Organizational influences on patient perceptions of symptom management

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Abstract:

We tested a theoretical model of the relationships of hospital context, nursing unit structure, and patient characteristics to patients' perceptions of the extent to which nurses met their expectations for management of troubling symptoms. In our sample of 2,720 patients randomly selected from 278 nursing units in 143 hospitals, we found that patient age was positively associated with patients' perceptions of symptom management. The proportion of registered nurses as caregivers on the unit was not a significant predictor of symptom management, but better work conditions on the unit (nurses' autonomy, participation in decision-making, and collaboration with other disciplines [relational coordination]) significantly contributed to patients' perceptions of better symptom management.

Keywords: hospital/institutional environment | organizational structure | symptom management

Article:

The 2001 Institute of Medicine report, Crossing the Quality Chasm, identified pervasive problems with health-care quality in the United States and emphasized the need for improvements incorporating patients' evaluations of their illness experiences and encounters with the health-care system (Committee on Quality of Health Care in America, 2001). Although numerous factors influence patients' evaluation of their care, meeting expectations for symptom relief has been identified as a strong predictor of patient satisfaction (Jackson, Chamberlin, & Kroenke, 2001; Kroenke, Stump, Clark, Callahan, & McDonald, 1999).

Patients are especially vulnerable to distressing symptoms during hospitalization, with pain, lack of energy, and sleep disturbances identified most frequently (Kris & Dodd, 2004; Kroenke et al., 1999; Tranmer et al., 2003). There is evidence that these symptoms (pain, in particular) are poorly controlled during hospitalization (Kris & Dodd; Toscani, Di Giulio, Brunelli, Miccinesi, & Laquintana, 2005). Other researchers have found modest but statistically significant

differences in symptom management across both hospitals and nursing units, unexplained by patient characteristics (Brown, Sandoval, Murray, & Boissonnault, 2008; Desbiens et al., 1996). These findings suggest that organizational characteristics may influence the extent to which patient symptoms are perceived as effectively managed during hospitalization.

Although hospital nurses play a key role in monitoring symptoms and acting to ensure that they are resolved, their contributions to the management of patients' symptoms during hospitalization are not well understood. A substantial body of research has been focused on nurses' roles in symptom management with cancer patients, but research addressing this topic in general medical–surgical patient populations is limited. Most of these researchers have emphasized compliance with the Joint Commission standards for pain assessment and management (Kris &Dodd, 2004; Toscani et al., 2005). Moreover, despite emerging findings that attributes of nurses' work environment contribute to better patient outcomes (Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Friese, Lake, Aiken, Silber, & Sochalski, 2008), work setting factors that foster effective symptom management are not well understood. Therefore, we examined the relationships of contextual and structural attributes of medical, surgical, and medical–surgical nursing units and patient characteristics to patients' evaluation of the extent to which nurses met their expectations for symptom management.

THEORETICAL FRAMEWORK

We used Structural Contingency Theory (SCT) as our theoretical model (see Fig. 1). The fundamental principle of SCT is that organizations will be most effective when their structural features best fit the demands of their external and internal environments (W. R. Scott, 2003). In SCT, structure is defined as the administrative mechanisms used to balance coordination and control of work. Decisions about organizational structure must consider both the environment in which the organization operates and the tasks it performs, referred to collectively as organizational context. In SCT, there is no single best way to structure the work in an organization. However, different approaches to organizational structure may not be equally effective. There are multiple definitions of organizational effectiveness in SCT. We conceptualized it as the degree to which nurses met patients' expectations for symptom management during hospitalization. In the discussion that follows, we outline the major constructs of SCT and provide literature support for the variables used to measure these constructs.

