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Nursing Practice Environment and Outcomes for Oncology Nursing

KEY WORDS

Burnout
Job satisfaction
Nurse practice environment
Oncology nurse
Quality of care

Background: It is commonly assumed that oncology nurses experience high job-related burnout and high turnover because their work involves inherent stressors such as caring for patients with serious and often life-threatening illness. **Objectives:** The objectives of this study were to examine the differences in outcomes such as job dissatisfaction and burnout between oncology nurses and medical-surgical nurses, and to identify factors that affect oncology nurse outcomes. **Methods:** A secondary analysis of nurse survey data collected in 2006 including 4047 nurses from 282 hospitals in 3 states was performed; *t* test and χ^2 test compared differences between oncology nurses and medical-surgical nurses in nurse outcomes and their assessments of nurse practice environment, as measured by the Practice Environment Scale of the Nursing Work Index. Logistic regression models estimated the effect of nurse practice environment on 4 nurse-reported outcomes: burnout, job dissatisfaction, intention to leave the current position, and perceived quality of care. **Results:** Oncology nurses reported favorable practice environments and better outcomes than did medical-surgical nurses. All 4 subscales of the Practice Environment Scale of the Nursing Work Index studied were significantly associated with outcomes. Specifically, nurses who reported favorable nursing foundations for quality of care (eg, active in-service or preceptorship programs) were less likely to report burnout and leave their current position. **Conclusions:** Better practice environments, including nurse foundations for quality care, can help to achieve optimal nurse

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outcomes. **Implications for Practice:** Improving hospital practice environments holds significant potential to improve nurse well-being, retention, and quality of care. Specifically, hospitals should consider preceptor programs and continuing education and increase nurses' participation in hospital decision making.

There were approximately 12 million Americans living with cancer by 2008, and it was estimated more than 1.6 million new cancer cases were diagnosed in 2012.¹ From a societal perspective, cancer remains a feared illness that calls forth images of death, pain, and suffering for patients and health professionals alike. Given the challenging clinical situations posed in the patient population, nurses working in cancer care might be expected to experience significant job-related burnout, tend to be dissatisfied with their jobs, and be more likely to express an intention to leave their position. Considering the global nursing shortage² and the fact that cancer affects a significant proportion of the American population, it is in the public's interest to be able to attract and retain highly qualified nurses in oncology to provide high quality of cancer care.

Several decades of research have investigated the relationship between nursing job outcomes and nurse practice environments, defined as "the organizational characteristics of a work setting that facilitate or constrain professional nursing practice."³ These organizational characteristics include nurses' status in the hospital hierarchy, their relationships with physicians, and opportunities for self-development. Research has identified significant relationship between favorable nurse practice environments and favorable nurse outcomes such as lower nurse burnout, less job dissatisfaction, and lower nurse turnover rates.^{1,4,5} However, studies specific to the oncology settings have been limited by small sample sizes and the omission of important covariates. It is crucial to understand the practice environment of oncology nurses in order to retain enough oncology nursing staff to deliver high-quality care to patients with cancer and their families. In this study, we compared outcomes between nurses working in oncology units and medical-surgical units in adult general hospitals, and identified nursing organizational factors that affect oncology nurse outcomes. The study results provide administrators with actionable recommendations to improve nurse outcomes in oncology settings.

■ Background

Previous studies have demonstrated relationship between nurse practice environments and a range of nurse and patient outcomes. Hospitals with poor nurse practice environments were more likely to have higher mortality rates,⁶ higher nurse job dissatisfaction, and higher nurse turnover rate.⁵⁻⁷ Nurses working in hospitals with more favorable nurse practice environments reportedly had fewer needle-stick injuries,⁸ lower emotional exhaustion, lower depersonalization, and less intention to leave their current position.⁹ Taking into account this robust research literature on nurse practice environments, the Institute of Medicine

(IOM) report "Keeping Patients Safe" identified the importance of favorable nurse practice environments for patient safety.¹⁰

