

# A Randomized, Clinical Trial of Education or Motivational-Interviewing–Based Coaching Compared to Usual Care to Improve Cancer Pain Management

Mary Laudon Thomas, RN, MS, AOCN®, Janette E. Elliott, RN-BC, MS, AOCN®, Stephen M. Rao, PhD, Kathleen F. Fahey, RN, MS, CNS, Steven M. Paul, PhD, and Christine Miaskowski, RN, PhD, FAAN

**D**espite important advances in its management, cancer pain remains a significant clinical problem (Apolone et al., 2009; McGuire, 2004; van den Beuken-van Everdingen et al., 2007). In a meta-analysis, cancer pain was found in 64% of patients with metastatic disease, 59% of patients receiving antineoplastic therapy, and 33% of patients who had received curative cancer treatment (van den Beuken-van Everdingen et al., 2007). Cancer pain also has a negative effect on patients' functional status (Ferreira et al., 2008; Holen, Lydersen, Klepstad, Loge, & Kassa, 2008; Vallerand, Templin, Sasenau, & Riley-Doucet, 2007) and is associated with psychological distress (Cohen et al., 2003; Vallerand, Hasenau, Templin, & Collins-Bohler, 2005). The effect of cancer pain on an individual's quality of life (QOL) can be significant and extend beyond disturbances in mood and physical function (Burckhardt & Jones, 2005; Dahl, 2004; Fortner et al., 2003).

Although advances in pain management can reduce cancer pain for a significant number of patients, numerous clinician, healthcare system, and societal barriers (e.g., knowledge deficits, reimbursement and regulatory constraints, religious or cultural views) contribute to ineffective pain management (Brockopp et al., 1998; Dahl, 2004; Hill, 1993; Sun et al., 2007). Attitudinal barriers held by patients can be a substantive factor in the inadequate treatment of cancer pain (Anderson et al., 2002; Ward et al., 2008). Those attitudinal barriers need to be addressed if cancer pain management is to be improved (Fahey et al., 2008).

In a meta-analysis of the benefits of patient-based psychoeducational interventions for cancer pain management, Bennett, Bagnall, and Closs (2009) concluded

**Purpose/Objectives:** To test the effectiveness of two interventions compared to usual care in decreasing attitudinal barriers to cancer pain management, decreasing pain intensity, and improving functional status and quality of life (QOL).

**Design:** Randomized clinical trial.

**Setting:** Six outpatient oncology clinics (three Veterans Affairs [VA] facilities, one county hospital, and one community-based practice in California, and one VA clinic in New Jersey)

**Sample:** 318 adults with various types of cancer-related pain.

**Methods:** Patients were randomly assigned to one of three groups: control, standardized education, or coaching. Patients in the education and coaching groups viewed a video and received a pamphlet on managing cancer pain. In addition, patients in the coaching group participated in four telephone sessions with an advanced practice nurse interventionist using motivational interviewing techniques to decrease attitudinal barriers to cancer pain management. Questionnaires were completed at baseline and six weeks after the final telephone calls. Analysis of covariance was used to evaluate for differences in study outcomes among the three groups.

**Main Research Variables:** Pain intensity, pain relief, pain interference, attitudinal barriers, functional status, and QOL.

**Findings:** Attitudinal barrier scores did not change over time among groups. Patients randomized to the coaching group reported significant improvement in their ratings of pain-related interference with function, as well as general health, vitality, and mental health.

**Conclusions:** Although additional evaluation is needed, coaching may be a useful strategy to help patients decrease attitudinal barriers toward cancer pain management and to better manage their cancer pain.

**Implications for Nursing:** By using motivational interviewing techniques, advanced practice oncology nurses can help patients develop an appropriate plan of care to decrease pain and other symptoms.

that, compared to usual care, educational interventions improved knowledge and attitudes and reduced average and worst pain intensity scores. However, those interventions had no effect on medication adherence or in reducing pain's level of interference with daily activities. Bennett et al. (2009) suggested that additional trials are warranted to test different approaches to cancer pain education and to clarify the exact relationships between education and improved patient outcomes.

Many psychoeducational intervention studies were conducted in the hospital setting (Chang, Chang, Chiou, Tsou, & Lin, 2002; de Wit et al., 2001; Jahn et al., 2010) or in patients' homes (Given et al., 2002; Miaskowski et al., 2004), which limited the generalizability of the findings to the outpatient clinic setting. In addition, although they achieved a positive outcome, many of the studies were labor-intensive, which also limited their ability to be implemented in a busy oncology clinic (Given et al., 2002; Miaskowski et al., 2004). Unfortunately, studies using less labor-intensive interventions were not as successful in decreasing cancer pain (Anderson et al., 2002; Oliver, Kravitz, Kaplan, & Meyers, 2001; Syrjala et al., 2008).

Coaching is a useful strategy to improve cancer pain management (Kalauokalani, Franks, Oliver, Meyers, & Kravitz, 2007; Miaskowski et al., 2004). Incorporating principles of motivational interviewing into a coaching intervention affords a unique method of exploring personal attitudes, behaviors, and beliefs that can interfere with effective cancer pain management (Fahey et al., 2008; Prochaska & DiClemente, 1984).

Change theory, specifically the Transtheoretical Model (Prochaska & DiClemente, 1984), is a useful conceptual framework for coaching. In this model, behavioral change is a function of a person's state of readiness or motivation to modify a particular behavior. Motivational interviewing is a nonauthoritarian counseling technique that can assist patients in recognizing and resolving ambivalence about making constructive behavioral changes. It matches the patients' readiness to change and can motivate the patient to move through the stages of the Transtheoretical Model: precontemplation (unaware of need for change), contemplation (thinking about change), preparation (actively considering change), action (engaging in changing behavior), and maintenance (maintaining a changed behavior) (Fahey et al., 2008; Prochaska & DiClemente, 1984).

Given the limitations of previous intervention studies, additional research is warranted using approaches that can be implemented in the outpatient setting. Therefore, the purposes of this randomized clinical trial were to test the effectiveness of two interventions compared to usual care in decreasing attitudinal barriers to cancer pain management, decreasing pain intensity, and improving pain relief, functional status, and QOL. The authors hypothesized that the motivational-interviewing-based

coaching group would demonstrate greater benefit (i.e., decreasing attitudinal barriers; decreasing pain intensity; and improving pain relief, functional status, and QOL) than either the conventional education or usual care groups.