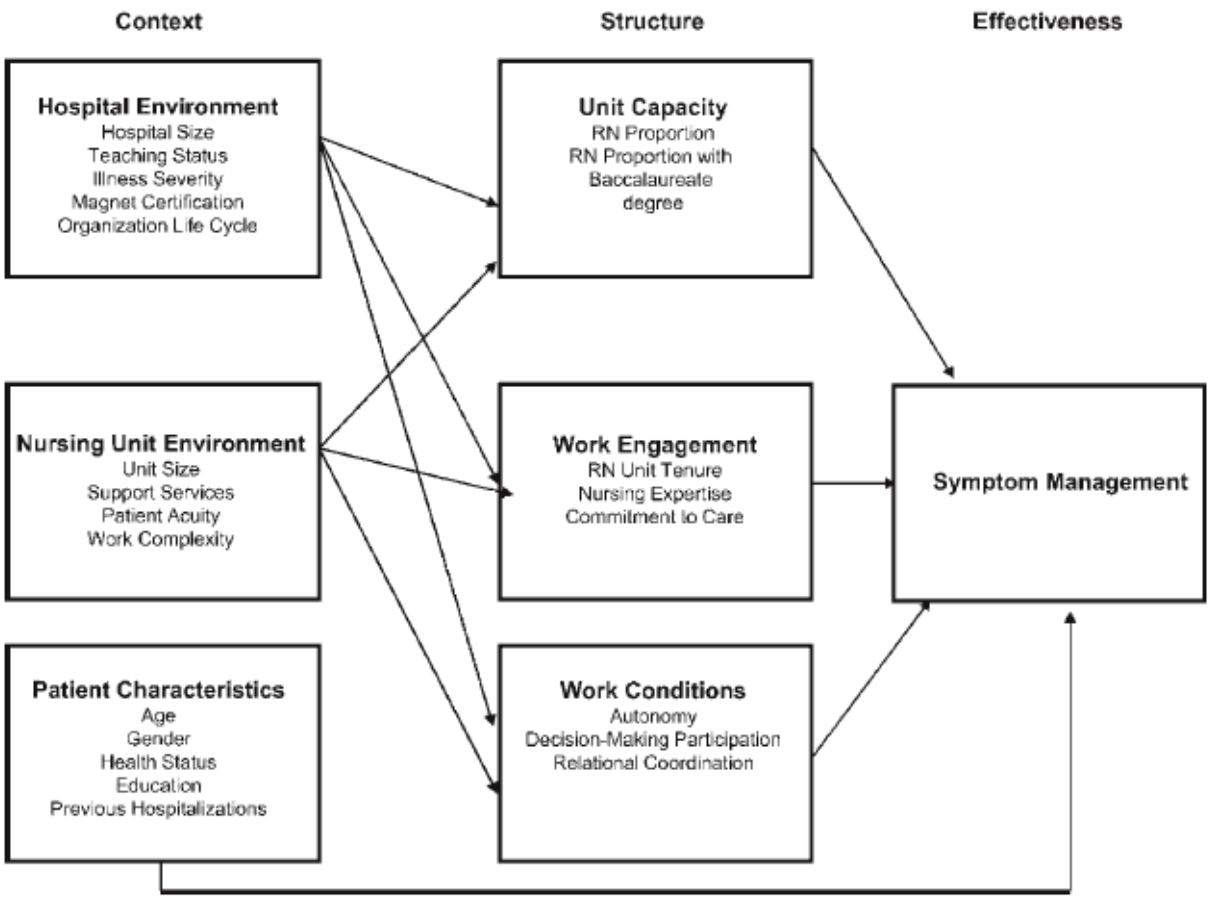

FIGURE 1. Research model.

RELATIONSHIPS AMOUND ORGANIZATIONAL CONTEXT AND STRUCTURE

External Environment

The external environment is composed of factors that are beyond the boundaries of the focal organization but that have the potential to influence the way the organization operates. The internal environment is composed of factors within the boundaries of the organization that affect its functioning. Because we assessed patients' perceptions of effective symptom management during hospitalization, we identified the nursing unit as the focal organization and conceptualized the hospital as the external environment.

The external (i.e., hospital) environment was specified using hospital size, teaching status, patients' illness severity, Magnet certification, and organizational life cycle. We included hospital size because size has been consistently linked to structural complexity in organizations (W. R. Scott, 2003). Evidence of a relationship between hospital size and organizational structure, however, is mixed. Although some researchers have found lower nurse staffing levels and a richer registered nurse (RN) skill mix in large hospitals (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002), these findings have not been supported in other studies (Mark, Salyer, & Wan, 2003; Mark et al., 2007). Further, Lake and Friese (2006) found no relationship between hospital

size and work environments that were structured to support professional nursing practice. We found no research on the relationships between hospital size or nursing unit structure and patient perceptions of symptom management. However, findings from several studies indicate that patients in smaller hospitals provide better ratings of their hospital experience and are more satisfied with their care than patients in larger hospitals (Finkelstein, Singh, Silvers, Neuhauser, & Rosenthal, 1998; Sjetne, Veenstra, & Stavem, 2007; Young, Meterko, & Desai, 2000).

Teaching status may influence patients' perceptions about symptom management because teaching hospitals are typically larger than nonteaching hospitals and provide more complex care using multiple types and levels of providers. Also, evidence from several studies indicates that patients in teaching hospitals tend to be sicker and report more problems during hospitalization than patients in non-teaching hospitals (Finkelstein et al., 1998; Hargraves et al., 2001; Iezzioni et al., 1990; Kravitz, 2001; Sjetne et al., 2007; Young et al., 2000). Therefore, patients may perceive the care they receive in a teaching hospital to be more impersonal and less responsive to their needs.

Illness severity was included in our model although evidence linking this variable to organizational structure is limited. Measuring illness severity using the Medicare case mix index, Mark et al. (2003) found a richer RN skill mix and more positive professional nursing practice environment in hospitals with a higher Medicare case mix index. Patients who are sicker may perceive greater symptom severity, which then may affect both their interpretation of their symptoms and their evaluation of symptom management. In addition, hospitalized patients who have persistently severe symptoms tend to be less satisfied with their care than patients who experience improvement in symptom severity (Desbiens et al., 1996; Jackson et al., 2001; Kroenke et al., 1999).