Aiken and colleagues¹¹ developed a conceptual framework that outlines the relationship between organizational forms, nursing operational mechanisms, and outcomes. This framework posits that hospital organizational forms (in this study, nursing specialization) affect outcomes by improving nurse autonomy, granting greater control over resources to nurses, and strengthening nurse-physician relations. These 3 mechanisms enhance patient and nurse outcomes. One reason identified by studies examining this issue in critical care and human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) suggests that patients in specialty units are more likely to have similar conditions and interventions.^{12,13} Nurses in specialty units face less diagnostic diversity¹⁴ and are more likely to develop in-depth expertise and competencies in specialty patient care, whereas nurses in general units work across specialties and have challenge to maintain the same depth of knowledge and expertise across multiple medical specialties. Moreover, in specialty units where both nurses and physicians are working within a specialty, nurses communicate with fewer different physicians and thus have opportunities to develop close collaboration. Therefore, nurses working in specialty units are hypothesized to have more control over their work and use their specialty knowledge to communicate more effectively with physicians and other healthcare clinicians, which lead to favorable nurse and patient outcomes. These hypotheses were supported by empirical observations that 30-day mortality rates for patients with AIDS were significantly lower in hospitals with dedicated AIDS units than in matched hospitals where AIDS patients were treated on general medical units.⁴

The IOM and the National Cancer Policy Board¹⁰ have identified a pending crisis in the oncology workforce. The workshop identified a shortage of sufficiently trained physicians, nurses, and other healthcare providers to deliver required care to the growing number of patients with cancer in the United States. One key strategy outlined by the IOM panel is to retain existing oncology providers, particularly oncology nurses. With the global shortage of nursing personnel¹⁵ and expansion of health insurance coverage associated with health reform in the United States, difficulties persist in recruiting and retaining oncology nurses as workloads increase¹⁶ and practice environments remain challenging.¹⁷

Research has shown that nurses working in oncology settings experience emotional exhaustion,¹⁸⁻²⁰ job dissatisfaction,²⁰ and intent to leave their oncology nursing position.¹⁹ The few studies that examined nurse practice environments and nurse-reported outcomes in oncology settings have found a significant relationship between unfavorable working environment

and adverse nursing outcomes²¹ and identified areas for improvement. Using nurse survey data from 1998, Friese²² identified more favorable nurse practice environments for oncology nurses, compared with nurses working in medical-surgical units. For oncology nurses, staffing and resource adequacy was significantly associated with emotional exhaustion, job dissatisfaction, and nurse-reported quality of care. Nurse manager leadership and support were associated with job satisfaction. Collegial nurse-physician relations were strongly and significantly associated with quality of care.²² Cummings and colleagues²³ used a structural equation modeling approach to examine oncology nursing job satisfaction. They found that relational leadership and physician-nurse relationships significantly influenced opportunities for staff development, nurse staffing adequacy, nurse autonomy, nurse participation in policy decisions, and supervisor support for innovative ideas and conflict management. All these in turn were associated with nurses' job satisfaction. Similarly, a more recent study confirmed that nurse staffing, nursing leadership, and participation in policy decisions contributed to job satisfaction.²⁴

Although a few previous studies identified the relationship between more favorable nurse practice environments and better oncology nurse outcomes, these studies were limited by relatively small sample sizes²² or a singular focus on job dissatisfaction.²³ To extend the knowledge in how nurse practice environments are related to nurse outcomes, the current study uses a large, multistate nurse survey that included 708 oncology nurses and more than 3000 medical-surgical nurses in 282 hospitals. In this study, we compared nurse-reported outcomes and nurse practice environments between oncology inpatient and general medical-surgical inpatient settings, and identified organizational factors that affect oncology nurse outcomes, such as burnout, job dissatisfaction, intention to leave current position, and quality of care.

■ Methods

We conducted a secondary analysis of data using a 3-state (Pennsylvania, California, and New Jersey) nurse survey collected in 2006. A large random sample (40% of registered nurses in Pennsylvania, and California and 50% in New Jersey) was surveyed, with methods that have been published previously.¹⁵ Surveyed nurses identified their unit type, assessed their practice environments, and reported their own patient workload. Approximately 4074 registered nurses who worked in direct patient care in general acute hospitals were included in this analysis, of which 708 nurses worked in oncology specialty inpatient units and 3339 nurses worked in medical, surgical, or mixed medical-surgical inpatient units.

