

# The Effects of Mastery on Pain and Fatigue Resolution

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**T**he psychological resource of mastery is the personal control felt over occurrences that are perceived to have an important effect on one's life (Pearlin & Pioli, 2003). Mastery can be global (i.e., generalized to multiple areas of life) or domain specific (Pearlin & Pioli), such as cancer-related (Kurtz, Kurtz, Given, & Given, 2008) or caregiver-related mastery (Sherwood et al., 2007). Mastery level may change over time in response to life events (Avison & Cairney, 2003; Cairney & Krause, 2008). Personal control is the belief that an individual has the ability and resources to control or influence outcomes (Carver et al., 2000; Seeman, 1999). Personal control affects patients' healthcare decisions by increasing confidence in decision making and modifying the prioritization of outcomes (Carver et al.; Volker, Kahn, & Penticuff, 2004a, 2004b).

Outcomes from symptom management interventions may be influenced by the patient's environment, their health and illness, and personal characteristics, such as psychological attributes (Dodd et al., 2001). Although psychological issues (e.g., depression, anxiety) are assessed frequently in symptom-related research, psychological resources (personality characteristics influencing patient behaviors that are used to confront and address stressors) (Pearlin & Schooler, 1978; Pudrovska, Schie-man, Pearlin, & Nguyen, 2005) are considered less often. Cancer-related disease processes, symptoms, and side effects of treatments can act as stressors; therefore, mastery may have an effect on patients' behavioral responses to stressors, such as cancer-related symptoms.

McLeod (2003) stated that "mastery's presumed link to choice, decision, and action has been one of its most compelling contributions to literature on stress" (p. 176). Mastery may influence the use of interventions, including new models, if another is ineffective (Arnold et al., 2006; Ross & Sastry, 1999). Therefore, mastery may play an important role in symptom management outcomes. As a result, the current study sought to examine the effects of mastery on the resolution of pain and fatigue in individuals with cancer who received a six-contact, eight-week cognitive behavioral intervention after adjusting for age, sex, education, income, race, depression, and comorbidities.

**Purpose/Objectives:** To determine whether mastery, the personal control felt over occurrences perceived to have an important effect on one's life, influences the resolution of pain and fatigue severity.

**Design:** Secondary data analysis of two randomized clinical trials.

**Setting:** Accrual from two comprehensive cancer centers, one community oncology program, and six hospital-affiliated ambulatory oncology centers.

**Sample:** 330 patients with solid tumors who were undergoing chemotherapy and receiving a nurse-presented, six-contact, eight-week intervention for symptom management.

**Methods:** Analysis included baseline and interventional data. Logistic regression and survival analysis methods were used to explain relationships between mastery and time to resolution and resolution of pain and fatigue severity.

**Main Research Variables:** Mastery, pain and fatigue severity resolution, and time to resolution.

**Findings:** No significant differences in mastery were found among key socioeconomic and cancer-related variables. Mastery was a significant predictor of pain resolution status but did not significantly decrease time to resolution. Mastery did not have a significant effect on fatigue resolution status or time to fatigue resolution after adjusting for other covariates.

**Conclusions:** Mastery was symptom specific, predicting pain resolution but not fatigue. Cancer may have an equalizing effect on mastery early in diagnosis and treatment.

**Implications for Nursing:** Nurses should develop interventions that increase mastery in patients with cancer, which may lead to improved resolution of pain. Additional research is needed to explore how mastery may affect resolution of pain severity and other symptoms experienced by people with cancer.

## Literature Review

An extensive literature search revealed one study that examined relationships between mastery and pain and fatigue severity: Kurtz et al. (2008) noted that levels of mastery predicted lower pain and fatigue severity scores after adjusting for the effects of other covariates in patients with cancer. However, Kurtz et al. (2008) did not examine the resolution of pain or fatigue severity.

No other research known to the authors has addressed the effect of mastery on pain and fatigue resolution. However, mastery can be conceptually linked to cognitive-behavioral interventions (CBIs) and patient-related barriers to symptom management via the need for control and, therefore, motivation to resolve pain and fatigue. The conceptual links among mastery, CBIs, and symptom management barriers support the need to examine the effect of mastery on pain and fatigue resolution.