Magnet certification was included because research has found that Magnet hospitals are characterized by better nurse staffing and more favorable work conditions for nurses (Aiken, Sloane, Lake, Sochalski, & Weber, 1999). These structural features of hospitals with Magnet status are correlated with greater patient satisfaction (J.G. Scott, Sochalski, & Aiken, 1999) and thus may affect the extent to which patients perceive that their expectations for symptom management have been met. In addition, nurses who work in Magnet hospitals report more manageable workloads, less burnout, and lower intent to leave than those who work in non-Magnet hospitals (Lacey et al., 2007; Stone et al., 2007; Stordeur, D'Hoore, & NEXT Study Group, 2007). Although we found no studies linking these variables to symptom management, it is possible that the workload and work conditions in Magnet hospitals contribute to nurses' ability to meet patients' expectations for symptom management.

Organizational life cycle, defined as a change in the pattern of hospital admissions over two consecutive years, was included because we have found in prior work that instability in hospital admissions negatively affects the professional practice environment on nursing units (Mark et al., 2007, 2003). For example, Mark et al. (2007) found lower staffing adequacy and poorer work conditions in hospitals with a declining rather than a stable pattern of admissions.

Internal Environment

The internal (i.e., nursing unit) environment was specified using size (number of beds), availability of support services, patient acuity, and work complexity. Mark et al. (2003) found lower patient satisfaction on larger units and, given the greater work demands on larger units, lower patient evaluations of symptom management might also be expected. The availability of support services such as computerized physician order entry and patient transporters play an important role in determining work conditions for nurses (Mark et al., 2007). These support services contribute to an environment in which nurses have more control over their work and more time for patient care, which may have positive implications for symptom management (Mark et al., 2003). Higher patient acuity on the nursing unit imposes heavier demands on the nursing staff and may constrain the time that is available to attend to patients' symptoms. In addition, work complexity in terms of time constraints, work hindrances, and frequent interruptions can distract nurses from monitoring and responding to patients' symptoms. As such, both patient acuity and work complexity may have a substantial impact on nurses' ability to provide effective symptom management (Kiekkas et al., 2007; Upenieks, Kotlerman, Akhavan, Esser, & Ngo, 2007).

Patient Characteristics

Patients' age, gender, health status, education, and prior experiences with the health-care system influence their perceptions of symptom distress and the extent to which their expectations for symptom management are met. Older patients, women, and patients who are more highly educated rate their care more positively than do others (Carlson, Shaul, Eisen, & Cleary, 2002; Roohan, Franko, Anarella, Dellehunt, & Gesten, 2003; Young et al., 2000). Also, patients who rate their health status better are more likely than patients in poorer health to report that their expectations for symptom management have been met and to rate their care more positively (Roohan et al.). Finally, prior health-care experiences play a role in patients' symptom-related expectations because these experiences influence the way symptoms are interpreted and create an implicit standard of care that patients use to evaluate subsequent health-care encounters (Kravitz, 2001).

Relationships Among Organizational Structure and Effectiveness

Consistent with our theoretical model, we viewed administrative mechanisms that support adequate nurse staffing and promote positive work conditions as important aspects of the organizational structure of acute care hospitals. Accordingly, we specified structure at the nursing unit level with the constructs of staffing adequacy and work conditions.

In contrast to frequently used measures of nurse staffing such as nurse–patient ratios and hours of nursing care, we developed a comprehensive measure of staffing adequacy consistent with the American Nurses' Association (1999) conceptualization of nurse staffing. This measure included the proportion of RNs among the total nursing staff on the unit, proportion of RNs on the unit with a baccalaureate degree, and the characteristics of the RN workgroup in terms of unit tenure, nursing expertise, and personal commitment to patient care.

Although we expected these multiple indicators to load on a single factor representing staffing adequacy, exploratory factor analysis yielded two distinct factors. The first factor, which we named unit capacity, contained the indicators of RN proportion of the total nursing staff and proportion of RNs with a baccalaureate degree. Each of these indicators had a factor loading of .77; together the two indicators explained 60.4% of the variance in unit capacity. The other factor, which we named work engagement, contained the indicators of personal commitment to patient care (factor loading .95), nursing expertise (factor loading .93), and unit tenure (factor loading .39). Although the factor loading for unit tenure was slightly less than the .4 generally used as a cutoff, we retained it because of its theoretical importance. The three indicators in this factor explained 64% of the variance in work engagement.