Nurse Practice Environments

The nurse practice environments was measured using the Practice Environment Scale of the Nursing Work Index (PES-NWI),

a 31-item instrument endorsed by the National Quality Forum as 1 of 15 nurse-sensitive performance measures.^{3,25} The PES-NWI uses a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree) to measure the presence of organizational features that support professional nursing practice. The PES-NWI has 5 subscales:

- (1) nurse participation in hospital affairs, referring the opportunities for staff nurses to participate in hospital and nursing committees and hospital policy decisions;
- (2) nursing foundations for quality of care, reflected by whether hospitals provide preceptor system, active in-service, and continuing education programs for nurse self-development;
- (3) nurse manager ability, leadership, and support of nurses, referring whether the supervisory staff is supportive of the nurse practice;
- (4) staffing and resource adequacy, measuring whether hospitals have enough nursing staff to provide quality patient care; and
- (5) collegial nurse-physician relations are good working relationships between physicians and nurses.

Acceptable validity and reliability for PES-NWI have been reported previously.^{3,26} We calculated Cronbach α 's for all subscales and composite score using this sample, which ranged between .85 and .95, showing good or excellent internal consistency reliability.²⁷ Using previously described measurement techniques,²⁶ we aggregated individual nurse responses to construct a hospital-level mean for each item, then calculated hospital-level mean for each subscale and transformed these values into one 3-level variable (ie, favorable, mixed, and unfavorable nurse practice environments). Hospitals with 4 subscales above the median values obtained from the survey sample were classified as favorable, hospitals with 1, 2, or 3 subscales above the median were classified as mixed, and those with zero subscale above the median were classified as unfavorable nurse practice environments.

Nurse Outcomes

The survey assessed 4 nurse outcomes: burnout, job dissatisfaction, intention to leave the current position, and nurses' assessment of quality of care. Derived from the extensively validated Maslach Burnout Inventory,^{28,29} the emotional exhaustion scale was identified previously as the driving force for nurse burnout.³⁰ Consistent with prior reports,^{6,30} in this analysis we dichotomized the emotional exhaustion value by using a cutoff score of 27, as a score higher than 27 reflects a high level of emotional exhaustion.²⁹ Job dissatisfaction, intention to leave, and quality of care were all obtained from single-item measures that were collapsed into dichotomized variables: dissatisfied or satisfied, intent to leave current position or not, and poor-to-fair or good-to-excellent quality of care reported. To measure nurse staffing, we obtained the nurses' responses to 1 question that asked for the number of patients they cared for on their last shift, which is a staffing measure with good reliability and predictive validity.^{6,31}


Data Analysis

We used *t* test and χ^2 test to compare differences between oncology nurses and medical-surgical nurses. We used the full sample for the group comparison because we want to preserve the accurate distribution of nurses (medical-surgical to oncology). We also took a 25% random sample of medical-surgical nurse, which shows no significant differences in nurse characteristics and outcomes from the full medical-surgical nurse sample.

Logistic regression models were used to identify the variables significantly related to each of the 4 nurse outcomes (treated as dichotomous variables), after controlling for nurses' demographics and nurse staffing level (patient-to-nurse ratio). We performed 2 analyses to assess the relationship between the 4 outcomes and the nurse practice environments. In the first set of models, we entered a categorical measure (ie, unfavorable, mixed, or favorable) based on the categorization of the PES-NWI subscales described above for oncology nurses and 25% random sample of medical-surgical nurses separately. The categorized PES-NWI is used because it is easier to interpret and simplifies the communication between managers in comparing nurse practice environments in hospitals.²⁶ In the second set of models, we entered hospital-level means for each PES-NWI subscale into separate logistic regression models for the oncology nurse group only to examine which nurse practice environment feature influences the oncology nurse outcomes. Because of the high correlation between nurse-reported workload and the staffing and resource adequacy subscale of the PES-NWI, we excluded this subscale from the models, as in previously published reports. We chose the nurse-reported patient load over the PES-NWI subscale of staffing and resource adequacy in the model because the staffing and resource adequacy subscale is a perceived measurement of staffing and associated with other working environment subscales. The nurse-reported patient load provides an actual measure of staffing and is less likely to be related to other working condition measures.³² All models were estimated at the individual nurse level, with hospital-level fixed effects for nurse practice environments included. All model estimates were calculated using generalized estimating equations to account for clustering of nurses within hospitals.

