

Do Patients' Beliefs Act as Barriers to Effective Pain Management Behaviors and Outcomes in Patients With Cancer-Related or Noncancer-Related Pain?

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Purpose/Objectives: To understand the role of patients' beliefs in pain management in a cancer population treated in a primary care setting.

Design: Secondary analyses of data from the baseline phase of a randomized study.

Setting: Eight of the largest primary care clinics in a managed care system.

Sample: 342 patients with cancer who reported pain that would not dissipate on its own or when treated by over-the-counter medication; approximately half had pain that was not cancer related.

Methods: Telephone interviews.

Main Research Variables: Patients' demographic characteristics, self-reported history and beliefs about pain and pain treatment, willingness to report pain and take pain medication, recent pain intensity, and administrative data on opioid prescriptions.

Findings: Patients' beliefs were not associated strongly with reporting pain or taking medication. Regression analyses revealed that patients' beliefs played a limited role in predicting recent pain intensity, whereas the providers' pain management practices seemed to have a far greater predictive role. Additionally, among patients with recent moderate to severe pain, the relationship between patients' beliefs and their history of pain and pain treatment further suggests that beliefs are likely to be formed, in part, as a consequence of the care they receive. Results did not depend on whether the cause of pain was related to cancer.

Conclusion: Patients' beliefs were important barriers to effective pain management, either as direct or indirect determinants of pain. Providers' pain management practices were more likely to determine the level of pain relief achieved and the beliefs their patients came to hold based on their personal experiences.

Implications for Nursing: Nursing interventions should examine the impact of evaluating patients' beliefs in conjunction with pain assessment on pain-related behaviors and pain relief, as well as the ability of patient educational efforts to strengthen accurate beliefs and enable patients to assert themselves when interacting with less knowledgeable providers.

Key Points . . .

- ▶ Patients who were older, less educated, or unemployed had greater concern about pain and pain treatment.
- ▶ Patients were most concerned about the addictive side effects of pain medication and believed that pain indicates that the illness has worsened, even when controlling cancer-related pain.
- ▶ Provider pain management practices seem to have a greater impact on recent pain than patients' beliefs, independent of whether the pain was cancer related.
- ▶ Patients' beliefs about pain and its management may arise from their experiences of pain treatment.

the trend toward survivorship (Satryan) and the assertion that even the most ill cancer populations may have a significant percentage of patients whose pain is not the result of their disease or its treatment (Cleeland et al., 1994). In particular, research about patient barriers to effective pain management

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Most research about managing pain in patients with cancer has focused on inpatients or outpatients being treated in oncology clinics, despite the decentralization of cancer care and the dispersal of oncology nurses from the bedside to other care points, including managed care services and primary care offices (Satryan, 2001). This research has focused further on cancer pain, which overlooks

has dealt almost exclusively with cancer pain in patients treated in specialty settings or chronic nonmalignant pain in patients without cancer. To extend this research, the authors considered a primary care sample of patients with cancer who reported pain that would not dissipate on its own or when treated by over-the-counter medication. Drawn from a cancer population of actively treated patients and closely monitored survivors, the primary care sample has sufficiently high occurrences of noncancer pain to allow analysis of patient barriers to be stratified by cause of pain.

Literature Review

Research on barriers to cancer pain management in the primary care setting has been sparse and limited to physicians' knowledge and attitudes (Elliott et al., 1995; Morley-Forster, Clark, Speechley, & Moulin, 2003). Therefore, reviewing the literature about the role of patient factors in managing cancer pain or pain in noncancer populations is useful. Patients' beliefs about pain and its treatment may influence their willingness to report pain and use analgesics and may play a substantial role in pain management. In particular, a number of studies reported that patients are concerned about using opioids for pain relief (Berry, Wilkie, Huang, & Blumenstein, 1999; Bostrom, 1997; Paice, Toy, & Shott, 1998; Riddell & Fitch, 1997; Ward, Carlson-Dakes, Hughes, Kwekkeboom, & Donovan, 1998; Ward et al., 1993; Ward & Gatwood, 1994; Yeager, Miaskowski, Dibble, & Wallhagen, 1997) and that concern about opioid use, in turn, may interfere with adherence to analgesic regimens (Ersek, Kraybill, & Pen, 1999; Ferrell & Schneider, 1988; Thomason et al., 1998). Consequently, several investigators have conducted studies to better understand the effect of patients' beliefs and concerns and the barriers they may pose to effective pain management.

In 1979, Jacox examined reported pain among 102 patients grouped according to whether their pain experiences were short term (e.g., the result of recent surgery), long term (e.g., caused by rheumatoid arthritis), or progressive (e.g., caused by metastatic cancer). She concluded that most of the patients tried to ignore or conceal their pain because they did not like to discuss it with others (short- and long-term groups) or they attached a social stigma to complaining about pain (progressive group). A more recent population-based telephone survey of 1,004 adults (Bostrom, 1997) documented the effect of people's attitudes toward pain medications on their use of analgesics. These survey results showed that nearly half of the respondents avoided medication unless the pain "gets bad" because they were concerned particularly about addiction and tolerance.

Similarly, Ward et al. (1993) found that, among 230 outpatients with cancer being treated at oncology clinics, those who were undermedicated had significantly greater concerns about reporting pain and using analgesics, as measured by the Barriers Questionnaire (BQ), a 27-item instrument for assessing patients' beliefs. An analogous result was found among 182 outpatients whose pain during the prior week was cancer related (Ward et al., 1998). In contrast, using the same questionnaire, Ward and Gatwood (1994) reported that greater patient concerns were not significantly associated with additional hesitation to report pain or use analgesics among 53 adults with cancer and 40 without a cancer diagnosis. However, of the 56 patients who responded to the BQ one week later, those who expressed hesitancy in report-

ing pain had significantly greater concerns. Du Pen et al. (2000) also found no significant relationship between BQ scores and adherence to pain medication regimens (opioids, nonsteroidal anti-inflammatory drugs, and neuropathic coanalgesics) among 105 individuals treated in community outpatient oncology clinics. Thomason et al. (1998) noted that although half of 239 outpatients with cancer expressed concern about being able to tolerate pain medication, only 17% reported that this concern kept them from taking their medication on schedule. Other concerns, such as side effects and addiction, had even less impact on patients' analgesic use.