### Cognitive-Behavioral Interventions

Mastery and CBIs can both be linked to the process of situation appraisal. CBIs frequently are used in research regarding cancer symptom management and may include education on symptoms and training regarding self-care behaviors to enhance problem solving as well as emotional and social support to patients and their caregivers (Antoni et al., 2001; Dodd & Miaskowski, 2000; Given et al., 2002, 2004; Quesnel, Savard, Simard, Ivers, & Morin, 2003). Cognitive behavioral theory, from which CBIs are derived, maintains that the manner in which patients appraise a situation affects their behavioral response to and beliefs regarding their ability to control a situation (Dobson & Dozois, 2001; Sherwood et al., 2005).

Patients can alter their appraisals of a situation and experiment with and identify strategies that may lead to more effective control of the situation (Dobson & Dozois, 2001; Sherwood et al., 2005). People with higher levels of mastery perceive themselves as having more control; therefore, they may appraise a situation as more governable than those with lower levels (Pearlin & Pioli, 2003; Pearlin & Schooler, 1978) and may exhibit behaviors of higher CBI use and its benefits. Because CBIs have been shown to decrease symptom severity and mastery level

may influence CBI use and benefits, mastery level may indirectly influence pain and fatigue resolution.

### Symptom Management Barriers

A patient's perception of having minimal control over symptoms may act as a barrier to the management of pain and fatigue (American Pain Society, 2005; National Cancer Institute [NCI], 2006). Beliefs that symptoms are inevitable and untreatable may dissuade a patient from participating in symptom management (American Pain Society; NCI). Barriers to pain and fatigue management are critically important to address because these elements are prevalent in patients with cancer and can have profound effects on physical and social functioning, health status, and psychological well-being (Doorenbos, Given, Given, & Verbitsky, 2006; Given et al., 2002; Mystakidou et al., 2006; Reyes-Gibby, Aday, Anderson, Mendoza, & Cleeland, 2006). Mastery may influence patients' beliefs regarding the controllability of pain and fatigue and, therefore, symptom management barriers. Mastery also may influence patients' perceptions of the controllability of pain and fatigue and participation in their management, which may affect the resolution of their severity.

### Theoretical Framework

The literature review suggested that relationships exist between mastery level and the resolution of pain and fatigue severity. The Symptom Management Model (SMM) (Dodd et al., 2001) was selected to guide the examination of mastery's influence on pain and fatigue resolution. Within the SMM, the dimensions of symptom experience, symptom management strategies, and outcomes are inter-related to each other and are affected by

**Table 1. Symptom Management Model Concepts With Study Variables**

Variable	Dodd et al.'s (2007) Concepts	Present Study's Variables
Symptom experience	The patient's perception and evaluation of and response to a symptom	Onset time of pain and fatigue severity Pain and fatigue interference
Symptom management strategies	Comprised of the assessment of symptoms and identification of symptom management strategies	Proportion of pain and fatigue interventions tried
Outcomes	The results of symptom management strategies, including functional, emotional, and symptom status; self care; mortality; costs; quality of life; morbidity; and comorbidity	Time to resolution: conceptualized as the interval between symptom management strategies and outcomes Resolution of pain and fatigue severity
Person	Is "intrinsic to the way an individual views and responds to the symptom experience" (p. 670)	Age, race, education level, gender, and income Mastery
Environment	"The aggregate of conditions or context within which the symptom occurs" (p. 671)	Not included in this analysis
Health and illness	"Variables unique to the health or illness state of an individual and include risk factors, injuries, or disabilities" (p. 670)	Cancer site, depression, comorbidities, presence of metastasis, and recurrence of cancer

the domains of person, environment, health, and illness. Relationships between SMM dimensions and domains and variables in this analysis are described in Table 1. As the variable of interest in this analysis, mastery is viewed as a property of person. Dodd et al. noted that person variables are “intrinsic to the way an individual views and responds to the symptom experience” (p. 670). Therefore, mastery is viewed as a property of person that influences patient responses to pain and fatigue severity, such as participation in pain and fatigue management interventions with outcomes of pain and fatigue severity resolution.