Results

Table 1 summarizes the characteristics of study sample and compares the oncology nurses from medical-surgical nurses. There were significant differences between the oncology nurses and medical-surgical nurses in educational attainment, nurse staffing, and 3 of the 4 nurse outcomes. Compared with nurses working in medical-surgical units, oncology nurses had higher educational attainment and lower workloads. Oncology nurses were also less likely to score in the high burnout range for emotional exhaustion in the Maslach inventory and to report job dissatisfaction and poor or fair quality of care than medical-surgical nurses.

 **Table 1 • Comparing Oncology and Medical-Surgical (Med-Surg) Nurses in Demographics and Nurse Outcomes**

	Oncology Nurses (n = 708)	Med-Surg Nurses (n = 3339)	<i>P</i> ^a
Demographics			
Age, mean (SD)	43.2 (10.9)	43.2 (11.2)	.90
Years in nursing, mean (SD)	13.7 (10.6)	14.2 (11.0)	.31
Male, %	4.4	5.9	.12
Hold BSN degree or higher, %	42.5	37.6	<.05
Race/ethnicity (white vs nonwhite), %	70.9	68.9	.28
Patient-to-nurse ratio, mean (SD)	6 (3.94)	7 (4.03)	<.001
Nurse outcomes, %			
High emotional exhaustion	36.8	41.2	<.05
Job dissatisfaction	24.1	28.4	<.05
Intend to leave position in the next year	13.4	13.9	.72
Fair or poor quality of care	18.1	23.1	<.01

Abbreviation: BSN, bachelor's of science in nursing.

^a*t* test and χ^2 test were performed for comparison between oncology nurses and med-surg nurses.

Table 2 compares the nurses' perception of the nurse practice environments between oncology nurses and medical-surgical nurses. A higher proportion of nurses working in oncology units reported that they worked in hospitals with favorable nurse practice environments ($P < .001$). Compared with medical-surgical nurses, oncology nurses had significantly higher scores on 2 of the 5 PES-NWI subscales—staffing and resource adequacy and nursing foundations for quality of care.

Table 3 displays the logistic regression model results for each of the 4 nurse outcomes with PES-NWI entered as categorical variable for oncology nurses (n = 708) and 25% random sample of medical-surgical nurses (n = 834) separately. Oncology nurses who reported working in hospitals with favorable nurse practice environments were significantly less likely to experience high burnout and job dissatisfaction and report fair-to-poor quality of care ($P < .001$) than those who reported working in hospitals with unfavorable nurse practice environments. Oncology nurses working in hospitals with mixed nurse practice environments were also less likely to report fair-to-poor quality of care than those working in hospitals with unfavorable nurse practice environments ($P < .01$). No significant relationship was found between the nurse practice environments and nurses' intent to leave. For the medical-surgical nurses, similar trends were observed between nurse practice environments (favorable practice environments) and all 4 nurse outcomes.

To elucidate the aspects of the nurse practice environments associated with the 4 nurse outcomes, we replaced the categorization of the nurse practice environments with 4 PES-NWI subscales in the logistic regression models, using the same

Table 2 • Comparing Oncology and Medical-Surgical (Med-Surg) Nurses in Practice Environments

PES-NWI Subscale	Oncology Nurses (n = 708), Mean (SD)	Med-Surg Nurses (n = 3339), Mean (SD)	P ^a
Staffing and resource adequacy	2.46 (0.82)	2.37 (0.77)	<.01
Nursing foundations for quality of care	3.07 (0.55)	3.02 (0.54)	<.05
Collegial nurse-physician relations	2.88 (0.69)	2.83 (0.67)	.05
Nurse participation in hospital affairs	2.68 (0.66)	2.64 (0.66)	.14
Nurse manager ability, leadership, and support	2.61 (0.82)	2.62 (0.79)	.76
Work environment, ^b %			<.001
Unfavorable	28.5	34.8	
Mixed	21.1	22.7	
Favorable	50.4	42.5	

Abbreviation: PES-NWI, Practice Environment Scale-Nursing Work Index.