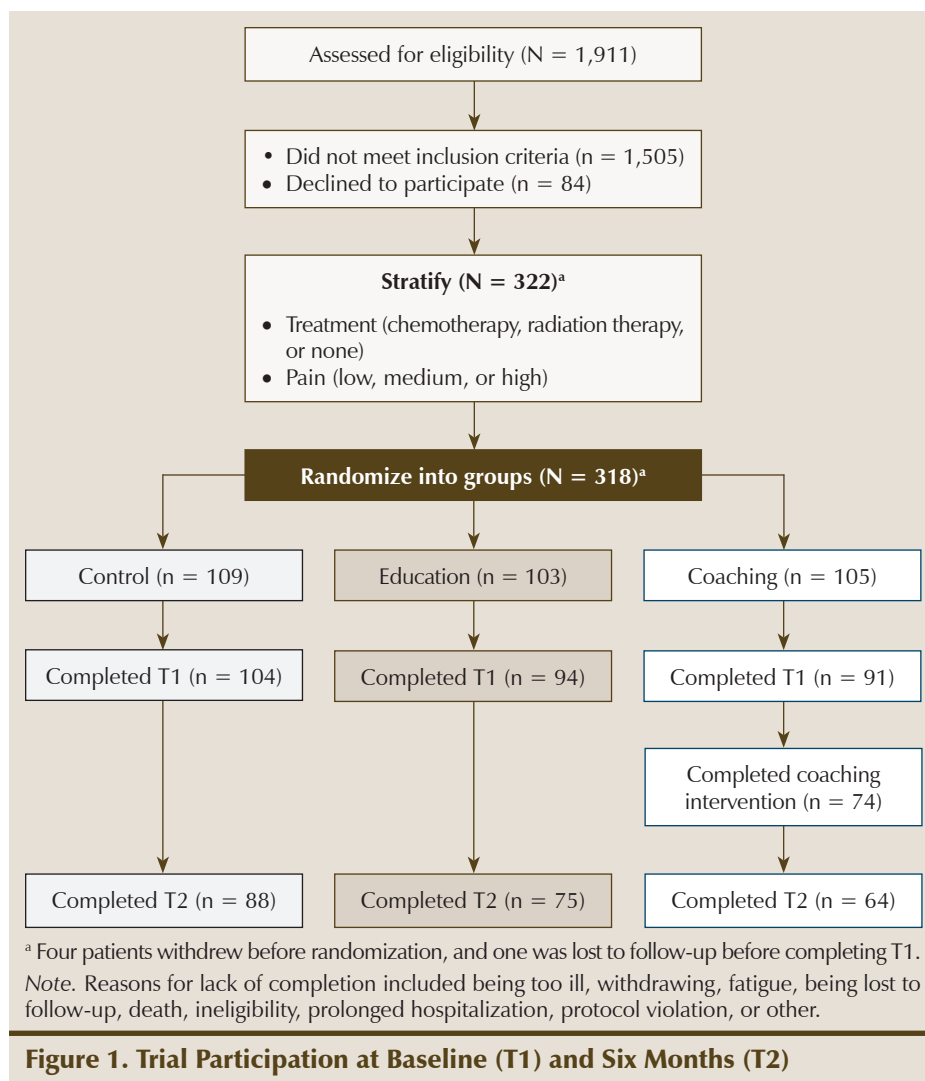
## Methods

### Sample and Settings

A convenience sample was obtained by recruiting patients from six outpatient oncology clinics (three Veterans Affairs [VA] facilities, one county hospital, and one community-based practice in California, and one VA clinic in New Jersey). Patients were eligible to participate if they were able to read and understand the English language, had access to a telephone, had a life expectancy longer than six months, and had an average pain intensity score of 2 or higher as measured on a 0–10 scale, with higher scores indicating more pain. Patients were excluded if they had a concurrent cognitive or psychiatric condition or substance abuse problem that would prevent adherence to the protocol, had severe pain unrelated to their cancer, or resided in a setting where the patient could not self-administer pain medication (e.g., nursing home, board and care facility). The study was approved by the institutional review board and research committee at each of the sites. To test the interaction of time (change in scores from pre- to post-study) by assignment to the three treatment groups (i.e., control, education, or coaching), a sample size of 240 was needed to detect a medium effect ( $f = 0.25$ ;  $\eta^2 = 6\%$  of explained variance). As shown in Figure 1, of the 1,911 patients who were screened, 406 were eligible to participate, 322 provided written informed consent, and 289 completed baseline assessments after being randomized to one of three groups.

### Procedures

Prior to beginning participant recruitment, all research team members were trained extensively so that the procedures for enrollment, data collection, and interventions were standardized across all clinic sites. Research associates (RNs or psychology interns) were trained in procedures for evaluating potential participants, approaching them, obtaining consent to participate, and administering the instruments and videotapes. Importantly, the research associates were trained in providing attention-control telephone calls. The nurse interventionist was trained extensively in motivational interviewing and change theory by a cognitive behavioral psychologist and then in procedures related to the specific coaching protocol. Details of this training are described in Fahey et al. (2008). Monthly team meetings were held throughout the study to ensure procedural fidelity was maintained.



**Figure 1. Trial Participation at Baseline (T1) and Six Months (T2)**

Patients were identified by clinic staff and screened for eligibility by the research associate, who then approached eligible patients, explained the study, and obtained written informed consent. Patients were stratified based on pain intensity (i.e., low, medium, or high) and cancer treatment (i.e., chemotherapy or radiation therapy) to control for the confounding variables of pain intensity and the effects of cancer treatment. Stratifying by pain intensity accounts for the curvilinear relationship between pain severity and functional status (e.g., changes in pain intensity at the upper levels of the scale have a different effect on functional status compared to changes at the lower levels of the scale). Stratification by cancer therapy was used to control for the effect of treatment in either decreasing pain from shrinking the tumor or increasing pain because of toxicity of treatment. Patients at each clinic site then were randomized based on the stratification criteria using permuted blocks with variable sizes into one of three groups: usual care (control), education, or coaching. This method of randomization was used to ensure balance across the treatment groups within each stratification cell.

Patients and clinicians at the study sites were blinded to the patient's group assignment. At the time of enrollment, patients completed a demographic questionnaire, the Karnofsky Performance Status (KPS) scale (Karnofsky & Burchenal, 1949), the Brief Pain Inventory (Daut, Cleeland, & Flanery, 1983), the Barriers Questionnaire (BQ) (Ward et al., 1993), the 36-Item Short Form Health Survey (SF-36<sup>®</sup>) (Ware & Sherbourne, 1992), and the Functional Assessment of Cancer Therapy-General (FACT-G) (Cella et al., 1993). The patients' medical records were reviewed for disease and treatment information.

Patients in the usual care group viewed a video on cancer (American Cancer Society, 1994). Patients assigned to the education group viewed a video on managing cancer pain that focused on overcoming attitudinal barriers (Syrjala, Abrams, Du Pen, Niles, & Rupert, 1995) and received the Agency for Health Care Policy and Research (1994) pamphlet entitled, *Managing Cancer Pain, Consumer Version, Clinical Practice Guideline Number 9*. To simulate

the time constraints in many oncology outpatient clinics, no reinforcement of the material was provided unless the patient sought additional information or asked questions of the clinic staff. Patients assigned to the coaching group received the same intervention as those assigned to the education group. In addition, they participated in four 30-minute telephone sessions that explored beliefs about pain, use of analgesics and nonpharmacologic pain management strategies, and communication about pain management. Those four calls were conducted about every other week over a six-week time period by the nurse interventionist, a clinical nurse specialist trained in motivational interviewing techniques. For a detailed description of the coaching intervention, see Fahey et al. (2008). Patients assigned to the usual care and education groups also received four telephone calls (about every other week over a six-week time period) from the research assistance for attention-control purposes. Six weeks after the final telephone call (i.e., 12 weeks postrandomization), all patients completed the same questionnaires that were done at enrollment. Participants

received a \$25 gift certificate after completing each set of questionnaires.

