Nursing Practice Environments and Job Outcomes in Ambulatory Oncology Settings

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Abstract

Objective—To investigate job satisfaction and intention to stay for ambulatory oncology nurses.

Background—An oncology provider shortage suggests retention is a high priority, and factors associated with job outcomes are unknown in this setting.

Method—Data derived from a cross-sectional survey completed by 402 oncology nurses employed in ambulatory settings. Logistic regression models estimated the likelihood of job satisfaction or intention to stay for at least one year.

Results—Most nurses (80.9%) were satisfied and 87.4% indicated their intention to stay. Significant variables for job satisfaction were university/hospital ownership, staffing and resource adequacy, nurse manager ability and leadership, and workloads. Variables significant for intention to stay were staffing and resource adequacy, participation in practice affairs, and years of experience. Medical assistant support was associated with lower intention to stay.

Conclusions—Favorable practice environments are key to effective retention. Staff skill mix in ambulatory oncology settings warrant further examination.

The Institute of Medicine (IOM) report *The Future of Nursing: Leading Change, Advancing Health* (1) provides an evidence-based imperative to transform existing health care delivery systems to improve patient outcomes. Key to this transformation is leadership from nurses to redesign health care delivery. The care delivery system for patients with cancer is a high-priority area for redesign, given the increasing numbers of cases, the complexity of the disease state, and the toxicity of prescribed treatments. And while the majority of chemotherapy care is delivered in ambulatory settings, little is known about the quality of care delivered (2). The importance of favorable nursing practice environments (PEs) on outcomes for hospitalized patients has been well documented (3–7). Evidence focused on the PEs of ambulatory settings is almost non-existent.

Nurses are the single largest group of providers in oncology settings (8). They serve as a focal point for toxicity prevention and management, crucial components to high-quality cancer care. Despite the desire to deliver optimal care, ambulatory settings face many barriers to implement evidence-based practices. Barriers include the professional environment for nursing practice, defined as, the elements of the workplace that promote safe, effective nursing care and nursing workloads, which reflect the number of patients nurses care for on a daily basis. A 2011 report identified significantly increased occupational exposure to chemotherapy when nurses practiced in unfavorable environments, had higher

daily workloads, and reported lower guideline adherence. (9). The IOM committee on the work environment for nurses and patient safety summarized in their volume following *Keeping Patients Safe* that "it is not just necessary, but also possible, to transform the work environment of today's nurses." (6;p.49). The context in which providers deliver care is as crucial to patient outcomes in ambulatory oncology settings, yet has not received systematic study.

Conceptual Framework

The Practice Environments of Oncology Nurses Study (PEONS) was informed by the seminal conceptual work of Donabedian (10), who suggested that quality of health care could be assessed in 3 components: structure, process, and outcome. A thematic analysis of focus group data obtained by a separate sample of nurses employed in ambulatory oncology settings posited a relationship between PEs and nursing job satisfaction (11). Specifically, workloads, management support, the quality of medical assistant support, and physical resources were suggested to influence job satisfaction. Informed by this prior work, the current study sought to investigate empirically the relationship between nursing PEs and job outcomes for nurses employed in ambulatory oncology settings. The primary hypothesis was that more favorable PEs would be associated with significantly increased likelihood of nurse-reported job satisfaction and intention to stay.

Methods

Setting, Participants, and Study Procedures

The protocol received human subjects approval by our university's institutional review board. The study took place in one large state in the Southeastern United States and the survey was administered between April and June, 2010. 1,339 nurses were identified through the state's board of nursing database. These registered nurses (RNs) and licensed practice nurses (LPNs) were selected for inclusion because they reported on their licensure renewal that they practiced in oncology nursing outside of hospital inpatient units. Participants were invited to complete either a paper or Web-based questionnaire; both questionnaires had identical content. Non-significant differences in participation rates by mode of survey completion have been reported previously (12). After an introductory letter was mailed, participants received a $2 incentive with their 1st survey packet, which included a study description, questionnaire and/or instructions to complete the questionnaire online, and a return envelope. Following a modified protocol recommended by Dillman and colleagues (13), reminders were sent at 10-day intervals. All mailings used 1st-class mail.

Measures

The data source for this study was a questionnaire administered to nurses in ambulatory oncology settings (AOS). The research team prepared a 12-page questionnaire for nurses employed in AOSs. The questionnaire included items that captured demographic and practice characteristics, perceived PEs, and an array of outcomes, which included job satisfaction and intention to stay in current position. For job satisfaction, nurses were asked to complete the question, "How satisfied are you with your current position," with 1 of 5 answer choices: very dissatisfied, dissatisfied, neither dissatisfied nor satisfied, satisfied, or very satisfied. The analyses presented below dichotomized the job satisfaction outcome to reflect that participants reported being satisfied or very satisfied with their current position. To measure job retention, nurses were asked, "Do you intent to stay in your current position?" Possible answer choices included a plan to leave within 6 months, a plan to leave within 1 year, or they have no plans to leave. The analyses below used a dichotomous outcome of whether the respondent did not plan to leave within 1 year.

