

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

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Despite 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.

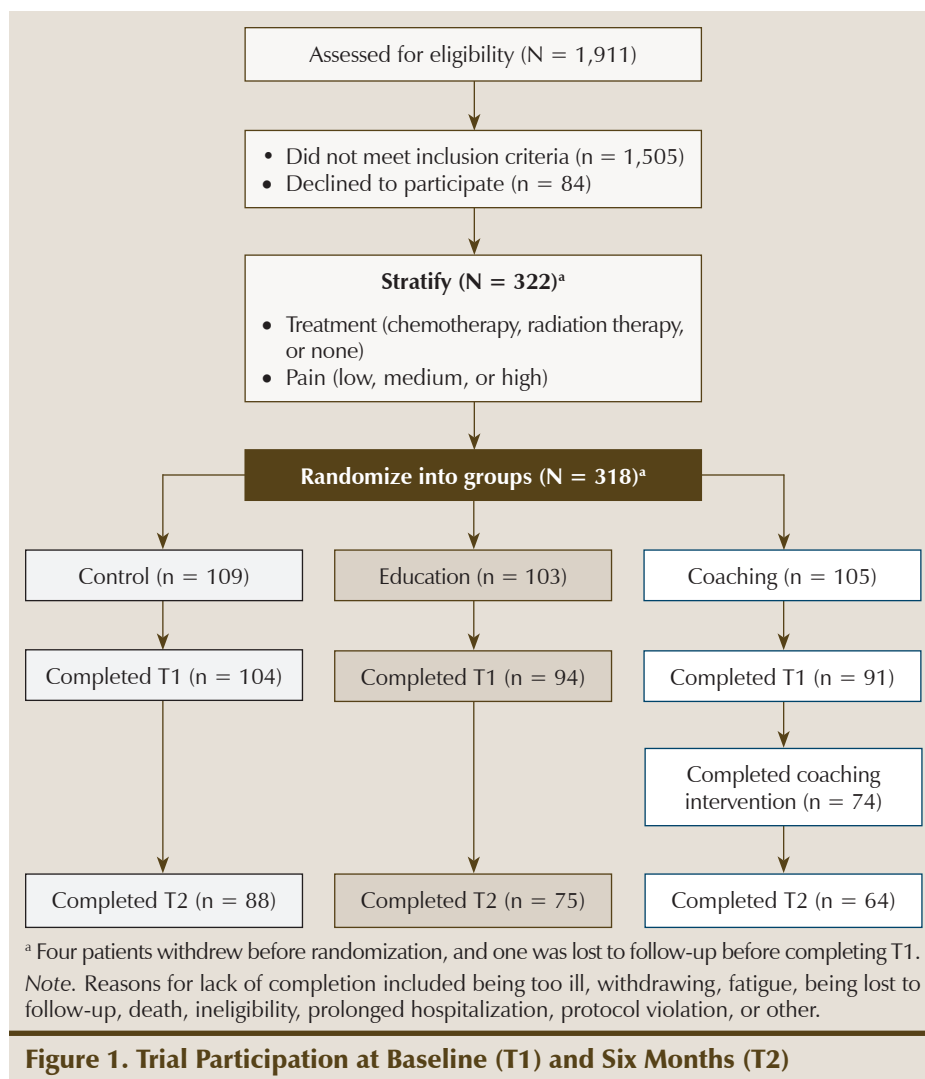


Figure 1. Trial Participation at Baseline (T1) and Six Months (T2)

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[®]) (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) ^a		Education (N = 75) ^b		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 ^c	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
Gender							$\chi^2 = 4$; p = 0.13
Male	79	90	71	95	54	84	
Female	9	10	4	5	10	16	
Ethnicity							$\chi^2 = 13.4$, 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	
Marital status							$\chi^2 = 8.3$, 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	
Living arrangements							$\chi^2 = 6.4$, 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	
Employment							$\chi^2 = 10.1$, 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	
Cancer diagnosis							$\chi^2 = 45.7$, 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

^a Because patients could refuse to complete items, N = 86 for ethnicity and employment.