## Instruments

Attitudinal barriers were assessed with the **BQ** (Ward et al., 1993; Ward & Gatwood, 1994), a 27-item instrument that measures eight barriers to cancer pain management (concern about side effects, concern about tolerance, fear of addiction, fatalism, fear of disease progression, desire to be a good patient, fear of injections, and concern about distracting the physician from curing disease). Each item is rated on a scale from 0 (not at all agree) to 5 (agree very much). Mean subscale and total scores were calculated for the BQ, with higher scores reflecting stronger barriers.

The BQ has demonstrated adequate validity and reliability (Ward et al., 1993; Ward & Gatwood, 1994).

Pain was assessed with the **Brief Pain Inventory**, a self-report instrument designed to assess the intensity and quality of pain, the extent to which pain relief was obtained, and the extent to which pain interferes with function (Daut et al., 1983). Severity and interference are rated on a numeric score from 0 (does not interfere) to 10 (completely interferes). A mean interference score was calculated (Serlin, Mendoza, Nakamura, & Cleeland, 1995), with higher scores reflecting greater pain intensity and greater interference with function.

Functional status was measured with the **SF-36** (Ware & Sherbourne, 1992). Eight health concepts

**Table 1. Demographic and Clinical Characteristics by Study Group**

Characteristic	Control (N = 88) <sup>a</sup>		Education (N = 75) <sup>b</sup>		Coaching (N = 64)		Statistics
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
Age (years)	58.7	11.5	62.5	11.2	61.8	11.3	F(2, 223) = 2.54, p = 0.08
Education (years)	13.8	2.7	12.8	2.6	13.1	3.2	F(2, 222) = 2.57, p = 0.08
Time since diagnosis (months)	31.9	52.7	37.5	45	30	42.5	F(2, 222) = 0.48, p = 0.62
Karnofsky Performance Status score <sup>c</sup>	76.6	12.5	72.3	12.7	77.6	13.2	F(2, 222) = 3.53, p = 0.03*
Characteristic	n	%	n	%	n	%	Statistics
<b>Gender</b>							$\chi^2 = 4$ ; p = 0.13
Male	79	90	71	95	54	84	
Female	9	10	4	5	10	16	
<b>Ethnicity</b>							$\chi^2 = 13.4$ , p = 0.65
African American	21	24	15	20	7	11	
Caucasian	48	56	44	60	44	69	
Latino	6	7	8	11	7	11	
Other	11	13	7	10	6	9	
<b>Marital status</b>							$\chi^2 = 8.3$ , p = 0.61
Married or partnered	40	46	37	50	33	52	
Widowed, divorced, or separated	33	38	23	31	27	42	
Never married	15	17	14	19	4	6	
<b>Living arrangements</b>							$\chi^2 = 6.4$ , p = 0.38
Alone	23	26	12	16	15	23	
With family or friends	55	63	57	76	47	73	
Other	10	11	6	8	2	3	
<b>Employment</b>							$\chi^2 = 10.1$ , p = 0.61
Full- or part-time	10	12	4	5	5	8	
Disability, leave of absence, or retired	54	63	57	77	48	75	
Unemployed	18	21	11	15	10	16	
Other	4	5	2	3	1	2	
<b>Cancer diagnosis</b>							$\chi^2 = 45.7$ , p = 0.72
Breast	5	6	3	4	8	13	
Colon	6	7	2	3	4	6	
Head and neck	12	14	7	9	6	9	
Lung	21	24	14	19	9	14	
Myeloma	6	7	5	7	6	9	
Prostate	12	14	16	21	11	17	
Other (mixed types)	26	30	28	37	20	31	

\* Education < coaching, p < 0.05

<sup>a</sup> Because patients could refuse to complete items, N = 86 for ethnicity and employment.

<sup>b</sup> Because patients could refuse to complete items, N = 74 for ethnicity, marital status, and employment.

<sup>c</sup> Scores indicate functional status on a 0–100 scale, with higher scores reflecting higher function.

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



were assessed (physical functioning, role limitations because of physical health problems, bodily pain, social functioning, role limitations because of emotional health problems, general mental health, vitality, and perception of general health). In addition, physical and mental component summary scores are obtained by combining scores related to physical and mental functioning, respectively. For each scale, scores are reversed (as needed so that higher scores reflect better health states), summed, and linearly transformed on a 0–100 scale, with higher scores reflecting higher functioning. The SF-36 has been used extensively and has well-established validity and reliability (Given, Given, Az-zouz, Stommel, & Kozachick, 2000; McHorney, Ware, & Raczek, 1993; Miaskowski et al., 2007; Thong, Mols, Coebergh, Roukema, & van de Poll-Franse, 2009).

QOL was measured with the FACT-G (Cella et al., 1993). Four QOL domains (physical, social, emotional, and functional well-being) are measured. Patients were asked to rate the extent to which they agreed with each item using a five-point Likert-type scale that ranged from 0 (not at all) to 4 (very much). Scores for items within each subscale are summed to obtain a subscale score, and all of the individual items are summed to obtain a total score, which can range from 0–112. The FACT-G has been used in numerous studies of patients with cancer (Elting et al., 2008; Wittmann, Vollmer, Schweiger, & Hiddemann, 2006; Zimmerman et al., 2010) and specifically in studies of patients with cancer-related pain (Chang, Hwang, & Kasimis, 2002; Harris et al., 2009). The FACT-G has well-established validity and reliability (Cella et al., 1993).

## Data Analysis

Differences in demographic and clinical characteristics among the three groups were evaluated using analyses of variance and chi-square tests. Analyses of covariance were performed to evaluate for differences in scores on average and worst pain intensity, pain relief, mean pain interference, the BQ, the SF-36, and the FACT-G among the three patient groups. That procedure allows for the evaluation of the end-of-study outcomes while controlling for those same outcomes at baseline. The examination of differences among groups in end-of-study outcomes, with baseline measurements of those outcomes covaried out, often is a preferred method for examining changes in outcome measures from the beginning to the end of a study (Cohen, 1988). All calculations used actual values. Adjustments were not made for missing data; therefore, the cohort for each analysis was dependent on the largest set of data across groups. If the overall analysis of covariance for a particular outcome indicated differences among the three groups, pairwise contrasts were conducted to determine the location of the difference. The Bonferroni procedure was used to distribute a family alpha

of 0.05 across the three pairwise contrasts. All p values have been adjusted so that values lower than 0.05 are considered statistically significant.