The independent variables were included after considering our conceptual model and variables significantly associated with nurse job outcomes in previous studies (11, 14). They included nurse demographics: race (white versus non-white), certification (holds oncology certification versus does not hold certification), education (holds at least a bachelors degree versus holds less than a bachelors degree), and years of experience; and practice ownership (hospital- or university- owned versus private practice or other ownership arrangement).

Nursing workloads and perceived nursing PEs were 2 important variables for consideration. To measure nursing workloads, we asked nurses to report the number of patients they provided the majority of direct care for on their last shift. To measure PEs, we asked nurses to complete a revised set of items that derive from the Practice Environment Scale of the Nursing Work Index (PES-NWI) (15). The PES-NWI includes 31 items across 5 subscales reflecting the degree to which nurses agree characteristics that exemplify professional environments are present. The modifications made for this study have been reported previously (16). First, all items were scaled on a 5-point Likert scale with the inclusion of a neutral category, as opposed to the original 4-point scale (strongly disagree, disagree, agree, or strongly agree the characteristic is present in their current job). In addition to item reduction, a 6th subscale – medical assistant support - was added. The final revised scale included 23 items across 6 subscales: staffing and resource adequacy (cronbach's alpha 0.89), nursing foundations for quality of care (0.80), nurse participation in practice affairs (0.86), nurse manager leadership, ability, and support of nurses (0.90), collegial nurse-physician relations (0.86), and medical assistant support (0.87). In addition to the subscale reliability reported above, validity was confirmed using a structural equation model with acceptable fit, as shown by a comparative fit index of 0.95, and a root mean square error of approximation of 0.057 (16). For modeling purposes, these revised subscales were dichotomized to reflect whether nurse respondents scored them above the midpoint of 3.0, which would indicate that the nurse agreed the characteristic was present in the workplace. For each revised PES-NWI subscale, the referent category was a score below the theoretical midpoint on the subscale items.

Data Analysis

First, we examined bivariate relationships between nursing job satisfaction and study variables, including the revised PES-NWI subscales, nurses' reported workloads, and demographic characteristics. These analyses were repeated with nurses' intention to remain in their position at least 1 year as the 2nd dependent variable. Student's t-test and chi-square test statistics were used for continuous and categorical variables, respectively.

Next, 2 logistic regression models were estimated for both dependent variables of job satisfaction and intention to stay in current position. For each fully-adjusted model, all study variables of interest were included (practice ownership, revised PES-NWI subscales above the theoretical midpoint, demographic characteristics, workload on last shift, and years of nursing experience). The parsimonious models for both job outcomes include only those variables significant at $p < .15$ after specifying a backward selection process. All 4 models reported specified a generalized estimating equation to adjust standard errors for the clustering of nurses within practices. Analyses were performed in SAS 9.1.3™ (Cary, North Carolina).

Results

Of the 1,339 potential participants, 402 nurses responded to the survey (30.0% response rate), with minimal demographic differences observed between respondents and non-respondents (16). Two-hundred forty-two nurses had requisite data for analyses; they were employed by 106 practices. 67 % of these nurses worked in hospital or university-affiliated

practices. Ninety-one percent were white, 74 % reported oncology certification, and 46 % reported holding a bachelor's or higher degree. The majority (95%) of respondents were RNs and the remainder were LPNs.

Job Satisfaction

One hundred ninety (80.9%) of respondents indicated they were satisfied or very satisfied with their current position. Compared with non-satisfied nurses (n = 45, 19.1%), satisfied oncology nurses reported higher scores on the revised PES-NWI subscales (Table 1). Scores differed the most on the staffing and resource adequacy subscale (3.73 for satisfied nurses versus 2.58 for dissatisfied nurses, $p < .001$). All subscales differed significantly at $p < .01$, with the exception of the difference in the medical assistant support scale. On the global assessment of the PE, the overwhelming majority of satisfied nurses reported favorable PEs (87.8% vs 12.2%, $p < .001$). The majority of dissatisfied nurses reported unfavorable or mixed PEs (67.4% vs. 32.6%, $p < .001$). Satisfied nurses reported significantly lower workloads on their last shift (8.29 patients versus 11.77 patients for dissatisfied nurses, $p < .01$). Job satisfaction did not differ by race, oncology certification, education, or years in practice.

