF[®] and Standard Care Groups

Characteristic	PRO-SELF [®] (N = 93)		Standard Care (N = 81)	
	\bar{X}	SD	\bar{X}	SD
Age (years)	60.0	11.6	58.8	12.9
Education (years)	14.7	3.2	14.9	3.3
Karnofsky Performance Status score	69.1	11.4	71.5	12.3
Characteristic	n	%	n	%
Gender				
Male	29	31	22	27
Female	64	69	59	73
Lives alone	30	33	17	21
Marital status				
Married or partnered	46	50	48	60
Other	47	51	33	40
Ethnicity				
Caucasian	74	80	71	88
Other	19	20	10	12
Employment status				
Retired	32	35	35	43
Disability	31	34	19	24
Working full- or part-time	16	17	15	19
Other	14	14	12	15

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

group, examination of the simple effects over time revealed that significant decreases in knowledge scores occurred for items 4 (most patients with cancer will become physically dependent on pain medicine over time) and 8 (pain medicine often interferes with breathing) and that a significant increase in knowledge score occurred for item 6. Examination of the group and time interactions found that significant differences existed in the changes in knowledge scores over time between the PRO-SELF[®] group and the standard care group for items 2, 4, 5, 8, and 9.

Table 2. Disease and Treatment Characteristics of Patients in the PRO-SELF[®] and Standard Care Groups

Characteristic	PRO-SELF [®] (N = 93)		Standard Care (N = 81)	
	n	%	n	%
Cancer diagnosis				
Breast	49	53	41	51
Prostate	11	12	11	14
Lung	10	11	12	15
Other	23	25	17	20
Current cancer treatment				
Chemotherapy	45	48	35	44
Hormonal therapy	29	31	25	31
Radiation therapy	17	18	12	15
Biotherapy	1	1	1	1
No treatment	10	11	11	14

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

Table 3. Baseline Pain Characteristics of Patients in the PRO-SELF® and Standard Care Groups

Characteristic	PRO-SELF® (N = 93)		Standard Care (N = 81)	
	\bar{X}	SD	\bar{X}	SD
Pain right now	3.7	2.2	3.5	2.2
Average daily pain	4.1	1.7	4.2	1.8
Worst pain	6.7	2.1	6.7	2.4
Least pain	1.9	1.6	1.8	1.7
Hours per day that pain lasts	11.5	7.7	10.4	8.3
Number of days in significant pain	5.1	2.4	5.0	2.5

Note. Pain intensity scores can range from 0–10.

Discussion

Patients who received the PRO-SELF® Pain Control Program scored significantly higher on the PES at the end of the study than those who received standard care. In fact, the total PES score for the PRO-SELF® group increased by 21%. These findings are consistent with previous studies that used the PES to evaluate changes in knowledge (de Wit et al., 1997; Ferrell et al., 1994; Ferrell, Rhiner, & Rivera, 1993). However, de Wit et al. found only a 12% increase in knowledge in their intervention group. Although the differences in scores between de Wit et al. and the present study may not be clinically significant, the data suggest that a psychoeducational intervention that is reinforced over five weeks may improve knowledge better than an intervention of shorter duration. However, patients in the PRO-SELF® group had an average score of 73.7 on the knowledge portion of the PES at the end of the study. Even though these patients completed a psychoeducational program, their scores on the knowledge portion of the PES were not 100%.

The post-test scores for the PRO-SELF® group were significantly higher on five of the nine items compared to baseline. Significant improvement was observed for the following: cancer pain can be relieved (item 1), take pain medication

only for severe pain (item 2), take the lowest amount of pain medicine possible (item 5), give pain medication around the clock (item 6), and patients are often given too much pain medicine (item 9). These findings are consistent with those of de Wit et al. (1997) who also found a significant improvement in the items “take the lowest amount of pain medicine possible” and “give pain medicines around the clock” after the educational intervention. In contrast to de Wit et al. and Ferrell et al. (1994), no significant improvement was found in “fears about addiction.” Both groups of patients in the current study increased their knowledge about taking pain medications around the clock versus on as-needed basis. Although this approach was emphasized with the patients in the PRO-SELF® group, patients in the standard care group did receive a copy of the consumer version of the *Management of Cancer Pain: Clinical Practice Guidelines* published by the Agency for Health Care Policy and Research (Jacox et al., 1994). The importance of around-the-clock dosing is emphasized in this guideline. The improvement in scores in the standard care group may indicate that some of these patients read the booklet. The researchers were unable to determine why knowledge did not improve about the unlikely occurrence of addiction in patients with cancer as a result of the intervention as well as why the scores of patients in the standard care group decreased over time for the items related to physical dependence and respiratory depression. This finding warrants further investigation.