^at test and χ^2 test were performed for comparison between oncology nurses and med-surg nurses.

^bConstructed from the subscales above the median for the entire survey sample.

covariates described previously. The staffing and resource adequacy subscale was excluded from the models because of its high correlation with nurse-reported patient load. Oncology nurses who rated nursing foundations for quality of care more favorably were less likely to have high burnout ($P < .05$) and job dissatisfaction ($P = .07$). Oncology nurses who rated nurse participation in hospital affairs favorably were less likely to intend to leave their current position ($P < .05$). Oncology nurses

with higher scores on the collegial nurse-physician relations subscale were less likely to report fair-to-poor quality of care ($P < .05$). In addition, oncology nurses who reported higher patient workloads were more likely to report poor-to-fair quality of care ($P < .05$).

Discussion

Our study provides a systematic examination of nurse work environments and outcomes for nurses working in oncology units and compares these findings with nurses working in medical-surgical units. Contrary to popular opinion, oncology nurses have lower burnout, less job dissatisfaction, and less intent to leave their current position than do medical-surgical nurses. We find that the more favorable outcomes for oncology nurses can largely be explained by better nurse work environments in oncology units. Our finding that favorable nurse work environments and nurse outcomes are reported by oncology nurses when compared with nononcology nurses is consistent with the theoretical framework of Aiken et al¹¹ and with previous studies conducted in specialty units such as AIDS-dedicated units⁴ and dialysis units.³³ More specifically, oncology nurses in our study reported more favorable staffing and resource adequacy, nurse foundations for quality of care, and collegial nurse-physician relations. Patients hospitalized in oncology units likely have complex medical conditions that require specialized knowledge and expertise from clinicians. To meet these needs, oncology units typically staff at lower patient-to-nurse ratios and provide special training programs for nurses to develop in-depth specialized knowledge and expertise. These actions can enhance nurse autonomy, improve their collaboration with physicians and other health-care providers, and further improve the nurse outcomes. Our finding of significantly more favorable nurse work environments for oncology nurses when compared with medical-surgical nurses resembles the trend observed in Friese's²² study using 1998 data. However, these differences were not statistically significant in the prior study, most likely because of sample size limitations. A power analysis shows that a sample

Table 3 • Logistic Models to Predict Nurse Outcomes With Categorical Nurse Practice Environments

	Oncology Nurses (n = 708), OR (95% CI)	Med-Surg Nurses (n = 835), OR (95% CI)
Emotional exhaustion		
PatsRN	1.03 (0.99–1.07)	1.03 (0.99–1.08)
Work environment (compared with unfavorable)		
Mixed	0.63 (0.39–1.00) ^a	0.99 (0.67–1.47)
Favorable	0.31 (0.19–0.51) ^d	0.50 (0.32–0.79) ^d
Job dissatisfaction		
PatsRN	1.01 (0.97–1.04)	1.09 (1.03–1.16) ^c
Work environment (compared with unfavorable)		
Mixed	0.62 (0.38–1.02) ^a	0.81 (0.53–1.23)
Favorable	0.24 (0.13–0.43) ^d	0.40 (0.23–0.68) ^c
Intent to leave		
PatsRN	1.04 (0.99–1.08) ^a	1.07 (1.02–1.12) ^c
Work environment (compared with unfavorable)		
Mixed	1.46 (0.76–2.80)	0.98 (0.57–1.66)
Favorable	0.51 (0.24–1.09)	0.57 (0.30–1.09) ^a
Poor or fair quality of care		
PatsRN	1.05 (1.01–1.09) ^b	1.08 (1.03–1.14) ^c
Work environment (compared with unfavorable)		
Mixed	0.51 (0.31–0.85) ^c	0.59 (0.37–0.96) ^b
Favorable	0.29 (0.16–0.51) ^d	0.32 (0.18–0.57) ^d

Abbreviations: CI, confidence interval; Med-Surg, medical-surgical; PatsRN, patient-to-registered nurse ratio; OR, odds ratio.

^a $P < .10$.

^b $P < .05$.

^c $P < .01$.