Related research on cancer pain management has demonstrated that patient education interventions can significantly affect patients' knowledge or concerns about pain management, as well as their compliance with pain medication (Dalton, 1987; Rimer et al., 1987). However, these studies did not find that the intervention resulted in significantly decreased levels of pain; but in their study of 230 outpatients with cancer, Rimer et al. reported near-significant results. In one controlled trial, patients who received an experimental patient education intervention in combination with the use of a pain diary had significantly increased pain knowledge and significantly reduced pain intensity (de Wit et al., 1999).

The research just described strongly suggests that patients' beliefs and concerns may be major barriers to effective pain management, although evidence is conflicting about the relationships among patients' beliefs and their pain-related behaviors and self-reported pain. This inconsistency does not seem attributable to the design of the previous studies but may be indicative of the underlying complexity of the connection among these interrelated factors. In particular, the literature is unclear regarding whether patients' beliefs and their impact on willingness to report pain and use analgesics depend directly on demographic characteristics such as age or gender. For example, older patients may be more reluctant to use analgesics because they have greater concerns about addiction and side effects of medication. Alternatively, the correlation of such concerns with analgesic use might be the result of the separate effects of age on each of these factors (e.g., older patients may have greater concerns about addiction and side effects of medication, but their reluctance stems from being on fixed incomes). Similar issues arise in trying to determine the relationship between patients' beliefs about pain and their actual pain experiences. Patients' beliefs may play a determinative role, albeit indirectly, in shaping pain management experiences by inhibiting their willingness to report pain or take prescribed medications. In addition, patients' beliefs may be shaped, at least in part, by their experiences and interactions with their healthcare providers. In this case, belief would follow from experience rather than conversely. In 1993, Ward et al. called for further research to explore the question, "Are patients' beliefs the result of interacting with a provider who under medicates, or do preexisting, a priori beliefs somehow lead to patient behaviors that are themselves the cause of under medication?"

Purpose

To better understand the role of patients' beliefs in pain management, the authors used cross-sectional data from 342 patients with cancer in a managed care, primary care setting. These data were collected as part of a randomized, controlled

study of an intervention to improve pain management of patients with cancer (Dawson et al., 2002). The rationale for using a primary care sample in the intervention derived from the increased responsibility that primary care clinicians have for patients with cancer over time, regardless of the presence or absence of disease (Miaskowski et al., 2001), coupled with the ubiquity of pain as a presenting symptom in healthcare consultations, including primary care visits (Ersek et al., 1999; Ferrell, Cohen, Rhiner, & Rozek, 1991). This rationale extends to the secondary analyses reported here that focus specifically on patients' beliefs about pain and pain treatment. Four main questions were posed: (a) Do patients' beliefs vary with demographic characteristics in the primary care setting and, if so, how? (b) Are patients' beliefs related to their willingness to report pain and take medication, after controlling for cause of pain and demographics? (c) Are patients' beliefs related to recent pain, after controlling for patients' willingness to report pain or take medication, history of pain and pain treatment, and demographics? and (d) Do patients' history of pain and pain treatment provide insight into the dynamic process between patients' beliefs and their pain management? In these analyses, the authors considered cause of pain to understand the potential impact of this important clinical factor.

Methods

Setting

The intervention study was conducted in a managed care system that includes a multispecialty group practice employing 200 physicians in 23 specialties in 13 geographically distinct primary care sites located throughout central Massachusetts. The eight largest sites participated in the study. Approximately 90% of clinic patients were members of the health plan, a state-licensed, federally qualified group model health maintenance organization with a membership of about 200,000, including a senior plan with more than 30,000 Medicare-eligible enrollees.

Sample

Patients with cancer receiving primary care who had two or more cancer-related visits in a six-month period and one or more primary care visit during the last two of those six months were identified through the agency's integrated medical and pharmacy database. A cancer-related visit could be with any type of provider and was defined as a visit to a clinic during which a cancer code was assigned; an inpatient, outpatient, or procedural hospital visit in which a cancer code was assigned; or a refill of a prescription for an oral chemotherapeutic agent.

Patients identified by database criteria were contacted by telephone to be screened for pain that typically would be treated in primary care (defined as eligible pain). The screening algorithm (see Figure 1) distinguished between patients whose pain began more than 12 months earlier from those with pain that started during the past year. This facilitated the exclusion of patients with short-term pain resulting from recent surgery and patients with long-term recurring pain that did not require care by a nurse or doctor. Extensive pilot testing, including a comparison of interview results to information abstracted from patients' medical records, validated the screening algorithm. Only patients who reported eligible pain were interviewed.

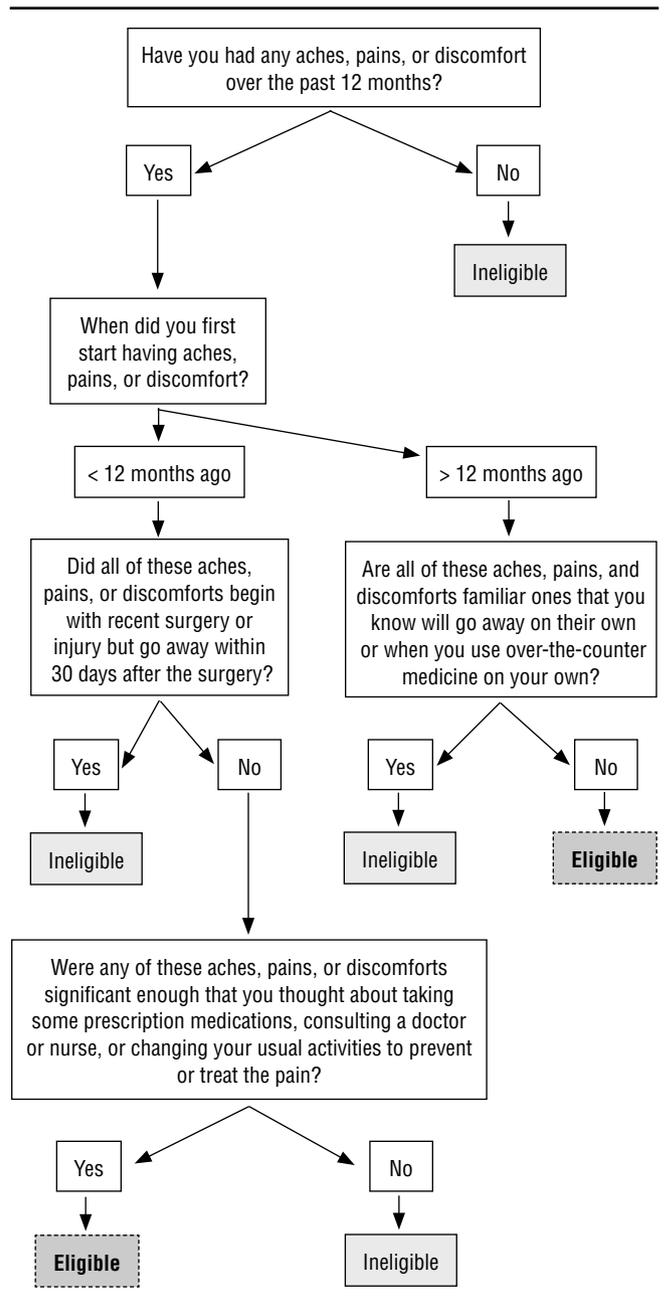


Figure 1. Screening Algorithm for Identifying Pain in Patients With Cancer Who Typically Would Be Treated in a Primary Care Setting