Unit Capacity

Our measure of unit capacity reflected RN staffing and the educational preparation of RNs on the unit. Although numerous researchers have linked nurse staffing to better patient outcomes, no researchers examined the relationship between nurse staffing and symptom management. However, it is reasonable to argue that adequate staffing is essential to nurses' ability to respond promptly to patient needs. Further, the proportion of RNs on the unit has been associated with higher levels of patient satisfaction (Mark et al., 2003; Seago, Williamson, & Atwood, 2006). Although we found no studies linking nurses' educational level to symptom management, it can be argued that baccalaureate prepared nurses are more likely to have the knowledge needed to effectively manage patient symptoms.

Work Engagement

Work engagement, our second structural measure, was defined as the personal involvement in and commitment to the work that motivate an employee to invest more time, energy, and initiative in completing job assignments (Sonnetag, 2003). Highly engaged nurses may respond more proactively to patient needs and thus meet or even exceed patients' expectations for symptom management. Another component of work engagement is the expertise of the nursing workgroup. Although we found no studies of the effects of nursing expertise on symptom management, expert nurses may not only be able to detect and interpret clinical signs and symptoms more rapidly and accurately than novice nurses, they also may be better able to identify an appropriate course of action based on exemplars and analogies learned through experience (Ericcson, Whyte, & Ward, 2007). A third component of work engagement is unit tenure of the RN workgroup. Nurses with longer unit tenure tend to be more familiar with the type of patients who routinely receive care on their unit and may be better able to effectively respond to symptoms that commonly occur in a specific patient population. Therefore, patients may rate symptom management more positively on units where the nursing workgroup is characterized by higher levels of personal commitment to patient care, greater nursing expertise, and longer unit tenure.

Work Conditions

A third structural variable, work conditions, was included because there is growing evidence of a link between patient outcomes and work environments where nurses have autonomy or control

over nursing practice, participate in decision making, and engage in collaborative relationships—relational coordination—with other providers involved in patient care (Mark et al., 2007; Kramer & Schmalenberg, 2002). In addition, workgroups with strong relational coordination are more likely to achieve high-quality outcomes because they accurately communicate important patient information, share knowledge, and engage in effective group problem solving (Gittell, 2000). For these reasons, we hypothesized that work conditions characterized by greater nursing autonomy, participation in decision-making, and higher quality relational coordination would be positively related to patients' perceptions that their expectations for symptom management were met.

Results of the factor analysis supported the multiple indicator approach to measurement of this construct. Factor loadings for each of the indicators were as follows: autonomy (.68), participation in decision-making (.63), and relational coordination (.61). These three indicators explained 63.6%of the variance in work conditions.

METHODS

Design

This study was a secondary analysis of data obtained from the Outcomes Research in Nursing Administration Project-II (ORNA-II), a large multi-site study investigating the relationships of hospital context and structure to organizational, nurse, and patient outcomes (Mark, 2002). ORNA-II data were collected during 2003 and 2004 on two nursing units (medical, surgical, or medical–surgical units) in each of 146 U.S. acute care hospitals. Hospitals were randomly selected from the 2002 American Hospital Association Guide to Hospitals after excluding federal, for-profit, or psychiatric facilities and hospitals with fewer than 99 beds. Because eight units withdrew for the parent study, the sample for this analysis was 278 nursing units in 143 hospitals.

Data Collection

Each hospital appointed an on-site study coordinator to assist with data collection. The ORNA-II research team provided a 1 and ½ day training program for study coordinators in which data collection procedures were reviewed. The research team took several steps to insure data integrity. All study coordinators were given a procedure manual that included the information presented during the training. Once data were sent to the ORNA-II team, they were immediately reviewed and study coordinators contacted if data discrepancies were found. The research team performed all required data calculations to ensure that the same formulae were used for all hospitals and any mathematical errors were corrected.

RNs with more than 3 months of experience on their unit completed three questionnaires over a period of 6 months. Each of the questionnaires consisted of a different battery of instruments. Data collection was guided by Dillman's (1978) Total Design Method, in which a series of written reminders and duplicate questionnaires are distributed to enhance response rates. Staff nurses received a study questionnaire followed in 2 weeks by a second duplicate questionnaire reminding them of the importance of their participation. Two weeks following distribution of the duplicate questionnaire, a third reminder letter was distributed. The response rate were: 75% for

the Time 1 questionnaire, (n = 4,911); 58% for the Time 2 questionnaire, (n = 3,689), and 53% for the Time 3 questionnaire (n = 3,272).

In addition to the RN participants, 10 patients on each unit, 18 years of age or older, who had been hospitalized for at least 48 hours, were able to speak and read English, and were not scheduled for immediate discharge, were randomly selected to complete a questionnaire in which they rated the extent to which nurses were meeting their expectations for symptom management (response rate = 91%; n = 2,720). Data from patients were collected only at Time 3.