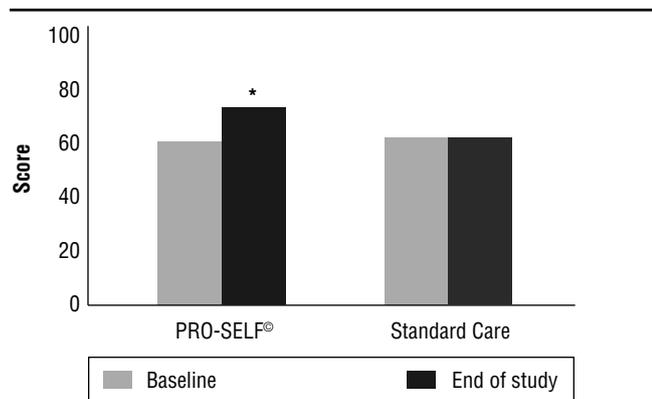
At baseline, the patients in the PRO-SELF® group had higher overall knowledge scores compared to previous reports (de Wit et al., 1997; Ferrell et al., 1994; Yeager et al., 1995). This difference may be attributed to the fact that these patients were better educated compared to those in other studies. In fact, a positive, although small, correlation ($r = 0.27, p = 0.001$) was found between PES knowledge scores and years of education for patients in the PRO-SELF® group.

This study and previous studies (de Wit et al., 1997; Ferrell et al., 1994; Yeager et al., 1995) found that patients scored lowest on the item “it is better to give the lowest amount of medicine early on so that larger doses can be used later if pain increases.” This finding suggests that patients received very little information about tolerance and the lack of a ceiling effect for opioid analgesics.

Patients achieved the highest score on the item related to nonpharmacologic interventions in this study and three other studies (de Wit et al., 1997; Ferrell et al., 1994; Yeager et al., 1995). What remains to be determined is which nonpharmacologic interventions patients use to manage cancer pain, as well as the effectiveness of these interventions. The authors currently are attempting to answer this question in another study.

Limitations

Two limitations of this study need to be acknowledged. The sample for this study was primarily Caucasian and well-educated, which limit the generalizability of the study findings. In addition, the cause of pain was limited to one etiology, namely bone metastasis. Therefore, these findings may not be applicable to patients with other types of cancer-related pain. The PRO-SELF® program, although designed for patients with an eighth-grade reading level, may need to be modified for patients with less educational preparation.



* $p < 0.0001$

Note. Values are plotted as means \pm standard deviations.

Figure 1. Differences Over Time in Pain Experience Scale Scores Among Patients in the PRO-SELF® (n = 93) and Standard Care (n = 81) Groups

Table 4. Pain Experience Scale Scores

Items on the Scale ^a	PRO-SELF [®] Group				Standard Care Group				
	N	Baseline X̄ (SD)	End-of-Study X̄ (SD)	Within-Group Difference Simple Effects p	N	Baseline X̄ (SD)	End-of-Study X̄ (SD)	Within-Group Difference Simple Effects p	Group x Time Interaction p
1. Cancer pain can be relieved.	92	7.94 (2.71)	8.93 (1.80)	0.002	76	7.79 (2.75)	7.89 (2.49)	0.780	0.052
2. Pain medicines should be given only when pain is severe. (disagree)	92	7.20 (3.56)	8.58 (2.79)	0.000	78	7.78 (3.23)	8.12 (2.47)	0.329	0.030
3. Addiction refers to a person's desire to use drugs for their effects on the mind or emotions rather than for the medical use of relieving pain. Most patients with cancer on pain medicines will become psychologically addicted to the medicines over time. (disagree)	89	6.08 (3.98)	6.86 (3.95)	0.078	75	6.51 (3.89)	6.99 (3.58)	0.311	0.653
4. Drug dependence means that a person would go through withdrawal if a pain medicine was stopped. Most patients with cancer on pain medicines will become physically dependent on the medicine over time.	90	5.37 (4.09)	6.11 (4.00)	0.138	74	5.05 (3.83)	3.90 (3.55)	0.037	0.011
5. It is better to give the lowest amount of pain medicines possible early on so that larger doses can be used later if pain increases. (disagree)	89	3.12 (3.67)	5.88 (4.04)	0.000	77	2.92 (3.45)	3.49 (4.18)	0.278	0.003
6. It is better to give pain medicines around the clock (on a schedule) rather than only when needed.	91	5.48 (3.94)	8.16 (2.94)	0.000	76	5.36 (4.03)	6.69 (3.65)	0.016	0.068
7. Treatments other than medicines (such as massage, heat, relaxation) can be helpful for relieving pain.	91	8.23 (2.67)	8.18 (2.71)	0.874	74	8.38 (2.68)	8.14 (2.70)	0.500	0.693
8. Pain medicines can often interfere with breathing. (disagree)	84	5.45 (3.70)	6.35 (3.61)	0.067	67	6.09 (3.91)	4.85 (3.50)	0.026	0.004
9. Patients are often given too much pain medicine. (disagree)	89	5.76 (3.88)	7.46 (3.30)	0.000	72	6.00 (3.77)	6.17 (3.53)	0.693	0.009
Total score	87	61.10 (12.50)	73.70 (16.20)	0.000	73	62.00 (15.00)	62.30 (11.30)	0.865	0.000