All interviewing was conducted over the telephone by trained research assistants with expertise in healthcare research. Informed consent was obtained by mailing a letter describing the study prior to any telephone contact and by requesting verbal agreement after reading an explicit statement of consent to the patient. The study procedures were approved by the institutional review board at Education Development Center, Inc., and the participating managed care system.

Measures

Recent pain and pain treatment: The **Brief Pain Inventory (BPI)** (Daut, Cleeland, & Flanery, 1983) was used to measure

the intensity and cause of patients' pain during the prior three days. Subjects were asked to rate their worst, least, average, and current pain using a 10-point scale (0 = no pain to 10 = pain as bad as you can imagine). Analyses are based on the report of worst pain to avoid averaging across the peak-and-trough pattern of pain severity that may arise from as-needed administration of analgesics (Ward & Gordon, 1996). Subjects also were asked about the types of medications they were using for pain during the prior three days. From these data, an indicator of recent opioid use was derived, including weak opioids (e.g., codeine, hydrocodone, short-acting oxycodone) and strong opioids (e.g., morphine, hydromorphone, fentanyl, long-acting oxycodone) in this medication category (American Pain Society, 2003b). The reliability and validity of the BPI have been demonstrated previously (Cleeland, 1990; Daut et al.).

Patients' beliefs about pain and pain treatment: As recommended by the American Pain Society Quality of Care Committee (1995), a single item from the **BQ** (Ward et al., 1993) was used to assess patients' beliefs in each of seven domains. Table 1 lists the domains and the item used to measure each domain. Patients were asked to rate their agreement with each belief using a four-point unbalanced forced-choice scale (0 = do not agree at all, 1 = slightly agree, 2 = moderately agree, and 3 = agree very much). The total belief score was calculated for each patient by taking the average of that patient's ratings across the seven items; higher average scores indicated greater concern. The internal consistency alpha for the total belief score was 0.71 for this sample, which is similar to that obtained by the American Pain Society Quality of Care Committee (alpha = 0.72). A dichotomous coding for each belief also was created according to whether a patient expressed at least partial agreement (rating greater than or equal to 1).

History of pain and pain treatment: Patients were asked to describe any changes in cause of pain by the way their pain was managed outside of the hospital and to consider their pain and care during the prior year by selecting one of five possible descriptions. Table 2 provides abbreviated and complete descriptions of the five choices. Because patients whose pain went away without treatment were not eligible for the study, this description was not included as a possible response. To further understand pain treatment, an administrative database was used to determine whether a patient had received an opioid prescription from a primary care doctor, nurse practitioner, or specialist during the prior six months.

Patients' willingness to report pain and take medication: Patients were asked how often they reported their pain to their

Table 1. Measuring Patients' Beliefs

Domain	Barriers Questionnaire Item
Fatalism	Pain medicine cannot really control pain.
Fear of addiction	People get addicted to pain medicine easily.
Desire to be a good patient	Good patients avoid talking about their pain.
Concerns about side effects	It is easier to put up with pain than with the side effects that come from pain medication.
Fear of distracting the doctor	Complaints of pain could distract a doctor from treating my underlying illness.
Concerns about tolerance of analgesics	Pain medicine should be "saved" in case the pain gets worse.
Increased pain means disease progression	The experience of pain is a sign that the illness has gotten worse.

Table 2. Self-Reported History of Pain Treatment

Brief Description	Complete Description
No change, never treated for pain	No change in pain, never took any pain medications or received any other treatment
No change, treated for pain	No change in pain, took pain medication or received some other treatment
Pain went up and down, never treated for pain	Pain comes and goes, never took any pain medication or received any other treatment
Pain went up and down, treated for pain	Pain went down after taking pain medication or receiving some other treatment but went up again before the next dose or next treatment
Pain down, treated for pain	Pain went down after taking pain medication or receiving some other treatment and stayed down

doctor or nurse when in pain and how likely they were to take pain medication prescribed by their doctor or nurse practitioner during the prior year using five-point Likert-type scales. Patients' responses were scored from 1 (always) to 5 (never). The second question was asked only if a patient indicated that the doctor or nurse practitioner had prescribed medication for pain during the prior year. Patients' self-reports about taking prescribed pain medication were internally consistent with how they described their pain treatment in the prior year: Patients who indicated that they took pain medication or received other treatment when describing changes in their pain were eight times more likely to report taking prescribed pain medication at least some of the time (chi-square = 17.36, $p < 0.01$). All patients also were asked to indicate whether they were "very likely," "somewhat likely," or "not at all likely" to take an opioid if a doctor or nurse practitioner prescribed it and advised them that it would not be addicting if used according to instructions.

Results

Figure 2 provides a detailed description of the disposition of 1,560 patients with cancer being seen in primary care during baseline data collection; responses from 342 eligible subjects were analyzed.

Sixty percent of the subjects were female. Most subjects were age 65 or older (65%), with a greater proportion of male subjects being older. Seventy-six percent of men were age 65 or older, compared to 58% of women. Similar to the population of patients served by the healthcare system, about 97% of the subjects were Caucasian. About 24% were employed, 10% were disabled or on a leave of absence from work as a result of illness, and 65% were retired. Seventeen percent had not completed high school, 41% completed only high school, and 42% had some education beyond high school. About 68% of patients were married. About 25% of patients were diagnosed with breast cancer, 14% with prostate cancer, 10% with colorectal cancer, 8% with lung cancer, 6% with hematologic cancer, 4% with female reproductive cancers, and 33% with other types of cancer. Forty-seven percent of the patients attributed the cause of their pain to cancer.