## Results

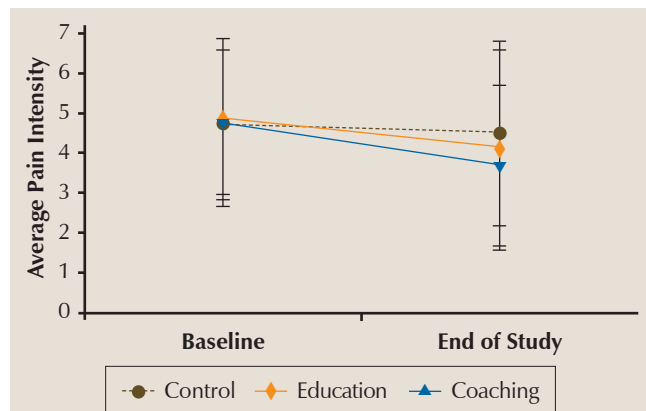
### Sample

Of the 289 patients who enrolled, 227 completed the end-of-study evaluation. The length of time from cancer diagnosis to study enrollment averaged 30–38 months. The most common cancer types were lung, prostate, and head and neck. Most patients were men and middle-aged, and about half of the sample was married or partnered. No differences were found among the three groups on any demographic or clinical characteristic except KPS score. Patients in the education group reported significantly lower KPS scores than patients in the coaching group ( $p = 0.03$ ) (see Table 1).

### Instrument Scores

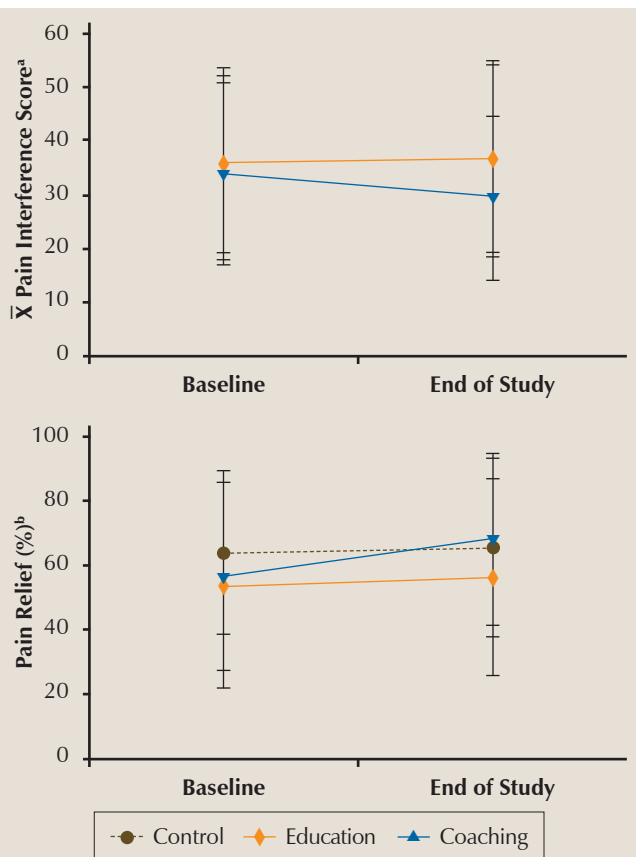
**Barrier Questionnaire:** Barrier subscale scores were modest in all three groups, with concerns about addiction and disease progression rated higher than those related to fatalism or the need to be a “good patient” (data not shown). However, after controlling for each of the BQ scores at baseline, no differences were found among the three groups in any of the subscale or total BQ scores.

**Pain intensity, interference, and relief:** After controlling for average pain at baseline, no differences were found among the three groups in average pain intensity scores at the end of the study ( $p = 0.08$ ) (see Figure 2). Similarly, nonsignificant scores were found among the three groups in worst pain intensity scores (data not shown). However, significant differences were found among the three groups in mean pain interference scores at the end of the study ( $p = 0.01$ ) (see Figure 3). Post-hoc



Note.  $F = 2.58$ ;  $p = 0.08$

**Figure 2. Changes Over Time in Average Pain Intensity Scores by Patient Group**



<sup>a</sup>  $F = 4.53, p = 0.01$ ; coaching > control,  $p = 0.02$ ; coaching > education,  $p = 0.03$

<sup>b</sup>  $F = 2.63, p = 0.07$

Note. All values are plotted as means and standard deviations of the mean.

**Figure 3. Changes Over Time in Mean Pain Interference and Pain Relief Scores by Group**

contrasts demonstrated that the coaching group had lower mean pain interference scores at the end of the study compared to the education and control groups ( $p = 0.03$  and  $0.02$ , respectively). After controlling for baseline pain relief scores, no significant differences were found among the three groups in the percentage of pain relief ( $p = 0.07$ ) at the end of the study.

**Short-Form Health Survey:** Table 2 lists the pre- and post-study SF-36 subscale and component scores for the three groups. After controlling for each of the baseline SF-36 subscale and component scores, no significant differences were found among the groups in social functioning, physical or emotional role functioning, bodily pain, or physical component scores. However, after controlling for each of the subscale scores at baseline, significant differences were found among the groups in general health, vitality, mental health, and the mental component summary score. Post-hoc contrasts demonstrated that the coaching group had higher mental health component scores compared to the control group. All other post-hoc comparisons were not significant.

### Functional Assessment of Cancer Therapy—General:

Table 3 lists the pre- and post-study subscale and total QOL scores for the three groups. Scores for all four subscales remained stable over time. After controlling for each of the FACT-G scores at baseline, no significant differences were found among the groups on any of the subscale or total scores.

## Discussion

Educational interventions have demonstrated positive outcomes in decreasing cancer pain (Clotfelter, 1999; Dalton, Keefe, Carlson, & Youngblood, 2004; de Wit et al., 2001; Syrjala et al., 2008; Ward et al., 2008; Yates et al., 2004). Coaching has been tested less frequently as a pain management intervention, but it resulted in positive outcomes in three studies (Kalauokalani et al., 2007; Miaskowski et al., 2004; Oliver et al., 2001). Although successful, the labor-intensive nature of those interventions may limit their use in clinical practice.

The current study tested the effects of two interventions (standardized education and coaching) that were feasible for implementation in an outpatient oncology clinic setting. The coaching intervention was designed to afford flexibility for both the patient and the nurse interventionist to enhance its utility in clinical practice. Patients assigned to the coaching group reported a statistically significant decrease in pain's interference with function and improved ratings of vitality, mental health, and general health. Compared to standardized education, coaching also was associated with clinical improvements in cancer pain management (i.e., decreased cancer pain intensity and improvement or stability in functional status and quality of life). However, most of the improvements were not statistically significant. Several possible explanations exist for the lack of statistical significance for most of the outcome measures.