## Methods

The current research was a secondary analysis of data from two large, randomized clinical trials that tested the effect of a CBI on the symptom management of patients undergoing chemotherapy. Eligibility criteria for both studies included being aged 21 years or older, cognitively intact, undergoing chemotherapy for a diagnosis of a solid tumor (e.g., breast, colon, lung) or non-Hodgkin lymphoma, and able to speak and hear English as well as having access to a touchtone telephone. Progression through both trials is depicted in Figure 1.

In one trial, patients and a family caregiver received a six-contact, eight-week nurse-presented symptom management CBI or a six-contact, eight-week educational and informational intervention presented by a non-nurse social worker. In the second trial, patients without a caregiver received either the identical nurse-presented CBI or a six-contact, eight-week time period interactive automated voice response system. Examples of the provided management intervention strategies are shown in Table 2. All participants in both trials received the Symptom Management Guide—a manual that includes self-care strategies to manage symptoms frequently experienced by patients receiving treatment for cancer.

For both trials, data were gathered at baseline over the six contacts and at 10 and 16 weeks. For the current analysis, data were limited to the nurse arms of both trials (N = 333) and included data from baseline and the six contacts over eight weeks.

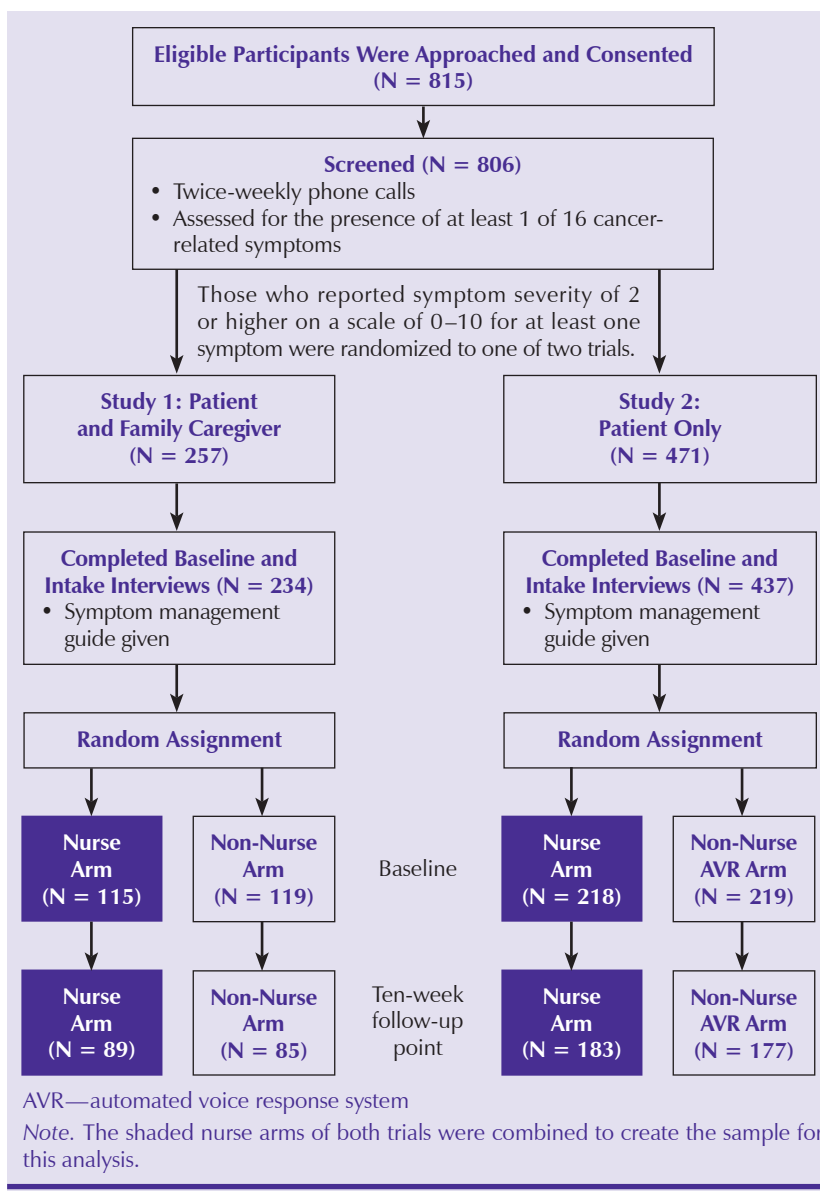
## Procedures

The institutional review board from each participating university and clinical site (two comprehensive cancer centers, one