Description of Patients' Beliefs

The mean scores for the seven belief items and total belief score are presented in Table 3. On average, the greatest concern

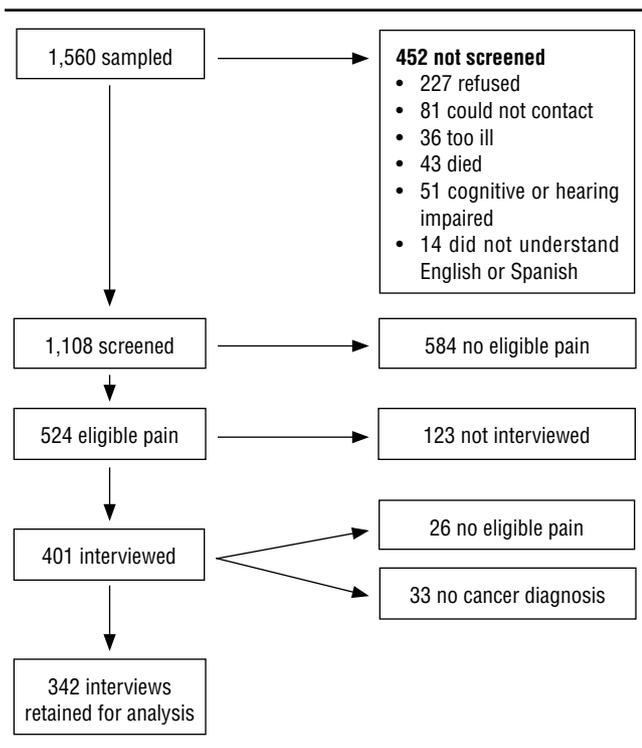


Figure 2. Disposition of Sampled Cases

was about the addictive effects of taking pain medication, with 85% of patients expressing at least some agreement (rating ≥ 1). Ratings for “pain is a sign the illness is worse” were similar. In contrast, 45% had no concern about the distracting effects of complaining, as reflected by the lowest mean score. Almost two-thirds of patients agreed that pain and pain interference were inevitable: 63% rated “pain medication cannot control pain” as 1 or more. The mean score for this belief, 1.97, shows that, on average, patients expressed a moderate degree of fatalism.

Demographic Correlates of Patients’ Beliefs

Total belief scores for patients varied by demographic characteristics and cause of pain. T tests were used to determine associations between patients’ total belief scores and demographic variables with two categories (age, sex, marital status, cause of pain) and F tests for those with three categories (education, employment status). Significantly greater concern was expressed by patients who were at least 65 years of age ($p < 0.01$), unmarried ($p < 0.05$), and less educated ($p < 0.05$) (higher scores indicate greater concern). Compared to employed patients, those who were unemployed or disabled also were significantly more concerned ($p < 0.01$).

The analyses for the total belief score were carried out for each belief item. These results were similar to those for the total belief scores, although the specific concerns varied according to demographic characteristics. Older patients expressed significantly greater concern that “pain medication cannot control pain” ($p < 0.01$) as did men ($p < 0.05$), unmarried patients ($p < 0.05$), and unemployed or disabled patients ($p < 0.05$). Older patients also were more concerned that “good patients avoid talking about their pain” ($p < 0.01$). Men expressed more concern than women that “complaining

about pain may distract the doctor” ($p < 0.01$). Patients with less than a high school education had the greatest concerns about “talking about their pain” ($p < 0.05$) and “pain medication should be saved” ($p < 0.05$). Unemployed patients had more concern about “talking about pain” ($p < 0.01$) and “pain is a sign the illness is worse” ($p < 0.01$) compared to disabled or employed patients. Employed patients had the least concern that “complaining about pain distracts the doctor” ($p < 0.01$). Only unmarried patients expressed significantly greater fear about addiction ($p < 0.05$).

Description of Patients’ Willingness to Report Pain and Take Medication

Overall, 316 patients indicated that they reported their pain at least some of the time (25% always, 13% frequently, 35% sometimes, 17% rarely, 10% never); 26 patients did not provide a valid response to the question about reporting pain. Patients who reported receiving a prescription from their primary care doctor or nurse practitioner for pain medication during the prior year ($n = 173$) indicated an even greater likelihood of taking their pain medication when prescribed (67% always, 11% frequently, 14% sometimes, 4% rarely, 4% never), compared to the overall rates for reporting pain. Nearly half of these 173 patients who received a prescription said they would be very likely to take an opioid if a doctor or nurse practitioner prescribed it and advised them that the opioid would not be addictive if used according to instructions (48% very likely, 26% somewhat likely, 26% not at all likely). The ratings across all patients were similar (44% very likely, 25% somewhat likely, 31% not at all likely).

Partial Correlations of Patients’ Beliefs With Willingness to Report Pain and Take Medication

Table 4 summarizes three sets of correlation analyses that examine the relationship of each belief item and total belief score with patients’ willingness to report pain and take pain medication after controlling for demographic characteristics and the cause of the patient’s pain (cancer or not). The first two columns of Table 4 show that a patient’s beliefs are not strongly associated with how often the patient said he or she reported pain or took prescribed pain medication after adjustment for important background covariates. The one partial correlation that was statistically significant was of small magnitude; the degree of agreement with the belief “pain is a sign the illness is worse” was positively correlated with the frequency of reporting pain (partial $r = 0.122$, $p < 0.05$). The direction of this partial correlation was the same as that of the unadjusted correlation ($r = 0.101$, $p = 0.09$), suggesting that patients with progressive pain may not be reluctant to report their pain, as previously reported (Jacox, 1979). Other partial correlations of similar magnitude were in the expected direction, although not statistically significant. Specifically, the extent to which patients agreed with the belief that “people get addicted to pain medication easily” and that “pain medication should be saved” were inversely correlated with the frequency of taking medication prescribed for pain, after adjustment for demographics and cause of pain (partial $r = -0.13$, $p > 0.10$, for each belief).