The current study was unique in that the coaching intervention used principles of motivational interviewing and was based on the Transtheoretical Model of change theory. Those basic principles involve addressing issues of greatest importance from the patient's perspective and assessing the individual's readiness to change a particular behavior. Some patients in the coaching group exhibited persistent reluctance to consider changing a given attitude or behavior that might result in improving their cancer pain management. More commonly, the issue of priorities had a significant effect on the nurse interventionist's ability to address attitudinal barriers that might affect cancer pain management. Cancer pain does not exist in a vacuum. Other issues, related—or not—to cancer and its treatment, often were more pressing from the patient's perspective. True to the theoretical underpinnings of the intervention, the nurse interventionist, in turn, focused on those more pressing issues. That adaptation posed challenges in adhering to the attitudinal content within the

**Table 2. Short-Form Health Survey Scores by Study Group**

Subscale	Control (N = 88)		Education (N = 75)		Coaching (N = 64)		Statistics
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
<b>Physical functioning</b>							F = 1.179, p = 0.309
Prestudy	42.4	25.4	40.3	27.4	43.5	27.9	
Post-study	37.3	23.7	35	25.3	42.2	29.2	
<b>Body pain</b>							F = 2.817, p = 0.062
Prestudy	36.9	19	32.5	16.2	33.9	20.6	
Post-study	37.4	21.3	38.4	23.4	43.2	21.8	
<b>General health</b>							F = 4.249, p = 0.015 <sup>a</sup>
Prestudy	41.7	21.5	41.4	19.3	47.8	23.6	
Post-study	40.4	22.9	35.3	18.2	47.4	24.3	
<b>Vitality</b>							F = 3.963, p = 0.02 <sup>b</sup>
Prestudy	34.7	18.9	35.5	20.8	37.1	21.2	
Post-study	32	19.7	30	19.5	39.3	22.7	
<b>Mental health</b>							F = 3.207, p = 0.042 <sup>c</sup>
Prestudy	64	20.6	62.3	21.2	66.3	19.4	
Post-study	63.6	19.3	62	22	70.8	20.4	
<b>Mental component</b>							F = 3.397, p = 0.035 <sup>d</sup>
Prestudy	42.5	11.9	41.6	12.6	43.3	11.8	
Post-study	41	12.1	41.1	12.5	45.7	12.1	

<sup>a</sup> Coaching > education, p = 0.016

<sup>b</sup> Coaching > education, p = 0.02

<sup>c</sup> Coaching > control, p = 0.089; coaching > education, p = 0.07

<sup>d</sup> Coaching > control, p = 0.043

study design was modified at the request of the peer reviewers to delay the post-test to six weeks after the coaching intervention was completed. In hindsight, another measurement should have been made immediately after the coaching intervention was completed (six weeks after baseline), with a third measurement at 12 weeks after baseline. The additional measurement would have allowed for an assessment of the immediate effects of the intervention, particularly with patients who were able to complete the intervention, but died or were too ill to complete the questionnaires at 12 weeks. If a more significant effect was seen immediately after completing the intervention, but was not sustained, an argument could then be made for providing some brief ongoing sessions to reinforce the coaching intervention.

coaching protocol, but addressed the unique needs presented by the patient. Although the variation was viewed very positively by patients in their study exit interview, its effect on decreasing cancer pain likely was reduced.

Similarly, the researchers had difficulty maintaining the attention-control telephone calls for their intended purpose (i.e., to control for the attention received by those in the coaching group). A substantial number of patients (assigned to either the education or control groups) voiced significant problems or concerns to the research associate during those calls, which required the research associate to notify the patients' clinicians. Although such notification was important from a clinical and ethical standpoint, the patients did not seek intervention on their own, but rather waited for support and assistance from the research associate beyond that offered from the attention control design, which may have blunted the effects of the coaching intervention.

Another possible explanation for the current findings is that the coaching intervention yielded a positive benefit, but the benefit was not sustainable. The

In isolation, a behavioral intervention to decrease cancer pain likely will demonstrate a small effect size. Therefore, the lack of statistical significance may simply be a reflection of inadequate sample size. The sample size also was affected by a high attrition rate (30% of those who enrolled to participate), often because of death or disease progression, which could have contributed to the lack of statistical significance in many of the outcome

**Table 3. Functional Assessment of Cancer Therapy–General Scores by Study Group**

Subscale	Control (N = 88)		Education (N = 75)		Coaching (N = 64)		Statistics
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	
<b>Physical well-being</b>							F = 1.373, p = 0.26
Prestudy	15.5	6.1	15.2	5.8	16.9	5.5	
Post-study	15.7	5.7	15.5	6.1	17.6	6.2	
<b>Social well-being</b>							F = 0.465, p = 0.63
Prestudy	19	6.3	20.2	6.1	21.1	5.4	
Post-study	19	6.4	19.3	6.3	20.5	6.1	
<b>Emotional well-being</b>							F = 2.41, p = 0.09
Prestudy	16.7	5.3	16.7	4.7	16.5	5.6	
Post-study	16.8	4.9	16.2	5.3	17.6	5.3	
<b>Functional well-being</b>							F = 1.382, p = 0.25
Prestudy	12.4	5.3	12.9	5.7	14.1	6.1	
Post-study	12.8	5.7	12.3	5.8	14.4	6.4	
<b>Total score</b>							F = 2.164, p = 0.12
Prestudy	63.6	15.6	65.1	16.9	68.8	15.9	
Post-study	64.4	16.3	63.3	17.5	70.5	17.3	

measures. In addition, more patients assigned to the coaching group were unable to complete the end-of-study measures.

Another possible explanation for the lack of statistical significance on many of the outcome measures is that the instruments used were not sensitive enough to detect change. As a group, the sample scored low on each barrier subscale and total score; the scores were similar to those reported in other studies (Ward et al., 2008). Although participants in the coaching group achieved an improvement in each subscale (except fear of injections) that was greater than the improvement in the other two groups, the differences were not significant. Given the low baseline scores and smaller number of patients assigned to the coaching group, the ability to improve those scores would be extremely difficult. More importantly, during the coaching telephone calls, unique barriers were identified by the patients and discussed that were not always reflected in the scores on the BQ (Fahey et al., 2008). The strength of such beliefs or barriers may be so great that four coaching calls may have been inadequate to overcome that enduring attitude. In addition, motivational interviewing is based on change theory, in which an individual's readiness to change behavior is crucial to the success of a behavioral intervention (Prochaska & DiClemente, 1984). The current study did not assess, nor stratify for, an individual's readiness to change a priori, which also could be a contributing factor to those findings.

At baseline, the FACT-G subscale and total scores in the current study were markedly lower than in the general population, particularly the physical and functional well-being subscale scores (Holzner et al., 2004). Similarly, functional well-being scores were lower than those previously reported by patients with cancer (Burckhardt & Jones, 2005; Sherman, Simonton, Latif, Plante, & Anaissie, 2009). However, baseline scores for all FACT-G subscales were similar to those obtained in another study of U.S. Veterans with cancer pain (Chang et al., 2002). QOL scores did not change substantially over time in any group, which suggests that cancer pain was not a significant factor in the QOL of those patients. An alternative explanation is that the stability of scores may reflect the inability of the FACT-G to detect subtle changes in QOL. Niv and Kreitler (2001) acknowledge that pain can be an important factor in one's QOL, but also suggested that it may not always be the most important. Therefore, focusing solely on managing pain may not necessarily have a significant effect on QOL. This view was substantiated in the coaching group, in which other issues that affected the patient's QOL often took precedence over cancer pain (e.g., those related to cancer treatment, family, or economic hardship).