community cancer oncology program, and six hospital-affiliated community oncology centers) approved the informed consent and standards for the protection of participants. All data for this secondary analysis had identifiers removed.

## Measures

**Mastery:** Mastery was measured with a variation of the mastery scale (Pearlin & Schooler, 1978) reworded to focus on control over cancer care rather than life in general (see Figure 2). Each of seven items was rated on a five-point Likert scale with reliability using a Cronbach alpha of 0.71. Item scores then were summed to create a total score range of 0–35, with a higher score indicating greater or better mastery. Summed baseline mastery level was used for this analysis and entered as a continuous variable.



**Figure 1. Flow Chart Showing Participant Progression Through Stages of Trials**

**Table 2. Intervention Strategies for Pain or Fatigue**

Nurse Behavior	Definition	Pain Intervention Strategies	Fatigue Intervention Strategies
Counsel and support	Nurse facilitates patient self-awareness or self-esteem and elicits values or problem resolution.	Encourage patient to verbalize how pain has affected his or her emotions. Encourage patient to verbalize how he or she wants pain managed and help patient communicate this to healthcare provider (HCP).	Encourage the patient to verbalize how fatigue has altered his or her lifestyle. Encourage patient to ask for assistance of others.
Communication with provider	Nurse asks patient to consider and plan for what to report and ask of HCP.	Tell HCP if pain interferes with sleep. Tell HCP if pain interferes with performance of activities of daily living.	Inform HCP if unable to think clearly. Inform HCP of amount and patterns of fatigue.
Prescribe	Nurse formally requests for alterations in behaviors.	Take pain medication as prescribed around the clock. Keep track of pain levels with a pain diary.	Eat calorie- and protein-dense foods. Engage in low-impact exercise daily.
Teach	Nurse uses various means to transfer information leading to patient knowledge.	Pain medication side effects, use of medications, effectiveness Use of cold therapy and heat therapy	Modification of activities and rest patterns Sleep hygiene (routine bedtime, comfortable sleep environment)

**Onset time of pain and fatigue severity:** Severity for each symptom was a single-item measure on a scale of 0 (symptom not present) to 10 (worst possible symptom). Measures of pain and fatigue severity from the intervention contacts were used to create separate onset time variables. The onset time variables allowed the researchers to determine at which of the six contacts the patient first experienced pain or fatigue severity of 4 or higher. Because patients were aggregated at onset time at the first contact versus the second or later contact, the variables were dichotomized with “0” for patients who experienced symptom severity of 4 or higher at the first contact and “1” for patients who reported a severity of 4 or higher at the second or later contact.

**Time to pain and fatigue severity resolution:** Pain and fatigue severity resolution were both defined as the patient having experienced pain or fatigue severity of 4 or higher during intervention contacts 1–5, which then fell and remained below 4 by the end of the intervention. Patients who had pain or fatigue severity of 4 or higher during contacts 1–5 and remained above 4 at the last contact were defined as “not resolved.” The separate pain and fatigue severity resolution variables were dichotomized, with “0” used for not resolved and “1” used for resolved.

Time to pain and fatigue severity resolution were both defined as the interval in days between the contact in which the symptom rose to a severity of 4 or higher and the contact in which it fell and remained below 4 for the duration of the intervention. If severity remained at 4 or higher, it was considered “not resolved.” If the patient did not resolve the symptom, time to resolution was censored and defined from the first contact day in which severity reached 4 or higher to the last contact day. Patients whose symptom severity never reached 4 or who reached 4 or higher at the last contact and could not be followed up

were excluded. The separate time to resolution variables were entered as continuous variables.