Patients’ beliefs were significantly related to their degree of willingness to take an opioid if prescribed and if the doctor or nurse practitioner explained that addiction did not result with proper use, even after covariate adjustment. For

Table 3. Demographic Correlates of Patients' Pain Management Beliefs (Mean Score on Barriers Questionnaire Items)^a

Belief	Age ^b				Gender ^b		Married ^b		Education ^c			Employed ^c		Pain Cancer Related ^b	
	< 65 Years (n = 118)	65+ Years (n = 224)	Women (n = 206)	Men (n = 136)	No (n = 109)	Yes (n = 229)	< High School (n = 57)	High School (n = 131)	High School+ (n = 135)	Yes (n = 80)	No (n = 224)	Disabled (n = 34)	No (n = 172)	Yes (n = 150)	
	Total														
Pain medication cannot control pain.															
X	1.51	2.22***	1.77	2.26**	2.26	1.81**	2.04	1.97	1.95	1.25	2.20	2.26**	2.05	1.85	
SD	1.64	1.88	1.78	1.88	1.89	1.78	1.86	1.85	1.80	1.48	1.89	1.80	1.80	1.86	
People get addicted easily.															
X	3.05	3.11	3.12	2.95	3.37	2.92**	3.17	2.88	3.19	2.97	3.12	3.00	3.15	2.99	
SD	1.80	1.87	1.89	1.66	1.73	1.82	1.83	1.85	1.76	1.73	1.82	1.89	1.80	1.79	
Good patients avoid talking about pain.															
X	1.82	2.14***	1.65	2.07*	2.07	1.69	2.19	1.99	1.41**	1.19	2.14	1.26***	1.85	1.77	
SD	1.96	2.03	1.94	1.96	2.03	1.91	2.08	2.01	1.77	1.62	2.03	1.75	1.94	1.97	
Pain is easier than side effects.															
X	2.36	2.50*	2.46	2.19	2.51	2.28	2.56	2.52	2.08	2.00	2.44	2.67	2.31	2.44	
SD	1.81	1.83	1.82	1.79	1.91	1.76	1.88	1.85	1.76	1.70	1.83	1.88	1.72	1.85	
Complaining distracts the doctor.															
X	1.65	1.80*	1.35	2.11***	1.71	1.60	2.05	1.63	1.51	1.12	1.80	1.97**	1.71	1.59	
SD	1.85	1.88	1.79	1.87	1.90	1.83	2.01	1.89	1.79	1.56	1.91	1.98	1.90	1.81	
Pain medication should be saved.															
X	2.03	2.13	1.88	2.25	2.13	2.00	2.77	1.97	1.83**	1.71	2.21	1.76	1.87	2.20	
SD	2.00	2.04	2.04	1.92	2.05	1.98	2.05	2.00	1.97	1.78	2.05	2.10	1.97	2.04	
Pain is a sign the illness is worse.															
X	2.93	3.08*	2.87	3.02	3.18	2.79*	3.04	3.05	2.77	2.47	3.16	2.58***	2.85	2.94	
SD	1.81	1.79	1.78	1.85	1.75	1.83	1.90	1.82	1.79	1.68	1.80	1.97	1.74	1.92	
Total belief score															
X	2.25	2.43***	2.15	2.41*	2.47	2.15**	2.56	2.29	2.09**	1.79	2.45	2.20***	2.25	2.25	
SD	1.15	1.17	1.14	1.15	1.19	1.12	1.23	1.06	1.18	0.89	1.16	1.35	1.09	1.20	

* p < 0.10, ** p < 0.05, *** p < 0.01

^a Response choices: 0 = do not agree at all to 5 = agree very much

^b Comparison based on t test

^c Comparison based on F test

Note: Not every respondent answered all items on the questionnaire.

Table 4. Partial Correlations of Patients' Beliefs With Willingness to Report Pain and Take Medication^a

Patient Belief	Report Pain ^b (n = 316)	Take Prescribed Medication ^b (n = 173)	Take Opioids if Prescribed ^c (n = 316)
Pain medication cannot control pain.	-0.040	-0.047	-0.134**
People get addicted to pain medications easily.	-0.069	-0.130	-0.191***
Good patients avoid talking about their pain.	-0.029	-0.037	-0.002
Pain is easier than side effects.	-0.033	-0.093	-0.180***
Complaining distracts the doctor.	-0.107*	-0.001	-0.153**
Pain medication should be saved.	-0.028	-0.129	-0.082
Pain is a sign the illness is worse.	0.122**	-0.025	-0.032
Total belief score	-0.041	-0.096	-0.167***

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

^a Each cell provides the partial correlation of the patient belief represented in that row with the behavior in that column after controlling for demographic factors (age, gender, marital status, education, and employment) and cause of pain (cancer or not).

^b

^c Patients were asked about their willingness to take opioids if "a doctor or nurse prescribed it and advised you that it would not be addicting if used properly and according to their instructions."

example, concerns about addiction and side effects were inversely related to patients' willingness to take opioids (partial $r = -0.191$, $p < 0.01$ for addiction; partial $r = -0.18$, $p < 0.01$ for side effects). Significant partial correlations ranged in size from -0.117 to -0.191 .

Patients' Beliefs as Predictors of Recent Pain

Regression analyses were used to examine the multivariate relationship of a patient's beliefs about pain and its treatment with the intensity of the worst pain during the prior three days. Predictors of recent pain intensity were drawn from several domains: demographics, history of pain and pain treatment (i.e., cause of pain, changes in pain over the past year as a result of care outside the hospital, whether a primary care doctor or nurse practitioner prescribed pain medication during the prior year, and whether a primary care doctor, nurse practitioner, or specialist prescribed opioids during the prior six months), recent opioid use, patients' beliefs, and patients' willingness to report pain and take medication. Because a measure of the likelihood of taking prescribed pain medication was available only for 173 patients who received a pain prescription from their primary care provider in the past year, two separate models were fit. The first model, based on all available cases ($N = 317$), included as predictors how often a patient reported pain when talking to a primary care doctor or nurse during the prior year and the patient's degree of willingness to take opioids if prescribed by a doctor or nurse practitioner. The second model, based on 173 cases, also included as a predictor the likelihood that the patient took prescribed pain medication. For both models, stepwise procedures were used to identify independent predictors (p to enter = 0.05, p for removal = 0.10); the final multivariate model in each case excluded nonsignificant predictors. To further gauge the relative contribution of predictors, regression effects (changes in pain intensity on a scale of 0–10) that were smaller in magnitude than 1.5 were not considered clinically significant or consistent with findings on clinically important changes in pain severity using a visual analog scale (Gallagher, Liebman, & Bijur, 2001).