The SF-36 scores reported by patients in the current study were lower than those reported by the general

U.S. population (Miaskowski et al., 2007; Wensing, Vingelhoets, & Grol, 2001) and other samples of patients with cancer (Boini, Briançon, Guillemin, Galan, & Hercberg, 2004; Miaskowski et al., 2007; Mols, Coebergh, & van de Poll-Franse, 2007; Wensing et al., 2001). Perhaps reflective of the supportive and alliance-building nature of the intervention, scores related to mental health, mental component summary score, and even vitality and social function improved from baseline in the coaching group. In contrast, those scores declined in the other two groups. As expected, physical functioning and general health declined over time in the control and education groups, yet surprisingly remained stable in the coaching group. Although bodily pain scores improved in the coaching group ( $p = 0.06$ ), attempts to improve cancer pain management are unlikely to fully explain all of those differences. However, the improvement may better reflect the nurse interventionist's willingness to adapt to more pressing issues facing the patient during the coaching telephone calls. That action is consistent with motivational interviewing, but not captured by standardized instruments.

Finally, the current study was not designed to alter the amount and types of analgesics prescribed. The types and amount of opioids prescribed and taken varied widely among referral sites (Thomas, Annis, & Hwang, 2004). Interestingly, in this subanalysis, the amount of opioids prescribed or taken did not appear to affect pain intensity ratings, pain relief, or satisfaction with pain management. Although interventions that focus on medication use alone also have not been consistently effective in controlling cancer pain, integrating pharmacologic interventions with cognitive-behavioral interventions might produce results that are more significant.

This study highlights the challenges of testing interventions that focus on clinical processes regarding provider advice, communication, and education in a severely ill patient population. Those clinical processes often are complex, and several interacting components may account for the outcomes. As a result, the authors encourage the use of design methodologies and outcome measures that address the complexities of clinical translational studies and use of nonpharmacologic interventions. Future studies should compare a coaching intervention with different types of controls to ensure that the specific effect of the intervention can be better distinguished from those of other controlled factors, such as time, attention, motivation, expectations, and experience (Bennett, 2010; Bennett et al., 2009).

## Conclusions and Implications for Nursing Practice

Findings from the current study did not support the use of mass-produced educational materials as an



effective means of managing cancer pain. However, in the busy clinic setting, too often this approach is all a patient with cancer in pain may receive. Symptoms including cancer pain may not be carefully assessed, nor interventions carefully selected, implemented, and discussed. Advanced practice nurses (APNs) provide comprehensive assessments of symptoms and problems faced by patients with cancer. Using motivational interviewing, APNs and patients can jointly develop an appropriate plan of care to decrease those symptoms. Motivational interviewing is a skill that can be mastered by an APN with sufficient training. In working with patients over time, the use of motivational interviewing can yield positive outcomes that extend beyond traditional cancer pain management. Indeed, the use of motivational interviewing is becoming more popular as a mechanism to increase patient adherence with medical treatment. Cancer pain management needs to be addressed from an integrated biopsychosocial approach (e.g., pharmacologic, cognitive, behavioral, motivational, educational) for its effectiveness to be achieved fully.

The authors gratefully acknowledge Marilyn (Marty) Douglas, DNSc, RN, FAAN, who was coprincipal investigator of this study. They also gratefully acknowledge the time and commitment on the part of the patients who participated in this study.

Mary Laudon Thomas, RN, MS, AOCN<sup>®</sup>, is a hematology clinical nurse specialist and Janette E. Elliott, RN-BC, MS, AOCN<sup>®</sup>, is a pain management clinical nurse specialist, both at the Veterans Administration Palo Alto Healthcare System in California; Stephen M. Rao, PhD, is the health behavior coordinator and director of the Training Psychology Postdoctoral Fellowship Program at the San Francisco Veterans Administration Healthcare System in California; Kathleen F. Fahey, RN, MS, CNS, is the palliative care coordinator at El Camino Hospital in Mountain View, CA; and Steven M. Paul, PhD, is the principal statistician and Christine Miaskowski, RN, PhD, FAAN, is a professor and associate dean for Academic Affairs, both in the Department of Nursing at the University of California, San Francisco. This research was supported by the Department of Veterans Affairs, Veterans Health Administration, Health Services Research and Development Service (Project Number NRI-97026). The views expressed in this article are those of the authors and do not necessarily represent the views of the Department of Veterans Affairs. Thomas can be reached at mary.thomas4@va.gov, with copy to editor at ONFEditor@ons.org. (Submitted July 2010. Accepted for publication May 17, 2011.)