**Pain and fatigue interference:** Pain and fatigue interference were gauged separately with a summed measure of four items that included interference with enjoyment of life, activities, relationships, and emotions resulting from pain or fatigue. Given et al. (2008) developed the summed interference scale with factor analysis. Interference was not assessed unless the patient reported pain or fatigue severity of 1 or higher. Each interference item was rated on a scale of 0 (no interference) to 10 (worst interference possible). The symptom-based score at onset time from the intervention data was used in this model. The total possible score could range from 0–40, with a higher value signifying greater interference. Interference was entered as a continuous variable.

**Proportion of pain and fatigue interventions tried:** At each of the six contacts, each patient was asked to rate his or her pain and fatigue severity on a scale of 0–10. If the pain or fatigue severity was 4 or higher, interventions were provided or delivered to patients. Patients in the nurse-administered arms of the two trials received up to

- I am usually certain about what to do in relation to my cancer care.
- No matter what I do, it never seems to be enough for the care of my cancer.
- In general, I am able to handle most problems in my cancer care.
- I am not doing as well as I would like with my cancer care.
- I feel I have a great deal of influence over the things that happen in my cancer care.
- I believe I am mastering most of the challenges in my cancer care.
- I have lost some control of my life since my illness.

**Figure 2. Cancer Mastery Scale Items**



four interventions. At the next contact, the patient was asked if he or she had tried the interventions. The total number of interventions tried was divided by the total number administered at all contacts for each participant. The separate pain and fatigue proportions were then dichotomized at the median for each symptom (pain = 0.58; fatigue = 0.72) with "0" as a low proportion and "1" as a high proportion of interventions tried.

**Comorbidities:** The total number of comorbidities was assessed at baseline with a modified version of the **Comorbidity Questionnaire** (Katz, Chang, Sangha, Fossel, & Bates, 1996). Patients were asked if a healthcare professional had ever told them they had certain diseases, such as diabetes, chronic bronchitis, emphysema, or heart problems. The questionnaire assessed a total of 13 different comorbidities, with summed scoring of 0–13 possible. Comorbidity was entered as a continuous variable.

**Depression:** Depression was assessed at baseline with the **Center for Epidemiologic Studies–Depression** scale (Radloff, 1977). The 20-item measure assessed each item on a four-point Likert scale ranging from 0 (never) to 3 (most of the time). The responses were summed, with a score of 16 or higher indicating that the patient is at risk for clinical depression. Depression was entered as a continuous variable.

**Other variables:** Other variables for this analysis obtained from interview and patient records, including age, sex, race, education, income, cancer site, presence of metastasis, and recurrence of cancer. Because of a lack of diversity in the sample, race was dichotomized into Caucasian ("0") and other ("1"). Age was categorized so age group effects could be examined.

## Data Analysis

SPSS® 14 was used for statistical analysis. The level of significance for all statistical procedures was set at  $p < 0.05$ . Descriptive analysis examined relationships among variables and characterized participants. Logistic regression models determined predictors of resolution versus nonresolution of pain and fatigue severity. Variables were entered simultaneously for each model. Nonsignificant variables were removed one at a time, then models were rerun to achieve the most parsimonious model with goodness of fit. Collinearity diagnostics suggested no multicollinearity among variables. In addition, Cox proportional hazards and Kaplan-Meier survival analysis models assessed time to resolution.

## Results

### Sample

The analysis was completed on 330 patients, as three patients did not have documented baseline levels of mastery. Table 3 depicts demographic characteristics. Patients were aged 25–90 years ( $\bar{X}$  age = 57; SD = 11). Women

comprised 69% of the sample. The sample was mostly Caucasian (86%) and educated, with 92% achieving a minimum of a high school degree. The most common site of cancer was the breast (35%), and 61% of the sample had metastatic cancer. The mean mastery of the sample was 25.76 (SD = 4; median = 26).