Table 5 displays the first regression model, which is based on all patients, regardless of whether their primary care

doctor or nurse practitioner prescribed any medication for pain. In this case, greater agreement with the belief "pain is a sign the illness is worse" was significantly associated with more severe recent pain ($b = 0.21$, $p < 0.05$), when controlling for other independent predictors. The direction of this relationship is consistent with increased concern of this type being indicative, in part, of progressive pain or disease. The strongest predictor of recent pain was whether the patient's pain decreased in the last year, accounting for approximately two-thirds of the adjusted $R^2 = 0.237$. In particular, having a history of sustained pain relief ("pain went down after taking pain medication or receiving treatment and stayed down") was associated with an approximate 2.7-point decrease in pain intensity on a 0–10 scale, relative to no change in pain during the past year (whether treated or not) ($b = -2.66$, $p < 0.001$). Another important predictor was the use of an opioid in the past three days ($b = 2.12$, $p < 0.001$), with recent opioid use predicting greater pain intensity.

Table 6 displays the regression model based on that subset of patients whose primary care doctor or nurse practitioner prescribed medication for pain during the past year. The belief that "pain is easier than side effects" was significantly associated with a small increase in pain severity ($b = 0.28$, $p < 0.05$). As previously noted, recent opioid use was a strong predictor of recent pain intensity ($b = 1.93$, $p < 0.01$). Also, as in

Table 5. Multiple Regression of Beliefs and Behaviors on Worst Pain in the Prior Three Days for All Patients

Variable (Reference Group for Dichotomous Measures)	Coefficient B	Significance Level
Women (men)	1.01	0.004
Pain went up and down (no change in pain)	0.13	0.437
Pain went down, treated for pain (no change in pain)	-2.66	0.000
Opioid use in the prior three days	2.12	0.000
Pain is a sign the illness is worse.	0.21	0.031

Adjusted $R^2 = 0.237$

Table 6. Multiple Regression of Beliefs and Behavior on Worst Pain in the Prior Three Days for Subset of Treated Patients

Variable (Reference Group for Dichotomous Measures)	Coefficient B	Significance Level
Pain went up and down, treated for pain (no change, treated for pain)	0.01	0.986
Pain went down, treated for pain (no change, treated for pain)	-3.09	0.000
Pain is easier than side effects.	0.28	0.031
Opioid use in the prior three days	1.93	0.001

Adjusted R² = 0.271

the first regression, having a history of sustained pain relief had the greatest effect, although the meaning of this result is somewhat altered because the reference group for the indicator “pain went down, treated for pain” was patients with no change in pain during the prior year after being treated for pain. In this case, the coefficient for “pain went down, treated for pain” shows that sustained relief was associated with an approximate three-point decrease in pain intensity, relative to no relief, when patients were treated for pain. Similarly, the coefficient for “pain went up and down, treated for pain” ($b = 0.01$, $p = 0.986$) indicates that, among treated patients, lack of sustained relief is comparable to no relief in terms of predictive effects for recent pain.

Patients’ beliefs played a limited role in predicting worst pain during the prior three days. However, pain-related variables, such as the patients’ beliefs about pain and pain treatment, may have been correlated with the patients’ past pain experiences, which was why these variables failed to be included in the final regression models. To determine whether other patients’ beliefs or willingness to report pain and take medication were confounded with pain history and, therefore, not predictive of recent pain, the indicators for changes in pain during the past year were removed from the predictor set for each model. No new variables were entered into either model when pain history was omitted from the regression analyses. The same check for confounding was repeated for recent opioid use.

The authors also “forced” cause of pain into both regression models, even though it was not independently related to recent pain intensity, to test for interactions with significant predictors; no interactions were significant. To further examine the potential impact of cause of pain on the relationship of patients’ beliefs with recent pain, the regression analyses were limited to those patients who reported cancer-related pain. The subgroup results were consistent with those from the full sample: Recent opioid use and a history of sustained pain relief were the strongest predictors, whereas other predictors remained modestly related to recent pain. Additionally, the belief that “pain is easier than side effects” was significantly associated with a small increase in pain severity ($b = 0.39$, $p < 0.05$) when added to the first regression model by stepwise selection.

To better understand the positive relationship between recent pain and opioid use in both models, the authors evaluated the adequacy of prescriptions for 33 patients with severe pain (intensity ≥ 7 on a scale of 0–10) in the prior three days

who received an opioid prescription at some time in the prior six months. These data were used to assess the potential role of providers’ pain management practices as determinants of patients’ pain and calibrate the patients’ self-reports on taking medication. All 33 patients indicated that, during the past year, they took their pain medication at least some of the time; none reported taking pain medication never or rarely. Prescriptions were coded and, according to the researchers, 10 patients were prescribed the wrong drug (routine propoxyphene prescriptions), 9 had insufficient quantity (not enough pills), 6 had inadequate dosing or incomplete titration (weak opioid prescribed when a strong opioid would have been indicated), and 2 had insufficient or inadequate prescription for breakthrough pain (short-acting opioid was insufficient given the long-acting opioid prescribed). Six cases could not be classified because of a small number of prescriptions, and no cases were classified as having received adequate pharmacologic pain management. These results suggest that the predictive effects of recent opioid use on pain intensity might be the result of less than optimal pain management. In particular, assuming that providers were more likely to prescribe opioids for patients in severe pain, lack of sustained pain relief because of inadequate prescribing could lead to a positive association between pain intensity and opioid use.

Relationship of Patients’ Beliefs With History of Pain and Its Treatment

To further assess whether patients’ beliefs serve as barriers to effective pain management, the authors examined how individual beliefs varied across the five categories of history of pain and its treatment among 164 patients whose worst level of pain during the past three days was moderate to severe (pain intensity ≥ 4 on a scale of 0–10). Because direct measurement of whether patients were undertreated was lacking, this criterion was used to identify patients whose pain was likely to be managed inadequately. These 164 patients were grouped according to how they described changes in their pain over the past year while outside the hospital: “no change, never treated for pain” ($n = 11$), “pain went up and down, never treated for pain” ($n = 13$), “no change, treated for pain” ($n = 25$), “pain went down, treated for pain” ($n = 17$), and “pain went up and down, treated for pain” ($n = 77$). Additionally, 21 patients indicated “other” in response to this question.

Two comparisons were constructed a priori, guided by the question raised by Ward et al. (1993), concerning whether patients’ beliefs were shaped by pain management experiences or whether the reverse was true. First, to assess whether fatalistic beliefs depended on the relief from pain medication, beliefs among treated patients whose pain went down were compared to those of treated patients whose pain did not change. Among patients who were treated, at least partial agreement (rating at least one on the BQ scale) with the belief “pain medication cannot control pain” was greater among those whose pain did not change, compared to those whose pain went down and possibly returned (92% agreement versus 55% agreement, $p < 0.025$). Because of skewed distributions of belief ratings within small subgroups, dichotomous coding was used for patients’ beliefs. This finding supports the assertion that regardless of whether it was sustained during the prior year, pain relief is associated with more positive patients’ beliefs, despite recent pain of moderate to severe intensity.