Measures of the External Environment

Hospital size was measured as the number of staffed beds and *teaching status* was measured as the ratio of medical and dental residents to the number of hospital beds. Data on these two variables were obtained from the American Hospital Association Annual Survey. *Illness severity* was measured using the hospital's Medicare case mix index. *Magnet status* was measured using a single item that asked whether the hospital was certified by the American Nurses Credentialing Center for Excellence in Nursing. *Organizational life cycle* was measured by classifying hospitals as *growers* if admissions to the hospital had increased 5% or more during two consecutive years; ''decliners'' if admissions had decreased 5% or more during two consecutive years; ''stable'' if admissions had not increased or decreased more than 5% during two consecutive years; ''unstable'' if admissions had increased or decreased more than 5% in one but not in both consecutive years; and, ''highly unstable'' if admissions had increased more than 5%in the first year then decreased more than 5%in the second year or decreased more than 5% in the first year then increased more than 5% in the second year. Data on illness severity (i.e., case mix index), Magnet status, and organizational life cycle were obtained from study coordinators.

Measures of the Internal Environment

Unit size was measured as the number of staffed beds. *Support services availability* was measured using a 21-item checklist of unit-level support services, including, for example, patient transport, computerized order entry, intravenous team services, and coordination of discharge planning. Because each item was rated as not available, inconsistently available, or consistently available, scores on this measure could range from 0 to 42 with higher scores indicating greater availability (Mark et al., 2007). With regard to measuring *patient acuity*, it would have been ideal had all hospitals in the study used the same patient acuity measurement system, but that was not the case. Therefore, we turned to a theoretical approach, applicable to all nursing units in the study, developed by Overton, Schneck, and Hazlett (1977) and refined by Mark and Hagenmueller (1994) and Mark et al. (2007). *Patient acuity* was measured using a 14-item Likert-type questionnaire that elicited nurses' perceptions of patient-related demands on their unit in terms of the extent to which it was difficult to predict whether a specific action taken by nurses had the intended effect on patients, the extent to which patient conditions changed rapidly, and the extent to which a variety of different types of patients were admitted to the unit. Scores on this scale can range from 14 to 70 with higher scores indicating greater patient acuity. *Work complexity* was measured by a seven-item Likert-type questionnaire on which nurses rated the extent to which their work was characterized by frequent interruptions or unanticipated events (Salyer, 1996). Because these items are anchored by six response options ranging from *strongly*

disagree to *strongly agree*, scores from 7 to 42 are possible with higher scores indicating greater work complexity.

Except for unit size, the variables used to measure the nursing unit environment were collected from staff nurses and aggregated to the unit level. Justification for data aggregation was based on achieving values equal to or greater than .70 for the r_{wg} statistic, which estimates within group agreement (James, Demaree, & Wolf, 1984). Reliability of the aggregated data was evaluated by calculating the proportion of variance explained by group membership using the intraclass correlation coefficient or ICC (1) and mean rater reliability using ICC (2). ICC (2) values of .70 or higher indicate acceptable group-level reliability (Bleise, 2000). Table 1 provides information on Cronbach's alphas, ICC (1), ICC (2), and r_{wg} for the perceptual measures used in the study.

Table 1. Descriptive Statistics for Variables in the Model

Variable	Mean (*SD*)	%	Coefficient α	ICC (1)	ICC (2)	r_{wg}
Organizational context						
Hospital environment						
Hospital size (number of beds)	345.8 (185.2)					
Teaching status	.13 (.25)					
Case mix index	1.44 (.31)					
Magnet certification (%)		13				
Organizational life cycle (%)						
Stable		57				
Growers		5				
Decliner		3				
Highly unstable		2				
Unstable		32				
Nursing unit environment						
Unit size (number of staffed beds)	33.5 (11.1)					
Support services availability	32.4 (2.5)		.80	.15	.75	.71
Patient acuity	45.6 (3.6)		.81	.10	.65	.74
Work complexity	26.8 (3.5)		.85	.14	.74	.69
Patient characteristics						
Age	56.9 (7.5)					
Gender (% females)		56				
Health status	3.5 (.4)					
Education (% $\geq$high school)		50				
Prior hospitalization experience in past year (%)		53				
Nursing unit structure						
Unit capacity						
RN proportion		59.4				
RN proportion with baccalaureate degree		36.5				
Work engagement						
RN unit tenure (number of months)	74.7 (33)					
Nursing expertise	42.4 (2.1)		.92	.11	.66	.89
Commitment to care	36.6 (1.84)		.82	.10	.67	.84
Work conditions						
Autonomy	89.6 (6.3)		.92	.25	.81	.87
Participation in decision-making	15.7 (2.1)		.78	.30	.85	.83
Relational coordination	226.1 (12.7)		.95	.20	.77	.86
Organizational effectiveness						
Symptom management	27.4 (2.4)		.86	—	—	—

RN, registered nurse.
Note: Variables measured at the nominal or ordinal level were summarized using %; variables measured at the interval or ratio level were summarized using means and standard deviations.