Digital Object Identifier: 10.1188/12.ONF.39-49

## References

- Agency for Health Care Policy and Research. (1994). *Managing cancer pain, consumer version, clinical practice guideline number 9*. Rockville, MD: U.S. Department of Health and Human Services.
- American Cancer Society. (1994). *The cancer experience: Living with treatment* [Videotape]. Atlanta, GA: American Cancer Society.
- Anderson, K.O., Richman, S.P., Hurley, J., Palos, G., Valero, V., Mendoza, T.R., . . . Cleeland, C.S. (2002). Cancer pain management among underserved minority outpatients: Perceived needs and barriers to optimal control. *Cancer, 94*, 2295–2304. doi:10.1002/cncr.10414
- Apolone, G., Corli, O., Caraceni, A., Negri, E., Deandrea, S., Montanari, M., . . . Cancer Pain Outcome Research Study Group Investigators. (2009). Pattern and quality of care of cancer pain management. Results from the Cancer Pain Outcome Research Study Group. *British Journal of Cancer, 100*, 1566–1574. doi:10.1038/sj.bjc.6605053
- Bennett, M.I. (2010). Methodological issues in cancer pain: Non-pharmacological trials. In J.A. Paice, R.F. Bell, E.A. Kalso, & O.A. Soyannwo (Eds.), *Cancer pain: From molecules to suffering* (pp. 207–218). Seattle, WA: IASP Press.
- Bennett, M.I., Bagnall, A., & Closs, S.J. (2009). How effective are patient-based educational interventions in the management of cancer pain? Systematic review and meta-analysis. *Pain, 143*, 192–199. doi:10.1016/j.pain.2009.01.016
- Boini, S., Briançon, S., Guillemin, F., Galan, P., & Hercberg, S. (2004). Impact of cancer occurrence on health-related quality of life: A longitudinal pre-post assessment. *Health and Quality of Life Outcomes, 2*, 4. doi:10.1186/1477-7525-2-4
- Brockopp, D.Y., Brockopp, G., Warden, S., Wilson, J., Carpenter, J.S., & Vandever, B. (1998). Barriers to change: A pain management project. *International Journal of Nursing Studies, 35*, 226–232. doi:10.1016/S0020-7489(98)00035-2
- Burkhardt, C.S., & Jones, K.D. (2005). Effects of chronic widespread pain on the health status and quality of life of women after breast cancer surgery. *Health and Quality of Life Outcomes, 3*, 30. doi:10.1186/1477-7525-3-30
- Cella, D., Tulsky, D.S., Gray, G., Sarafian, B., Linn, E., Bonomi, A., . . . Harris, J. (1993). The Functional Assessment of Cancer Therapy Scale: Development and validation of the general measure. *Journal of Clinical Oncology, 11*, 570–579.
- Chang, M.C., Chang, Y.C., Chiou, J.F., Tsou, T.S., & Lin, C.C. (2002). Overcoming patient-related barriers to cancer pain management for home care patients. A pilot study. *Cancer Nursing, 25*, 470–476. doi:10.1097/00002820-200212000-00012
- Chang, V., Hwang, S., & Kasimis, B. (2002). Longitudinal documentation of cancer pain management outcomes: A pilot study at a VA medical center. *Journal of Pain and Symptom Management, 24*, 494–505.
- Clotfelter, C.E. (1999). The effect of an educational intervention on decreasing pain intensity in elderly people with cancer. *Oncology Nursing Forum, 26*, 27–33.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohen, M.Z., Easley, M.K., Ellis, C., Hughes, B., Ownby, K., Rashad, B.G., . . . Westbrook, J.B. (2003). Cancer pain management and the JCAHO's pain standards: An institutional challenge. *Journal of Pain and Symptom Management, 25*, 519–527. doi:10.1016/S0885-3924(03)00068-X
- Dahl, J.L. (2004). Pain: Impediments and suggestions for solutions. *Journal of the National Cancer Institute. Monographs, 32*, 124–127. doi:10.1093/jncimonographs/lgh022
- Dalton, J., Keefe, F.J., Carlson, J., & Youngblood, R. (2004). Tailoring cognitive-behavioral treatment for cancer pain. *Pain Management Nursing, 5*, 3–18. doi:10.1016/S1524-9042(03)00027-4
- Daut, R.L., Cleeland, C.S., & Flanery, R. (1983). Development of the Wisconsin Brief Pain Questionnaire to assess pain in cancer and other diseases. *Pain, 17*, 197–210.
- de Wit, R., van Dam, F., Loonstra, S., Zandbelt, L., Van Buuren, A., van der heijden, K., . . . Abu-Saad, H.H. (2001). Improving the quality of pain treatment by a tailored pain education programme for cancer patients in chronic pain. *European Journal of Pain, 5*, 241–256.
- Eltling, E.S., Keefe, D.M., Sonis, S.T., Garden, A.S., Spijkervet, F.K., Barasch, A., . . . Burden of Illness Head and Neck Writing Committee. (2008). Patient-reported measurements of oral mucositis in head and neck cancer patients treated with radiotherapy with or without