^d $P < .001$.

size of about 1000 for each group was needed to detect a 0.05 to 0.1 difference.⁷ In this study, we had a larger sample size (708 oncology nurses and 3339 nononcology nurses), with more power to detect significant differences, compared with 305 oncology nurses and 1651 nononcology nurses in Friese's²² study.

Our findings are consistent with previous studies that report an association between nurse work environments and nurse-reported outcomes. More specifically, our finding that collegial nurse-physician relations are associated with nurse reports of quality of care is consistent with previous research.²² Complex healthcare delivery requires collaboration among multiple disciplines. Nurses coordinate these disciplines throughout challenging care episodes. Collegial nurse-physician relations that lead to effective communication streamline care delivery and increase the likelihood for favorable patient outcomes. Moreover, when nurse-physician relationships are strained, care may suffer because of faulty communication practices, lack of trust, and failure to report signs of complications in a timely manner.³⁴

A robust research literature has linked poor nurse staffing to adverse outcomes.^{6,35,36} It is not surprising to find a significant relationship between higher nurse workloads and poor quality of care. Excessive workloads are system failures that can compromise the quality of patient care and occur in both specialty and general care areas.

Our study differs from others in that we found that favorable nursing foundations for quality of care are significantly associated with lower burnout and less job dissatisfaction, and nurse participation in hospital affairs is significantly related to nurses' intention to leave their current position. The subscale of nursing foundation for quality of care assesses practice environment features such as preceptor programs for newly hired nurses and active staff development or continuing education programs for nurses. These features are important for all nurses but are crucial for nurses who work in oncology units with complex patients and treatment regimens. Specialized knowledge is needed to ensure patient safety during and after the chemotherapy and radiation treatment. A nurse practice environment lacking these features cannot provide oncology nurses with knowledge and expertise that are required for their daily work. The absence of this support could induce stress and cause high burnout and job dissatisfaction. Therefore, serious considerations should be given to improve features identified in the nursing foundation for quality-of-care subscale. These include a preceptor program for new nurses, patient assignments that foster continuity, active in-service/continuing education programs, and an active quality improvement program. The nurse participation in hospital affairs subscale refers to nurse's involvement in hospital or department internal governance, policy decisions, and committees. By actively participating in the committees and internal governance, nurses can have direct and open communication with hospital administrators, making themselves visible and their voices heard. Nurses working in hospitals supporting nurse participation in hospital affairs have more opportunities for self-development and therefore are less likely to leave their current position.

While recognizing the strengths of a large sample size and controlling for important covariates, we acknowledge several study limitations. First, the cross-sectional nature of our study limits our ability to determine causality. Longitudinal studies that use structural equation modeling are needed in future studies to examine causal relationships between work environment factors and outcomes. A second limitation is the reliance on nurse-reported measures of outcomes. Even though nurses are reliable informants historically,^{11,37,38} future objective outcome measures would improve validity.

■ Conclusions

Oncology nurses report more favorable nurse practice environments and outcomes than do medical-surgical nurses. This aligns with theoretical hypothesis that specialized nursing units enhance clinical autonomy, control over practice, and relations with physicians that result in improved outcomes. The significant relationship between nurse work environments and outcomes echoed the IOM's call for transforming nurse work environments to improve patient safety and hospital quality of care.³⁹ To improve outcomes and reduce nurse turnover on oncology units, hospitals should consider using effective preceptor programs, continuing education programs, and strategies that strengthen nurses' participation in hospital decision making.

■ Relevance to Practice

This study provides evidence on how to improve nursing outcomes. Our study results suggest that nursing outcomes and quality of care can be improved by improving nurse work environments. Favorable collaborative relationship between nurses and physicians is essential to a good patient care as well as to job satisfaction. A robust preceptor system and in-service education program can support oncology nurses—especially new nurses—to adapt to their working environment and thus reduce emotional exhaustion.

In the context of a future nationwide nursing shortage, it is critical for hospitals to strengthen nurse work environments that both attract new nurses and retain existing nurses. Nurse participation in hospital affairs is significantly associated with oncology nurses' intent to leave their current position. Strategies including a prominent and well-regarded chief nurse executive, nurse involvement in committees, and empowering nurses to contribute to important institutional decisions will enhance nurse autonomy and may reduce the nurse turnover.

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