Measures of Patient Characteristics

Data on patients' age, gender, education, and hospitalizations during the previous year were obtained from surveys administered to patients on each nursing unit. Patients also rated their health status using a single item, with response options ranging from *very good* to *very poor*. In a recent meta-analysis of 22 studies, DeSalvo, Bloser, Reynolds, He, and Muntner (2005) reported that a single-item self-report indicator of health status provides valid information that summarizes patients' perceptions of various health-related domains.

Measures of Organizational Structure

Unit capacity was measured as the proportion of RNs among the total nursing staff on each unit, as reported by study coordinators, and the proportion of RNs with a baccalaureate degree in nursing, obtained by RN self-report. *Work engagement* was measured as aggregated responses to 16 Likert-type items from the Nursing Expertise and Commitment to Care Scale (Minick, Dilorio, Mitchell, & Dudley, 2000). Eight items from this scale were used to measure the expertise of the nursing workgroup in terms of their ability to recognize critical patient problems. The remaining eight items were used to measure personal commitment to patient care in the nursing workgroup and the extent to which this commitment was demonstrated by initiating actions independently in response to patient problems. Items on these two subscales were anchored by response options ranging from *strongly agree* to *strongly disagree*, resulting in possible scores of 8–48 for each, with higher scores indicating greater nursing expertise and personal commitment to patient care.

Work conditions were measured as the aggregated scores obtained from three instruments measuring nurses' autonomy, participation in decision-making, and relational coordination. Autonomy was measured by the 16-item Control over Nursing Practice Scale, as modified by Gerber (1990). This tool assesses the extent to which nurses feel they can engage in consultation with others about complex care problems, influence the care received by their patients, and act on their own decisions. Items were rated on a six-point Likert-type scale with a possible score range of 16–112; higher scores indicate greater autonomy. Participation in decision-making was measured with a six-item five-point Likert-type scale on which nurses rate their involvement in unit decisions (Mark & Hagenmueller, 1994). Scores on this scale could range from 6 to 30 with higher scores indicating greater participation. Relational coordination was measured using the Relational Coordination Scale (Gittell et al., 2000), a five-point Likert-type scale on which collaboration with other members of the health-care team was rated in terms of both communication and relationship quality. Communication quality includes frequency, timeliness, accuracy, and problem-solving; relationship quality addresses the extent to which team members share goals and knowledge and demonstrate mutual respect. Scores on the Relational Coordination Scale could range from 63 to 315, with higher scores indicating higher quality relational coordination.

Measures of Organizational Effectiveness

Effectiveness was measured using the Symptom Distress Scale (McCorkle & Young, 1978), which was modified to address the following symptoms commonly experienced during hospitalization: nausea, pain, difficulty sleeping, headache, mobility issues, and lack of energy. Items on this unidimensional scale were rated using five response options ranging from much less than expected to much more than expected. Total scores on this scale can range from 6 to 36, with higher scores indicating a more positive evaluation of the extent to which expectations for symptom management have been met.

Data Analysis

Data were analyzed using the Mplus statistical program (Muthe´n & Muthe´n, 1998–2006). We first regressed the structural variables on the contextual variables, and then regressed the symptom management variable on the structural variables and patient characteristics variables. We used the *complex* modeling method because it computes standard errors and chi-square tests that correct for the clustering of nursing units within hospitals. Additionally, we evaluated the model with standard tests of model fit including the chi-square statistic, with a non-significant value indicating a well-fitting model; goodness of fit (GFI) and Tucker–Lewis (TLI) indices, with values close to 1.0 for each indicating a well-fitting model; and root mean square error of approximation (RMSEA), with values less than .05 indicating a well-fitting model.

Prior to analysis, we examined patterns of missing data. The general approach was to use mean imputation when there was less than 10% missing data. The specific mean for imputation depended on the level at which the missing data occurred. For example, if data were missing at the individual level, the person mean was used; if data were missing at the unit level, the unit level mean was used. When more than 10% of the data were missing and a rationale could be developed for identifying theoretically relevant predictor variables, we used regression techniques to impute missing values (Roth & Switzer, 1995).

RESULTS

Descriptive Results

Descriptive statistics for all study variables along with relevant psychometric information are presented in Table 1. The hospital data indicate that the sample was comprised primarily of large hospitals that treated a complex mix of patients. Average patient age was 56 years and the typical patient was female (55%) and had been hospitalized at least once during the past year (52%). On average, patients rated their health status as fair to good. The average symptom management score indicated that patients evaluated nurses' responsiveness midway between having done about as much as expected and somewhat more than expected in response to their symptoms.

Impact of Hospital and Nursing Unit Characteristics on Unit Structure

Unit capacity. Table 2 presents the unstandardized regression coefficients for the relationships in the model. Hospital size, teaching status, and illness severity were significantly (i.e., $p < .05$) related to unit capacity, with higher levels of unit capacity among larger hospitals, teaching hospitals, and those with more severely ill patients. In contrast, hospital life cycles characterized by declining or unstable admissions were significantly but negatively related to unit capacity. That is, hospitals with a decrease of 5% or more in admissions for two consecutive years (decliners) or a decrease or increase of 5% or more in admissions for only one of two consecutive years (unstable) had lower levels of unit capacity. None of the nursing unit characteristics significantly predicted unit capacity. The model explained 25.4% of the variance in unit capacity.