^b Because patients could refuse to complete items, N = 74 for ethnicity, marital status, and employment.

^c 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

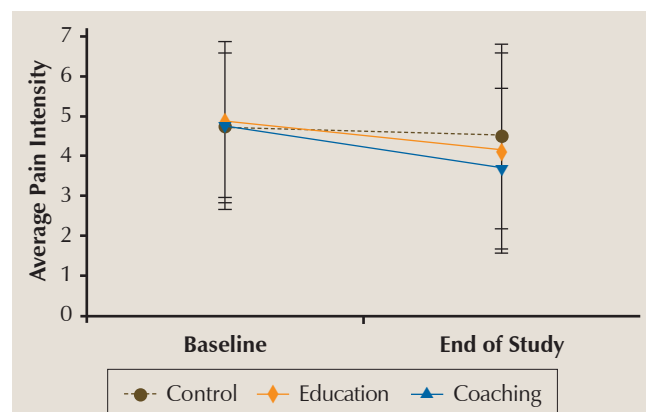
Sample

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

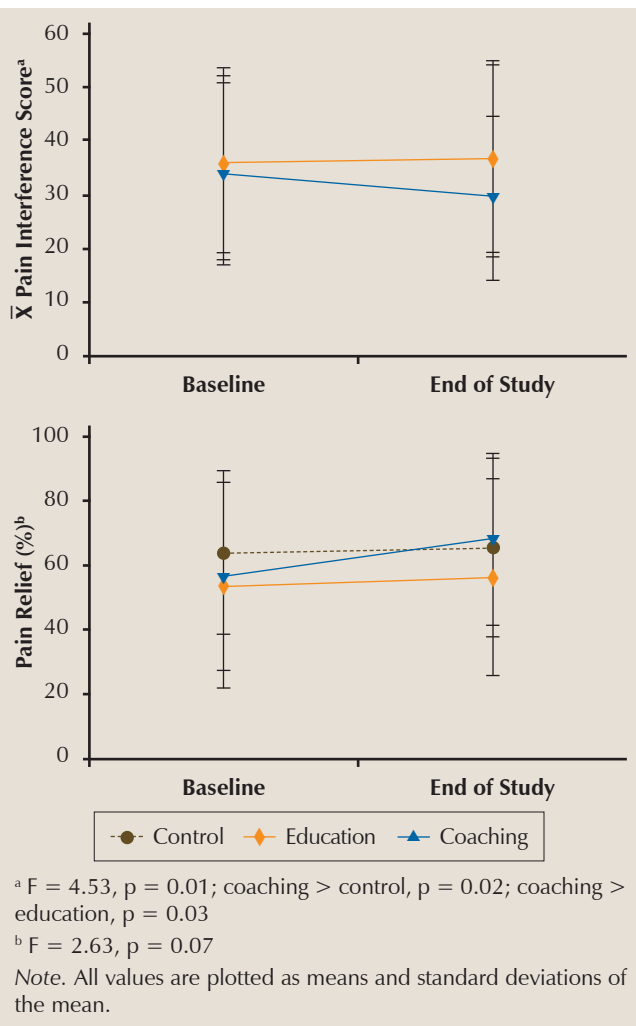


Figure 3. Changes Over Time in Mean Pain Interference and Pain Relief Scores by Group

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 (Kalaoukalani 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	
Physical functioning							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	
Body pain							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	
General health							F = 4.249, p = 0.015 ^a
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	
Vitality							F = 3.963, p = 0.02 ^b
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	
Mental health							F = 3.207, p = 0.042 ^c
Prestudy	64	20.6	62.3	21.2	66.3	19.4	
Post-study	63.6	19.3	62	22	70.8	20.4	
Mental component							F = 3.397, p = 0.035 ^d
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	

^a Coaching > education, p = 0.016

^b Coaching > education, p = 0.02

^c Coaching > control, p = 0.089; coaching > education, p = 0.07

^d Coaching > control, p = 0.043

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

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.

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	
Physical well-being							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	
Social well-being							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	
Emotional well-being							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	
Functional well-being							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	
Total score							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, Vingerhoets, & 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.

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