**Table 3. Mean Baseline Mastery Level by Demographic Variables**

Variable	n	%	$\bar{X}$ Mastery	SD
<b>Gender</b>				
Male	102	31	26	4.1
Female	228	69	25.64	3.97
<b>Age (years)</b>				
50 or less	93	28	25.78	4.05
51–60	103	31	25.93	4.09
61–70	86	26	26.06	3.6
71 or higher	48	15	24.79	4.39
<b>Race</b>				
Caucasian	283	86	25.81	3.91
Non-Caucasian	44	13	25.48	4.49
Missing	3	1	25	6.56
<b>Education level</b>				
Less than high school	27	8	26.07	3.54
High school	80	24	25.48	4.18
Some college or technical school	101	31	25.75	4.06
College	68	21	25.79	3.7
Graduate degree	54	16	25.98	4.33
<b>Annual household income (\$)</b>				
Less than 24,999	43	13	25.02	4.25
25,000–49,999	92	28	25.71	3.68
50,000–74,999	75	23	25.89	3.92
75,000–99,999	31	9	26.38	4.01
100,000 or higher	57	17	26.07	4.29
Missing	32	10	25.41	4.34
<b>Cancer site</b>				
Breast	117	35	25.74	3.76
Colon	39	12	26.28	4.11
Lung	70	21	26.54	4.21
Other	104	32	25.65	4.13
<b>Recurrence of cancer</b>				
Yes	73	22	25.12	3.57
No	257	78	25.93	4.11
<b>Metastatic cancer</b>				
Yes	201	61	25.47	3.95
No	129	39	26.2	4.07
<b>Proportion of pain interventions tried</b>				
Low	73	22	25.27	4.07
High	75	23	25.16	4.15
<b>Proportion of fatigue interventions tried</b>				
Low	124	38	25.44	3.78
High	125	38	25.56	3.89
<b>Onset of pain</b>				
First contact	71	22	25.06	3.96
Later contact	40	12	26.05	3.64
<b>Onset of fatigue</b>				
First contact	159	48	25.38	3.91
Later contact	53	16	26.7	3.14

N = 330

**Table 4. Logistic Regression Models: Resolution of Pain and Fatigue Severity**

Variable	$\beta$	SE	OR	95% CI	p
<b>Pain</b>					
Mastery	0.16	0.07	1.17	1.02–1.34	0.03
<b>Age (years)</b>					
≤ 50	–1.8	0.78	0.17	0.04–0.77	0.02
51–60	–0.64	0.86	0.53	0.1–2.83	0.46
61–70	–0.86	0.91	0.43	0.07–2.5	0.34
≥ 71	Reference	–	–	–	–
<b>Proportion of pain interventions tried</b>					
High	2.03	0.51	7.65	2.79–20.93	< 0.01
Low	Reference	–	–	–	–
<b>Fatigue</b>					
Mastery	0.06	0.05	1.06	0.97–1.16	0.2
Comorbidities	–0.35	0.12	0.71	0.56–0.89	< 0.01
<b>Proportion of fatigue interventions tried</b>					
High	1.95	0.34	7.05	3.62–13.72	< 0.01
Low	Reference	–	–	–	–
<b>Onset of fatigue severity</b>					
Later contact	0.97	0.39	2.63	1.22–5.65	0.01
First contact	Reference	–	–	–	–

CI—confidence interval; OR—odds ratio; SE—standard error

Note. Pain = Hosmer and Lemeshow Test (chi-square = 8.23; df = 8; p = 0.411); fatigue = Hosmer and Lemeshow Test (chi-square = 8.23; df = 8; p = 0.411)

Note. The Hosmer and Lemeshow Test significance value (> 0.05) implies that the model's estimates fit the data at an acceptable level.

Attrition analysis revealed that 60 patients did not take the 10-week interview. No significant difference in mastery was found with a t-test method between the attrition group and the nonattrition group ( $t = 1.66$ ;  $df = 328$ ;  $p = 0.1$ ). In addition, no significant differences in mastery were observed among key socioeconomic variables and other categorical study variables except for onset of fatigue severity.