Work engagement. Hospital life cycle was a significant predictor of work engagement. Nurses in hospitals classified as growers reported significantly lower levels of work engagement than nurses in other hospitals. The only other significant predictor of work engagement was work

complexity, with higher levels of complexity associated with lower levels of work engagement. Variables in the model explained 9.7% of the variance in work engagement.

Work conditions. Nurses in Magnet hospitals reported significantly better work conditions than did their non-Magnet counterparts. Greater availability of support services on the unit was also associated with better work conditions; greater work complexity on the unit was associated with poorer work conditions. Hospital life cycle was associated with work conditions in that nurses in hospitals with a declining pattern of admissions reported poorer work conditions than did their counterparts. The model explained 25.8% of the variance in work conditions.

Table 2. Unstandardized Parameter Estimates and Standard Errors for Variables in Model

	Unit Capacity		Work Engagement		Work Conditions		Symptom Management	
	Estimate	Std Error	Estimate	Std Error	Estimate	Std Error	Estimate	Std Error
Hospital environment								
Hospital size	.001*	.001	.000	.001	.000	.001		
Teaching status	1.804**	.424	−.037	.551	.014	.910		
Case mix index	.545*	.257	.999	.527	.469	.389		
Magnet certification	.374	.317	.182	.455	1.116**	.383		
Organizational life cycle								
Growers	.485	.273	−1.299*	.626	−.899	.555		
Decliner	−.963*	.449	−.725	.580	−1.564*	.732		
Highly unstable	−1.010*	.466	.667	.499	−.787	.665		
Unstable	−.257	.210	−.152	.350	−.041	.306		
Nursing unit environment								
Unit size	−.002	.008	.001	.010	−.009	.011		
Support services availability	.016	.042	.090	.068	.214***	.066		
Patient acuity	.024	.022	.007	.034	.028	.037		
Work complexity	−.051	.026	−.114**	.048	−.21***	.042		
Patient characteristics								
Age							.082***	.020
Gender (% females)							−1.380	.940
Health status							.692	.377
Education							1.098	.857
Prior hospitalization experience in past year							−.694	.805
Nursing unit structure								
Unit capacity							−.152	.092
Work engagement							.047	.062
Work conditions							.144*	.069
Intercept	−1.565	1.815	−1.580	3.575	−3.060	3.020	20.908	2.039
r^2	.254		.097		.258		.136	

*$p \leq .05$.
**$p \leq .01$.
***$p \leq .001$.

Impact of Patient Characteristics and Unit Structure on Effectiveness

Patient age was significantly associated with patient perceptions that their expectations for symptom management were met; older patients reported better symptom management. None of the other patient characteristics, however, was associated with patients' perceptions of symptom management. The only structural variable significantly associated with patients' expectations for symptom management was working conditions. Patients were more likely to state that their expectations for symptom management were met on units where the nursing workgroup reported better work conditions. The model explained 13.6% of the variance in symptom management. Overall, the model we tested provided an excellent fit to the data with a chi-square value of 30.228 (df = 29; p = 40); CFI = .994; TLI = .98; and RMSEA = .01.

DISCUSSION

Using SCT, we tested a model of contextual variables (i.e., external and internal environments), organizational structure (i.e., unit capacity, work engagement, and work conditions), and patient characteristics and their impact on effectiveness in meeting patients' expectations for management of their symptoms. Although we expected relatively consistent effects of context on nursing unit structure, we found that the contextual variables in our model differentially predicted structure. Variables representing the hospital environment predicted unit capacity; a combination of hospital and nursing unit variables significantly predicted work engagement and work conditions. The hospital environment variables of size, teaching status, and severity of illness had significant positive impacts on composition of the nursing staff at the unit level; a hospital life cycle characterized by a declining or unstable pattern of admissions had a significant negative impact. These findings suggest that the nature of the hospital itself may determine staffing policies, which are then evident at the unit level. For example, it is possible that the intensity of nursing care required by patients who are more severely ill and those who are treated in a larger hospital or a teaching hospital necessitates a complement of nursing personnel that is balanced toward a higher proportion of RNs and a higher proportion of RNs who are prepared at the baccalaureate level.