- chemotherapy: Demonstration of increased frequency, severity, resistance to palliation, and impact on quality of life. *Cancer*, 113, 2704–2713. doi:10.1002/cncr.23898
- Fahey, K.F., Rao, S.M., Douglas, M.K., Thomas, M.L., Elliott, J.E., & Miaskowski, C. (2008). Nurse coaching to explore and modify patient attitudinal barriers interfering with effective cancer pain management. *Oncology Nursing Forum*, 35, 233–240. doi:10.1188/08.ONF.233-240
- Ferreira, K.A., Kimura, M., Teixeira, M.J., Mendoza, T.R., da Nobrega, J.C., Graziani, S.R., & Takagaki, T.Y. (2008). Impact of cancer-related symptom synergisms on health-related quality of life and performance status. *Journal of Pain and Symptom Management*, 35, 604–616. doi:10.1016/j.jpainsymman.2007.07.010
- Fortner, B.V., Demarco, G., Irving, G., Ashley, J., Keppler, G., Chavez, J., & Munk, J. (2003). Description and predictors of direct and indirect costs of pain reported by cancer patients. *Journal of Pain and Symptom Management*, 25, 9–18.
- Given, B., Given, C.W., McCorkle, R., Kozachick, S., Cimprich, B., Rahbar, M.H., & Wojcik, C. (2002). Pain and fatigue management: Results of a nursing randomized clinical trial. *Oncology Nursing Forum*, 29, 949–955.
- Given, C.W., Given, B., Azzouz, F., Stommel, M., & Kozachick, S. (2000). Comparison of changes in physical functioning of elderly patients with new diagnoses of cancer. *Medical Care*, 38, 482–493.
- Harris, K., Chow, E., Zhang, L., Velikova, G., Bezjak, A., Wu, J., . . . EORTC Quality of Life Group. (2009). Patients' and healthcare professionals' evaluations of health-related quality-of-life issues in bone metastases. *European Journal of Cancer*, 45, 2510–2518. doi:10.1016/j.ejca.2009.05.024
- Hill, C.S., Jr. (1993). The barriers to adequate pain management with opioid analgesics. *Seminars in Oncology*, 20(2, Suppl. 1), 1–5.
- Holen, J.C., Lydersen, S., Klepstad, P., Loge, J.H., & Kassa, S. (2008). The Brief Pain Inventory: Pain's interference with functions is different in cancer pain compared with noncancer chronic pain. *Clinical Journal of Pain*, 24, 219–225. doi:10.1097/AJP.0b013e31815ec22a
- Holzner, B., Kemmler, G., Cella, D., De Paoli, C., Meranger, V., Koop, M., . . . Sperner-Unterwieser, B. (2004). Normative data for functional assessment of cancer therapy. *Acta Oncologica*, 43, 153–160. doi:10.1080/02841860310023453
- Jahn, P., Kitzmantel, J.P., Renz, P., Kukk, E., Kuss, O., Thoke-Colberg, A., . . . Landenberger, M. (2010). Improvement of pain-related self-management for oncologic patients through a transinstitutional modular nursing intervention: Protocol of a cluster randomized multicenter trial. *Trials*, 11, 29. doi:10.1186/1745-6215-11-29
- Kalauokalani, D., Franks, P., Oliver, J.W., Meyers, F.J., & Kravitz, R.L. (2007). Can patient coaching reduce racial/ethnic disparities in cancer pain control? Secondary analysis of a randomized controlled trial. *Pain Medicine*, 8, 17–24. doi:10.1111/j.1526-4637.2007.00170.x
- Karnofsky, D.A., & Burchenal, J.H. (1949). The clinical evaluation of chemotherapeutic agents in cancer. In C.M. Macleod (Ed.), *Evaluation of chemotherapeutic agents* (pp. 191–205). New York, NY: Columbia University Press.
- McGuire, D.B. (2004). Occurrence of cancer pain. *Journal of the National Cancer Institute. Monographs*, 32, 51–56. doi:10.1093/jncimonographs/lgh015
- McHorney, C.A., Ware, J.E., & Raczek, A.E. (1993). The MOS 36-Item Short Form Health Survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. *Medical Care*, 31, 247–263.
- Miaskowski, C., Dodd, M.J., West, C., Paul, S.M., Schumacher, K.L., Tripathy, D., & Koo, P. (2007). The use of a responder analysis to identify differences in patient outcomes following a self-care intervention to improve cancer pain management. *Pain*, 129, 55–63. doi:10.1016/j.pain.09.031
- Miaskowski, C., Dodd, M.J., West, C., Schumacher, K.L., Paul, S.M., Tripathy, D., & Koo, P. (2004). Randomized clinical trial of the effectiveness of a self-care intervention to improve cancer pain management. *Journal of Clinical Oncology*, 22, 1713–1720. doi:10.1200/JCO.2004.06.140
- Mols, F., Coebergh, J., & van de Poll-Franse, L.V. (2007). Health-related quality of life and healthcare utilisation among older long-term cancer survivors: A population-based study. *European Journal of Cancer*, 43, 2211–2221. doi:10.1016/j.ejca.2007.06.022
- Niv, D., & Kreitler, S. (2001). Pain and quality of life. *Pain Practice*, 1, 150–161.
- 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.
- Prochaska, J.O., & DiClemente, C.C. (1984). *The transtheoretical approach: Crossing traditional boundaries of therapy*. Homewood, IL: Dow Jones-Irwin.
- Serlin, R.C., Mendoza, T.R., Nakamura, Y., & Cleeland, C.S. (1995). When is cancer pain mild, moderate, or severe? Grading pain severity by its interference with function. *Pain*, 61, 277–284.
- Sherman, A.C., Simonton, S., Latif, U., Plante, T.G., & Anaissie, E.J. (2009). Changes in quality-of-life and psychosocial adjustment among multiple myeloma patients treated with high-dose melphalan and autologous stem cell transplantation. *Biology of Blood and Marrow Transplantation*, 15, 12–20. doi:10.1016/j.bbmt.2008.09.023
- Sun, V.C.Y., Borneman, T., Ferrell, B., Piper, B., Koczywas, K., & Choi, K. (2007). Overcoming barriers to cancer pain management: An institutional change model. *Journal of Pain and Symptom Management*, 34, 359–369. doi:10.1016/j.jpainsymman.2006.12.011
- Syrjala, K., Abrams, J.R., Du Pen, A.R., Niles, R., & Rupert, J. (1995). *Relieving cancer pain* [Videotape]. Seattle, WA: Synaptic Medical Productions.
- Syrjala, K., Abrams, J.R., Polissar, N., Hansberry, J., Robinson, J., DuPen, S., . . . Du Pen, A.R. (2008). Patient training in cancer pain management using integrated print and video materials: A multi-site randomized controlled trial. *Pain*, 135, 175–186. doi:10.1016/j.pain.2007.10.026
- Thomas, M.L., Annis, D., & Hwang, S. (2004, April). *Examining the effectiveness of opiate use in cancer pain management: Variation across outpatient oncology clinic settings*. Paper presented at the Oncology Nursing Society 29th Annual Congress in Anaheim, CA.
- Thong, M., Mols, F., Coebergh, J., Roukema, J., & van de Poll-Franse, L.V. (2009). The impact of disease progression on perceived health status and quality of life of long-term cancer survivors. *Journal of Cancer Survivorship: Research and Practice*, 3, 164–173.
- Vallerand, A.H., Hasenau, S., Templin, T., & Collins-Bohler, D. (2005). Disparities between Black and White patients with cancer pain: The effect of perception of control over pain. *Pain Medicine*, 6, 242–250. doi:10.1111/j.1526-4637.2005.05038.x
- Vallerand, A.H., Templin, T., Sasenau, S.M., & Riley-Doucet, C. (2007). Factors that affect functional status in patients with cancer-related pain. *Pain*, 132, 82–90. doi:10.1016/j.pain.2007.01.029
- van den Beuken-van Everdingen, M.H., de Rijke, J.M., Kessels, A.G., Schouten, H.C., van Kleef, M., & Patijn, J. (2007). Prevalence of pain in patients with cancer: A systematic review of the past 40 years. *Annals of Oncology*, 18, 1437–1449. doi:10.1093/annonc/mdm056
- Ward, S., Donovan, H., Gunnarsdottir, S., Serlin, R.C., Shapiro, G.R., & Hughes, S. (2008). A randomized trial of a representational intervention to decrease cancer pain (RIDCancerPain). *Health Psychology*, 27, 59–67. doi:10.1037/0278-6133.27.1.59
- Ward, S., & Gatwood, J. (1994). Concerns about reporting pain and using analgesics: A comparison of persons with and without cancer. *Cancer Nursing*, 17, 200–206.
- Ward, S., Goldberg, N., Miller-McCauley, V., Mueller, C., Nolan, A., Pawlik-Plank, D., . . . Weissman, D.E. (1993). Patient-related barriers to management of cancer pain. *Pain*, 52, 319–324.
- Ware, J.E., & Sherbourne, C.D. (1992). The MOS 36-item Short-Form Health Survey (SF-36). I. Conceptual framework and item selection. *Medical Care*, 30, 473–483.
- Wensing, M., Vingerhoets, E., & Grol, R. (2001). Functional status, health problems, age, and comorbidity in primary care patients. *Quality of Life Research*, 10, 141–148.
- Wittmann, M., Vollmer, T., Schweiger, C., & Hiddemann, W. (2006).

The relation between the experience of time and psychological distress in patients with hematological malignancies. *Palliative and Supportive Care*, 4, 357–363. doi:10.1017/S1478951506060469

Yates, P., Edward, H., Nash, R., Aranda, S., Purdie, D., Najman, J., . . . Walsh, A. (2004). A randomized controlled trial of a nurse-administered educational intervention for improving cancer pain

management in ambulatory settings. *Patient Education and Counseling*, 53, 227–237. doi:10.1016/S0738-3991(03)00165-4

Zimmerman, C., Burman, D., Swami, N., Krzyzanowska, M.K., Leigh, N., Moore, M., . . . Tannock, I. (2010). Determinants of quality of life in patients with advanced cancer. *Supportive Care in Cancer*, 19, 621–629. doi:10.1007/s00520-010-0866-1

## [For Further Exploration](#)

### Use This Article in Your Next Journal Club Meeting



Journal club programs can help to increase your ability to evaluate the literature and translate those research findings to clinical practice, education, administration, and research. Use the following questions to start the discussion at your next journal club meeting. At the end of the meeting, take time to recap the discussion and make plans to follow through with suggested strategies.

1. What is motivational interviewing?
2. How does motivational interviewing differ from counseling?
3. What is the purpose of having a control group? What was the intervention for the control group?
4. What is stratification and why was it important to stratify participants in this study based on (a) pain and (b) cancer therapy?
5. In the discussion section of the article, the authors state, “Cancer pain does not exist in a vacuum.” What do you think this means? How does this concept affect the efforts of the nurse to manage cancer pain?
6. In our practice, what types of nonpharmacologic resources do we provide to help patients manage cancer pain? Do you feel these resources are effective? Why or why not?

Visit [www.ons.org/Publications/VJC](http://www.ons.org/Publications/VJC) for details on creating and participating in a journal club. Photocopying of this article for discussion purposes is permitted.