### Pain and Fatigue Severity Resolution

Within the pain severity resolution model, mastery and proportion of pain interventions tried significantly predicted pain severity resolution status after adjusting for other covariates (see Table 4). Model results revealed that as mastery increased, the odds of pain severity resolution taking place also increased. Patients who had tried a high proportion of pain interventions were more likely to achieve pain severity resolution versus patients who had tried a low proportion. Age approached significance, and a significant difference was noted between the youngest and oldest age group in the prediction of pain severity resolution after adjusting for other covariates. Patients aged 50 years or younger also were less likely to achieve pain severity resolution than those aged 71 years or older.

Mastery did not significantly predict fatigue resolution status but was left in the model, being the variable of interest for this analysis. The fatigue severity resolution model of comorbidities, proportion of fatigue interventions tried, and onset time of fatigue severity were significant predictors of fatigue severity resolution status after adjusting for other covariates. As the number of comorbidities increased, the odds of fatigue severity resolving decreased. Patients who had tried a high proportion of fatigue interventions and an onset time of fatigue severity at a later contact were more likely to achieve resolution of fatigue severity versus those who tried a low proportion of fatigue interventions and had an onset time at first contact.

### Time to Pain and Fatigue Severity Resolution

Kaplan-Meier models were used to determine the unadjusted mean number of days to resolution of pain and fatigue severity among categorical variables (see Table 5). Cox proportional hazards models then were used to analyze relationships between time to resolution and categorical and continuous explanatory variables and resolution of pain and fatigue severity (see Table 6). Mastery, comorbidities, proportion of pain and fatigue interventions tried, and onset time of pain and fatigue severity were entered in the models because they were significant covariates in the logistic regression models.

**Pain:** Patients who had tried a higher proportion of pain interventions required, on average, nine fewer days to resolve pain severity versus those who had tried a low proportion. Patients who experienced onset time at the second or later contact required, on average,

**Table 5. Mean Time to Pain and Fatigue Resolution**

Variable	Unadjusted $\bar{X}$ Time (Days) to Resolution
<b>Proportion of pain interventions tried</b>	
High	40.76
Low	49.7
<b>Onset of pain severity</b>	
Later contact	31.72
First contact	49.49
<b>Proportion of fatigue interventions tried</b>	
High	45.78
Low	53.6
<b>Onset of fatigue severity</b>	
Later contact	34.7
First contact	51.62

**Table 6. Cox Proportional Survival Regression Model: Time to Resolution**

Variable	$\beta$	SE	HR	95% CI	p
<b>Pain</b>					
Mastery	0.04	0.03	1.04	0.98–1.1	0.25
<b>Proportion of pain interventions tried</b>					
High (1)	0.93	0.28	2.52	1.44–4.4	< 0.01
Low (0)	Reference	–	–	–	–
<b>Onset of pain severity</b>					
Later contact (1)	2.19	0.35	8.95	4.5–17.8	< 0.01
First contact (0)	Reference	–	–	–	–
<b>Fatigue</b>					
Mastery	0.02	0.03	1.02	0.97–1.08	0.39
Comorbidity	–0.22	0.09	0.8	0.68–0.95	0.01
<b>Proportion of fatigue interventions tried</b>					
High (1)	1.02	0.22	2.78	1.8–4.3	< 0.01
Low (0)	Reference	–	–	–	–
<b>Onset of fatigue severity</b>					
Later contact (1)	2.91	0.37	18.29	8.93–7.47	< 0.01
First contact (0)	Reference	–	–	–	–

CI—confidence interval; HR—hazard ratio; SE—standard error

Note. Pain model: chi-square = 67.13,  $p < 0.01$ ; fatigue model: chi-square = 144.23,  $p < 0.01$

18 fewer days to resolve pain severity versus those with onset time at the first contact. Mastery did not have a significant effect on time to pain severity resolution. Proportion of pain interventions tried and onset time of pain severity were both significantly associated with time to pain severity resolution, after adjusting for other covariates.

**Fatigue:** Patients who had tried a higher proportion of fatigue interventions required, on average, nine fewer days to resolve fatigue severity versus those who had tried a low proportion of fatigue interventions. Patients who experienced onset time of fatigue severity at the second or later contact required, on average, 17 fewer days to resolve fatigue severity versus those with onset time at the first contact.