^a Individual item scores are based on visual analog scale ratings (0 indicates the least correct response and 10 indicates the most correct response). The correct response for items 1, 4, 6, and 7 is agree and for items 2, 3, 5, 8, and 9 is disagree.

Implications for Clinical Practice

The findings from this study demonstrate that the PES can be used as the basis for patient education in cancer pain management. Oncology nurses can use patients' responses to items on a survey such as the PES to individualize their teaching and spend more time on the identified knowledge deficits. This individualized approach to education about pain management may save staff time and improve patient outcomes. However, even with five weeks of education, patients did not achieve scores of 100% on the PES. In fact, additional research is warranted to

determine better methods to increase patients' knowledge about cancer pain management in more effective and efficient ways.

The authors would like to acknowledge the support and assistance of all of the physicians and nurses at the study sites as well as the project staff. They are especially grateful to all of the patients and family caregivers who participated in this study. In addition, they thank Craig Carlson and Fu Kato for technical assistance with the preparation of this manuscript.

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References

- Cleeland, C.S. (1987). Barriers to the management of cancer pain. *Oncology (Huntington)*, 1(2, Suppl.), 19–26.
- Cleeland, C.S., Cleeland, L.M., Dar, R., & Rinehardt, L.C. (1986). Factors influencing physician management of cancer pain. *Cancer*, 58, 796–800.
- Cleeland, C.S., Gonin, R., Hatfield, A.K., Edmonson, J.H., Blum, R.H., Stewart, J.A., et al. (1994). Pain and its treatment in outpatients with metastatic cancer. *New England Journal of Medicine*, 330, 592–596.
- Dalton, J.A. (1987). Education for pain management: A pilot study. *Patient Education and Counseling*, 9, 155–165.
- Dar, R., Beach, C.M., Barden, P.L., & Cleeland, C.S. (1992). Cancer pain in the marital system: A study of patients and their spouses. *Journal of Pain and Symptom Management*, 7, 87–93.
- de Wit, R., van Dam, F., Zandbelt, L., van Buuren, A., van der Heijden, K., Leenhouts, G., et al. (1997). A pain education program for chronic cancer pain patients: Follow-up results from a randomized controlled trial. *Pain*, 73, 55–69.
- Elliott, T.E., & Elliott, B.A. (1991). Physician acquisition of cancer pain management knowledge. *Journal of Pain and Symptom Management*, 6, 224–229.
- Elliott, T.E., & Elliott, B.A. (1992). Physician attitudes and beliefs about use of morphine for cancer pain. *Journal of Pain and Symptom Management*, 7, 141–148.
- Elliott, T.E., Murray, D.M., Elliott, B.A., Braun, B., Oken, M.M., Johnson, K.M., et al. (1995). Physician knowledge and attitudes about cancer pain management: A survey from the Minnesota cancer pain project. *Journal of Pain and Symptom Management*, 10, 494–504.
- Ferrell, B.R., Eberts, M., McCaffrey, M., & Grant, M. (1991). Clinical decision making and pain. *Cancer Nursing*, 15, 289–297.
- Ferrell, B.R., Ferrell, B.A., Ahn, C., & Tran, K. (1994). Pain management for elderly patients with cancer at home. *Cancer*, 74(7, Suppl.), 2139–2146.
- Ferrell, B.R., Rhiner, M., & Ferrell, B.A. (1993). Development and implementation of a pain education program. *Cancer*, 72(11, Suppl.), 3426–3432.
- Ferrell, B.R., Rhiner, M., & Rivera, L.M. (1993). Development and evaluation of the family pain questionnaire. *Journal of Psychosocial Oncology*, 10(4), 21–35.
- Ferrell, B.R., & Schneider, C. (1988). Experience and management of cancer pain at home. *Cancer Nursing*, 11, 84–90.
- Ferrell, B.R., Wisdom, C., & Wenzl, C. (1989). Quality of life as an outcome variable in the management of cancer pain. *Cancer*, 63(11, Suppl.), 2321–2327.