Second, to determine whether use of pain medication depends on beliefs about addiction and side effects, differences in these beliefs between treated and untreated patients were examined. At least partial agreement with the belief “people get addicted to pain medication easily” was greater among patients who never took medication or treatment, compared to those who were treated (97% agreement versus 80% agreement, $p < 0.025$). These untreated patients, however, comprised only 22% of those with recent moderate to severe pain and only 11% of the sample. This suggests that although the fear of addiction is high, even among treated patients, the impact of this belief may be quite limited.

Other relationships between beliefs and history of pain and its treatment also were explored. These comparisons showed that patients’ beliefs about discussing their pain were significantly related to changes in pain. Specifically, patients whose pain returned after being treated (“before next dose or next treatment”) were less likely to agree that “good patients avoid talking about their pain” (46% agreement versus 66% agreement, $p < 0.025$) and that “complaining about pain may distract the doctor” (35% agreement versus 68% agreement, $p < 0.001$), when compared to other patients with recent moderate to severe pain. These differences are consistent with the practice of as-needed administration of analgesics, which requires that patients request additional medication when their pain returns. The impact of either belief on the frequency that patients reported their pain appears to be weak, given the small correlations in Table 4 and that most patients reported their pain. Almost 40% of all patients always or frequently reported their pain, in contrast to 27% who never or rarely reported their pain.

Discussion

The descriptive results for this primary care sample of patients with cancer are consistent with previous findings based on data collected from outpatient oncology clinics that patients who were older, were less educated, or had lower incomes had higher scores on some of the BQ subscales (Ward et al., 1993), indicating greater concern about pain and its treatment. The current community-based study similarly found that agreement with the belief “good patients avoid talking about their pain” was greater among older patients, the unemployed, and the disabled. In contrast to the earlier study, this study’s authors also found that men expressed significantly greater agreement with the fatalistic belief that “pain medication cannot control pain” and were more concerned that “complaining about pain may distract the doctor.” Their greater concerns may reflect, in part, the characteristics of the sample (men were 1.3 times more likely than women to be at least 65 years of age), although men did not have significantly higher total belief scores.

The findings on demographic correlates raise the possibility that men, as a result of their beliefs, may be more likely to experience pain because of greater reluctance to report pain or take pain medication. However, when controlling for other factors, the regression analyses showed that women had significantly higher pain intensity during the prior three days. This result is consistent with the lack of strong relationships between patients’ beliefs and their willingness to report pain and take prescribed medication, after adjusting for demographic characteristics and cause

of pain. These weak or modest partial correlations are in agreement with Ward and Gatwood’s (1994) full-sample analysis of total BQ scores and patients’ hesitancy to report pain and take medication, as well as the analysis of Du Pen et al. (2000) regarding BQ scores and patient adherence to pain treatment regimens. Neither research group found significant relationships.

Certain beliefs, including those of greater concern to men, were moderately correlated with patients’ willingness to take an opioid if it was prescribed by a doctor or nurse practitioner and patients were told that the medication was not addicting with proper use. Modest rates of opioid use (21% of patients reported use within the past three days) and opioid prescriptions (33% of patients received one at some time during the past six months) would lessen the potential impact of those beliefs as barriers to effective pain management in this sample of patients. Also, only a quarter of the patients who received a prescription expressed unwillingness to take an opioid (if prescribed), possibly further limiting the negative impact of concerns about addiction and side effects.

Data failed to show that patients’ beliefs were barriers to effective pain management or direct or indirect determinants of patients’ pain, regardless of whether the cause of the pain was cancer related. For this study, the regression results revealed that only a limited role was played by patients’ beliefs in predicting recent pain intensity. A far greater role seemed to have been played by providers’ pain management practices. In particular, the most important determinant of patients’ recent pain was whether they experienced sustained relief when treated for pain, a possible indicator of effective pain management. Moreover, among patients who received a prescription from their provider, having a history of intermittent relief that is consistent with as-needed administration of analgesics was comparable to having a history of no relief, in terms of predictive effects on recent pain. Additionally, recent opioid use was associated with greater pain severity during the prior three days, after controlling for other independent predictors. The analysis of opioid prescriptions for patients in severe pain, which showed that almost all of prescriptions were inadequate in some way, may explain this result.

These findings provide some response to the question raised by Ward et al. (1993) as to whether negative beliefs about pain, as measured by the BQ, are the result of underprescribing by the provider or the cause of undermedication. The results suggest that patients’ beliefs are more an effect of undertreatment, not a cause. This interpretation is supported by the rate of opioid prescriptions for patients with pain severity associated with at least moderate pain interference (Cleeland, 1984): Only 41% of patients who reported recent worst pain intensity (i.e., ≥ 5 on 0–10 scale) received an opioid prescription at some time during the previous six months from their primary care doctor, nurse practitioner, or specialist. At least some of the unrelieved pain experienced by these patients likely derives from underprescribing. The occurrence of pain not caused by cancer likely is higher in this primary care sample than in Ward et al.’s (1993), but this should not preclude the appropriate use of opioids for patients suffering from chronic nonmalignant pain (Ballantyne & Mao, 2003; McQuay, 1999; Passik & Weinreb, 2000; Portenoy, 1996, 2000). In particular, arthritis was the cause of much of the noncancer pain. Opioids also are recommended for this pain,

when nonopioids or nonsteroidal anti-inflammatory drugs do not work (American Pain Society, 2003a; Roth, 2002).

The relationship between patients' beliefs and their history of pain and its treatment among those with recent moderate to severe pain further supports the idea that patients' beliefs are shaped, at least in part, by the care they receive. In particular, among patients in this subgroup who received medication or treatment for pain, those who experienced no relief during the past year expressed significantly greater agreement with the belief that "pain medication cannot control pain." Greater agreement with this belief also predicted significantly greater dissatisfaction by these and other patients with the way their pain was managed, a result derived from analysis of study baseline data reported by Dawson et al. (2002). This result is contrary to the idea that patients with lowered expectations tend to be more satisfied but is consistent with evidence that expectations change with accumulating experience (Sitzia & Wood, 1997). For example, if patients' initial expectations for pain relief are not fulfilled, they might adjust expectations downward yet still remain dissatisfied with their pain management.