Both hospital life cycle and work complexity on the nursing unit had a significant impact on a behavioral dimension of unit structure (i.e., work engagement, which we defined as nursing expertise, personal commitment to patient care of the nursing workgroup, and unit tenure). We found that hospitals classified as growers had lower levels of work engagement. Also, greater work complexity on the nursing unit was associated with lower work engagement. These findings suggest that a pattern of increased hospital admissions or frequent interruptions, distractions, changes in physician orders, and patient transitions on the unit have implications for the nursing workgroup in terms of shorter unit tenure, less nursing expertise, and lower personal commitment to patient care. Thus, our findings suggest the problematic effects that can result from a pattern of increased admissions at the hospital level or frequent work disruptions at the nursing unit level.

The third structural variable we investigated was work conditions, defined as nurses' perceptions of their freedom to make autonomous decisions, participate in decision-making, and establish and maintain high-quality relationships with other professional provider groups (i.e., relational coordination). Both hospital and unit level contextual variables predicted work conditions. Although Magnet certification was not a significant predictor of either unit capacity or work

engagement, nurses in Magnet hospitals reported significantly better work conditions. This finding is consistent with the findings of other researchers that Magnet hospitals are more likely to provide work conditions that support professional nursing practice (J. G. Scott et al., 1999).

Work complexity had a negative impact on work conditions, also suggesting that the chaotic environment that is typical on many nursing units may contribute to the perception that work conditions are not conducive to enacting professional nursing practice. Interestingly, the availability of support services, which had no relationship to work engagement, was a significant predictor of work conditions, suggesting that services that mitigate nurses' workload contribute to better work conditions.

We expected all the structural variables in our model to significantly predict patients' perceptions of symptom management. However, the impact of work conditions on symptom management was the only significant relationship supported by the data. This finding points to the role of work conditions that support professional nursing practice in facilitating nurses' ability to effectively manage patient symptoms. This also suggests that unit capacity and work engagement may be of limited benefit in ensuring that patients' symptoms are effectively managed. In other words, units that are adequately staffed with nurses who demonstrate high levels of work engagement may be unable to achieve effective symptom management in the absence of work conditions that support nursing autonomy, participation in patient care decisions, and strong relational coordination. These findings emphasize the need to establish and maintain work conditions that ensure appropriate utilization of RNs who, because of their constant contact with patients, can be a valuable resource in identifying and initiating interventions that contribute to effective symptom management.

Although our final model fit the data well, the model explained only a limited amount of the variance in symptom management. This suggests that the model, derived from SCT, might require modification in future research. Other work design factors that we did not explore may be related to how well patients perceive that their symptoms have been managed. For example, some research findings suggest that nurses working longer (i.e., 12 hours) shifts are more fatigued, have more impaired judgment, slower response times, and are less alert (Kalisch, Begeny, & Anderson, 2008). Thus, patients might perceive their symptom management as less effective when nurses work longer shifts, and future research in this area should include shift length as a work design variable.

In terms of patient characteristics, it would be useful to obtain more detailed information on patients' health status and its relationship to their perceptions of symptom management. Our study used a single indicator to measure health status, and this provided only a general evaluation. With greater depth and variation in health status measurement, a relationship to symptom management might be revealed.

Future researchers studying symptom management should also investigate the impact of the consistency of nurse providers. For example, when nurses work schedules in which they are assigned to patients on a consistent basis over a period of several days, they have substantially more time and opportunity to build enhanced relationships with their patients, improve intra and interdisciplinary teamwork, and avoid multiple (and sometimes unnecessary) handoffs, all of

which have the potential to improve symptom management for patients. Thus, actual work patterns of nurses in terms of shift length and provider consistency might be relevant contextual variables that should be included in a modified structural contingency model.

Our findings must be interpreted in light of several limitations. Although random sampling was used to recruit patients, sampling bias remains a concern. Lasek, Barkley, Harper, and Rosenthal (1997) found that patients who completed hospital opinion surveys were more likely than non-respondents to be female, older, married, and report their health status as better. These demographic characteristics also influence patients' evaluation of their care (Brown et al., 2008; Hargraves et al., 2001; Kravitz, 2001); patients who complete hospital surveys are also more likely to have positive perceptions of their hospital experience (Mazor, Clauser, Field, Yood, & Gurwitz, 2002; Perneger, Chamot, & Bovier, 2005). Consequently, the patients who participated in our study may not be representative of all patients admitted to the same unit. In addition, although there is extensive research that documents patients' tendency to respond extremely positively on patient satisfaction surveys (Hargraves et al.; Hays&Ware, 1986), we were unable to evaluate social desirability as a potential source of bias in patients' responses to the symptom management scale. Further, we were unable to collect information about patients' hospital experience (duration of hospital stay or days in intensive care), type of admission (emergency or scheduled), or primary diagnosis. These factors affect symptom severity, duration, and distress, which, in turn, contribute to patients' evaluation of symptom management (Hargraves et al.; Kroenke, 2001).

CONCLUSION

Despite these limitations, our study highlights the importance of work conditions that support full utilization of RNs in the management of patients' symptoms. Further studies are needed to identify organizational contexts and structures that foster the delivery of hospital care that is consonant with patients' expectations for symptom management.

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