- Fife, B.L., Irick, N., & Painter, J.D. (1993). A comparative study of the attitudes of physicians and nurses toward the management of cancer pain. *Journal of Pain and Symptom Management*, 8, 132–139.
- Glover, J., Dibble, S.L., Dodd, M.J., & Miaskowski, C. (1995). Mood states of oncology outpatients: Does pain make a difference? *Journal of Pain and Symptom Management*, 10, 120–128.
- Ingham, J.M., & Foley, K.M. (1998). Pain and the barriers to its relief at the end of life: A lesson for improving end of life health care. *Hospice Journal*, 13, 89–100.
- Jacox, A., Carr, D., Payne, R., et al. (1994). *Management of cancer pain: Clinical practice guidelines no. 9* [AHCPR Publication No. 94-0592]. Rockville, MD: Agency for Health Care Policy and Research, U.S. Department of Health and Human Services, Public Health Service.
- Jones, W.L., Rimer, B.K., Levy, M.H., & Kinman, J.L. (1984). Cancer patients' knowledge, beliefs and behavior regarding pain control regimens: Implications for education programs. *Patient Education and Counseling*, 5, 159–164.
- Joranson, D.E. (1994). Are health-care reimbursement policies a barrier to acute and cancer pain management? *Journal of Pain and Symptom Management*, 9, 244–253.
- Karnofsky, D. (1977). Performance scales. In G.T. Kennealey & M.S. Mitchell (Eds.), *Factors that influence the therapeutic response in cancer* (pp. 191–205). New York: Plenum Press.
- Karnofsky, D., & Burchenal, J. (1949). The clinical evaluation of chemotherapeutic agents in cancer. In C.M. Macleod (Ed.), *Evaluation of chemotherapeutic agents* (pp. 199–205). New York: Columbia University Press.
- Lin, C.C., & Ward, S.E. (1995). Patient-related barriers to cancer pain management in Taiwan. *Cancer Nursing*, 18, 16–22.
- Miaskowski, C., Dodd, M., West, C., Schumacher, K., Paul, S.M., Tripathy, D., et al. (2004). A randomized clinical trial of the effectiveness of the PRO-SELF[®]: Pain Control Program in improving cancer pain management. *Journal of Clinical Oncology*, 22, 1713–1720.
- Miaskowski, C., Zimmer, E.F., Barrett, K.M., Dibble, S.L., & Wallhagen, M. (1997). Differences in patients' and family caregivers' perceptions of the pain experience influence patient and caregiver outcomes. *Pain*, 72, 217–226.
- Oliver, J.W., Kravitz, R.L., Kaplan, S.H., & Meyers, F.J. (2001). Individualized patient education and coaching to improve pain control among cancer outpatients. *Journal of Clinical Oncology*, 19, 2206–2212.
- Payne, R. (2000). Chronic pain: Challenges in the assessment and management of cancer pain. *Journal of Pain and Symptom Management*, 19(1, Suppl.), S12–S15.
- Riddell, A., & Fitch, M.I. (1997). Patients' knowledge of and attitudes toward the management of cancer pain. *Oncology Nursing Forum*, 24, 1775–1783.
- Rimer, B., Levy, M.H., Keintz, M.K., Fox, L., Engstrom, P.F., & MacElwee, N. (1987). Enhancing cancer pain control regimens through patient education. *Patient Education and Counseling*, 10, 267–277.
- Ward, S.E., Goldberg, N., Miller-McCauley, V., Mueller, C., Nolan, A., Pawlik-Plank, D., et al. (1993). Patient-related barriers to management of cancer pain. *Pain*, 52, 319–324.
- West, C.M., Dodd, M.J., Paul, S.M., Schumacher, K., Tripathy, D., Koo, P., et al. (2003). The PRO-SELF[®]: Pain Control Program—An effective approach for cancer pain management. *Oncology Nursing Forum*, 30, 65–73.
- Yeager, K.A., Miaskowski, C., Dibble, S.L., & Wallhagen, M. (1995). Differences in pain knowledge and perception of the pain experience between outpatients with cancer and their family caregivers. *Oncology Nursing Forum*, 22, 1235–1241. 

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- Cancer-Pain.org: Knowledge for Action
www.cancer-pain.org
- OncologyChannel.com: Pain
www.oncologychannel.com/pain
- World Health Organization: Cancer Pain Release
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Links can be found at www.ons.org.