Mastery did not have a significant effect on time to fatigue resolution. Comorbidities and proportion of fatigue interventions tried and onset time of fatigue severity were significantly associated with time to fatigue severity resolution after adjusting for other covariates. As the number of comorbidities increased, time to resolution of fatigue severity also increased.

## Discussion

The findings from this analysis suggest that mastery predicted pain severity resolution status after controlling for other variables. Mastery was not a significant predictor of fatigue severity resolution, nor did mastery have a significant effect on time to the resolution of pain

or fatigue severity. The conceptualization of mastery may have an influence on patient participation in symptom management interventions. A lower proportion of pain and fatigue interventions tried negatively influenced symptom resolution and time to resolution. However, no difference was found in the level of mastery between the high and low proportion of interventions tried groups, which questions mastery's role in the action of intervention use leading to symptom resolution. Mastery may affect pain resolution through an alternate path; therefore, additional research would be beneficial in examining alternative explanations for mastery's effect on pain resolution.

The symptom-specific results of mastery predicting the resolution of pain severity may be explained by patient responses to pain. Cancer pain is highly distressing to patients (American Pain Society, 2005; Fallon, 2005), and issues of personal control over pain are of the utmost importance to patients with cancer (Volker et al., 2004b).

Because mastery has an effect on stress and coping mechanisms (Pearlin, Menaghan, Lieberman, & Mullan, 1981; Pearlin & Schooler, 1978), mastery may be more selective toward symptoms (e.g., pain) that may be perceived as more distressing.

In addition, no differences in mastery level were observed between groups among key socioeconomic and disease-related variables. Baseline mastery level was used for this analysis. The results suggest that early in treatment, patients with cancer who are receiving chemotherapy may experience similar levels of mastery and that the diagnosis of cancer and its treatment is an equalizer. Additional research is needed to examine whether this similarity continues or group-specific differences in changes of mastery occur over time.

The mastery measure used in this analysis was specific to mastery over cancer. Mastery has been noted to be conceptually flexible and may comprise global as well as domain-specific perceived personal control (Pearlin & Pioli, 2003). Domain-specific measures of mastery have been developed and used in previous research (Kurtz, Kurtz, Stommel, Given, & Given, 2001; Sherwood et al., 2007), although connections between global and domain-specific mastery are not well understood (Pearlin & Pioli). Therefore, additional research is needed to determine whether measures of domain-specific mastery truly capture the influence that mastery may have on behaviors and well-being.

Finally, although statistically significant results were found in this analysis, whether the results are clinically significant is unclear. The results of this analysis may

provide the foundation for future investigations seeking to address clinical significance while determining the specific effect of mastery on pain resolution as well as mastery's effect on other symptoms.

## Nursing Implications

Results from this analysis have implications for nursing practice. Clinicians should increase efforts to closely assess for and manage pain and fatigue, particularly in the beginning of treatment, because pain and fatigue that present early take longer to resolve. Clinicians should take steps to increase the number of pain and fatigue interventions tried by patients to decrease time to symptom resolution.

Results from this analysis suggest that mastery predicts pain severity resolution. Therefore, clinicians should design and implement pain management interventions that enhance mastery by increasing perceptions of personal control. Interventions that may improve perceptions of personal control and mastery include the provision of information, support of patient choices, and facilitation through the healthcare system (Volker et al., 2004a).

## Limitations

The ability to generalize the current study's findings to a larger population of patients with cancer undergoing therapy may be affected by the fact that minorities were under-represented (only 14% of the sample were non-Caucasian). Secondly, the effects of mastery on symptom resolution may differ according to symptoms and interventions provided because specific

interventions may be more motivating for one person than for another. In addition, this analysis focused on the resolution of pain and fatigue, so the ability to generalize to other symptoms may be limited.

## Conclusion

Limited research exists regarding the influence of psychological resources such as mastery on symptom management for patients with cancer undergoing chemotherapy. Additional research that further examines mastery and its effect on symptom management may assist researchers in better understanding the effectiveness of symptom management interventions and in tailoring interventions to meet the needs of patients with cancer.

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