The R^2 value for each regression was modest, regardless of whether the likelihood that patients took their medication was considered. This finding supports the existence of important unmeasured determinants of recent pain intensity. Probable variables are the different ways in which doctors and nurses manage their patients' pain, rather than more detailed clinical factors, because 90% of cancer pain can be managed (Schug, Zech, & Dorr, 1990). In addition, the cause of the pain was not a significant factor in any analysis. However, a direct measure of underprescribing or related indicators of inadequate pain management is lacking to quantify their role as determinants of patients' pain. The possibility also exists that patients' self-reports of taking medication prescribed by their primary care doctor or nurse practitioner are exaggerated, thereby obscuring the relationship between patients' analgesic use and their pain. The near-zero correlation between the two measures suggests that it would require considerable misreporting to mask an important association.

Limitations

Several limitations exist relative to the interpretation and generalizability of these results. First, the measures on patients' willingness to report pain and take prescribed medication are self-reports based on a long recall period, although an internal consistency estimate exists on the latter measure. Du Pen et al. (2000) also provided some validation. Using medication prescriptions and orders, Du Pen et al. determined that patients in their study adhered to pain treatment regimens at approximately 75% of the assessment points, in rough agreement with this study's data (i.e., 78% indicated they took prescribed analgesics always or frequently during the past year). Also, the correlation analysis of patients' willingness to report pain and take prescribed medication with patients' beliefs is consistent with previous findings (Du Pen et al.; Ward & Gatwood, 1994). The lack of predictive effect for beliefs on recent pain does not depend on the validity of these measures. Second, the moderate rates of opioid use and prescriptions in this sample restrict the ability to investigate the potentially indirect barriers posed by patients' beliefs through their impact on willingness to take opioids if prescribed by their doctor or nurse practitioner. In addition, the cross-sectional nature of the baseline data limits the conclusions that can be drawn regarding the process by which patients' beliefs about pain and its treatment evolve as a consequence of the pain, pain management, and degree to which they are shaped by personal values. In particular, the stability of patients' beliefs over time and how they evolve with changes in pain were not possible to assess. Also, these findings are based on a largely Caucasian sample in the northeastern United States and may not generalize to other cultures or contexts with greater ethnic diversity.

These findings support the assertion that beliefs of patients with cancer are not currently an important barrier to effective pain management in the primary care setting. Rather, providers' pain management practices are more likely determinative of the level of pain relief achieved and the beliefs patients come to hold based on their personal experiences. Moreover, even though approximately half of the sample, which included actively treated patients and closely followed survivors, had pain that was not cancer related, the results did not depend on cause of pain.

Implications

Nursing Practice

Nurses with knowledge of pain management, such as oncology nurses, can exert influence on the quality of pain management in primary care either as providers or as consultants to colleagues in this setting. Specific nursing implications can be identified in three areas: assessing patients' beliefs, improving the quality of pain management through timely reassessment, and ensuring continuity of care.

Assessment of patients' beliefs is important because of the potential role of beliefs as indicators of ineffective pain management. Patients who received medication or treatment for pain but did not experience relief were more likely to agree with the belief that "pain medication cannot control pain." Although beliefs did not seem to be a barrier in this study, providers can unintentionally introduce, reinforce, or confirm inaccurate beliefs. Nurses can alert colleagues to inaccurate beliefs so that patients will receive a consistent message from all providers regarding the importance of reporting and treating pain. In addition, when opioids are prescribed, patients' beliefs should be assessed to identify and prevent any potential barriers to use through appropriate education and reinforcement of positive beliefs about opioids. This approach builds on the willingness expressed by many patients to take opioids if prescribed with proper instruction about addiction and guards against patients' concerns that were related negatively to their willingness to take these medications (if prescribed). Researchers have suggested that a structured approach to teaching patients about pain and its treatment can improve some aspects of pain management, including relief and adherence to pain medications (Allard, Maunsell, Labbe, & Dorval, 2001; West et al., 2003; Wilkie, Williams, Grevstad, & Mekwa, 1995).

The current study found that patients' beliefs may be an effect of less-than-optimal pain treatment, suggesting that nursing efforts to improve the quality of pain management are essential. In particular, after the initial assessment and treatment of outpatients, establishing plans for timely pain reassessment by telephone or visit to evaluate progress toward sustained pain relief is imperative. The timeline for

reassessment should be appropriate to the severity of pain and treatment plan.

With regard to ensuring continuity of care, these study data suggest that primary care providers often are involved in managing pain in patients with cancer. Of those treated for pain by a specialist or primary care provider, 42% received pain prescriptions from the primary care provider. Thus, collaboration and effective written and oral communication are vital when pain treatment plans are developed by oncology or other specialists but may be continued by primary care clinicians. For example, discharge summaries should include sufficient detail on pain assessment and treatment, as well as those therapies that did not work. Similarly, primary care professionals can promote continuity of care by alerting their colleagues who are on call that a patient is being titrated on analgesics or is on a complex analgesic regimen that may require adjustment. Oncology nurses can contribute to the development of documentation and communication that facilitates continuity of pain management within and across settings.

Nursing Research

In recognition of the challenges created by the decentralization of cancer care, interventions are needed that will help oncology nurses best direct their efforts toward ensuring that pain is well managed across the continuum of care. Evaluation should focus, particularly, on whether assessing patients' beliefs about pain and its treatment, in conjunction with pain assessment, has had a positive impact on patients' pain-related

behaviors and pain relief. Oncology nurses can serve to educate patients to strengthen beliefs that are based on accurate information, enabling patients to assert themselves when interacting with less knowledgeable providers. The impact of these efforts deserves to be studied and should include nurses who work in specialized cancer settings because, with their colleagues, they often manage patients in managed services, primary care, and other settings. Also, cause of pain should be considered explicitly as an important clinical factor, especially in cancer populations with higher rates of opioid use and prescriptions.

Previous researchers have suggested that interventions need to focus on providers' appropriate use of opioids. Nevertheless, a patient-oriented focus still is required. Patients and their families need to know what to expect and must have their concerns addressed. In particular, interventions should try to build on patients' willingness to take an opioid when advised that the opioid would not be addicting if used according to instructions. Moreover, failing to heed the potentially greater influence of patient concerns, as providers are more willing to prescribe opioids, could undermine efforts toward improving the treatment of pain in patients with cancer.

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