Intention to Stay in Current Position for 12 Months or Longer

The majority of nurse respondents (n=208, 87.4%) indicated they intend to stay in their current position for 12 or more months, compared with 30 nurses (12.6%) who reported intent to leave in > a year. Table 1 Compared with the results on job satisfaction, fewer subscales on the revised PES-NWI differed significantly by nurses' intention to stay (Table 1). Nurse participation in practice affairs, nurse manager leadership, ability, and support, and staffing and resource adequacy were significantly higher for nurses who intend to stay in their position. Once again, the staffing and resource adequacy subscale had the largest difference between groups (3.61 versus 2.70, $p < .001$). Perceived medical assistant support was higher in nurses who did not intend to stay for 1 year (3.80 versus 3.57), but the difference was not statistically significant. While workloads were lower for nurses who intend to stay (8.76 versus 10.18), the difference was not significant. White nurses, oncology certified nurses, and nurses with more years of practice reported intention to stay more frequently than their counterparts (all $p < .05$).

Multivariable Results on Job Outcomes

Results from 4 multivariable logistic regression models are displayed in Table 2. Two models are shown for each outcome: job satisfaction and intent to stay. The fully adjusted models use all study variables displayed in the table and parsimonious models use variables with reported odds ratios and 95% confidence intervals. Variables were removed from these models using stepwise backwards selection with a cutpoint of $p > .15$. All 4 models were adjusted for nurse clustering in practices using generalized estimating equations. Across all 4 models displayed, the strongest and most significant variable for the 2 job outcomes was staffing and resource adequacy. When nurses reported above the midpoint on the revised staffing and adequacy subscale from the PES-NWI, they were significantly more likely to report they were satisfied or very satisfied with their current position. They were also significantly more likely to report they intend to stay in the current position for at least 1 year. Related to staffing and resource adequacy, nurses who reported higher workloads were significantly less likely to report job satisfaction, Odds Ratio (OR) 0.92, 95% CI [.85, 1.00]. Nurses employed in practices owned by universities or hospitals were more likely to be satisfied in contrast to nurses employed in physician-owned or other private practice settings. Finally, nurses who reported above the midpoint on the revised nurse manager, leadership, and ability subscale were more likely to report job satisfaction.

In addition to staffing and resource adequacy, 2 subscales were significantly associated with an increased likelihood to report intention to stay in the parsimonious model. Nurses who scored above the midpoint on the nurse participation in practice affairs were significantly more likely to report intention to stay, OR 3.08, 95% CI [1.01, 9.42]. Nurses who reported above the midpoint on the medical assistant support scale were less likely to report intention to stay, OR 0.21, 95% CI [.06, .72]. Finally, more years of nursing experience was significantly associated with an increased likelihood in intent to stay in both fully adjusted and parsimonious models.

Discussion

Motivated by a surge in demand for cancer services in ambulatory oncology and a predicted shortage in oncology nurses, this study examined 2 nurse job outcomes: satisfaction and intention to stay in current position for at least one year. A noteworthy number of nurses surveyed are not satisfied with their current position and are likely to leave their position. These findings highlight available opportunities to strengthen nursing PEs in ambulatory oncology settings to improve satisfaction and retention. The most noteworthy finding is that nurse-reported staffing and resource adequacy is significantly associated with both job satisfaction and intention to stay, which is consistent with the study's conceptual model and proposed primary hypothesis. Interestingly, only 1 model identified a relationship between the number of patients cared for and job satisfaction. This suggests that nurses are comfortable with their patient assignments, but feel that personnel and resources could be deployed more thoughtfully to support the unpredictable demands of daily practice. The finding of a strong and significant relationship between perceived nurse manager quality and job satisfaction is consistent with previous studies conducted in inpatient settings (16). Higher satisfaction in university- or hospital- owned practices suggests these environments may promote professional practice and autonomy, as opposed to traditional, physician-owned private practice.

In addition to staffing and resource adequacy, stronger nurse participation in practice affairs is associated positively with intention to stay. When nurses are able to contribute to practice decision making, including policy development and equipment selection, they are likely to have a stronger connection to their work setting, thus promoting retention. The curious negative relationship between medical assistant support and intention to stay may reflect variations in skill mix in practices. It is possible that nurses who reported lower on this scale have fewer layers of clinical staff, thus enhancing autonomy and promoting retention. Skill mix in ambulatory oncology settings has not received systematic study and these findings may stimulate additional research in this area. Finally, practices should be encouraged that their most experienced nurses are more likely to stay, but retention of less-experienced nurses should be an administrative priority.

Study Limitations

The present study has several limitations worthy of additional discussion. First, while the response rate from surveyed nurses is 30.0%, previously-published results suggest minimal, non-significant differences in demographic characteristics between respondents and non-respondents (17). However, the possibility of differing perceptions on studied variables in non-responders cannot be excluded. Second, this report is informed solely by surveyed nurse informants without the verification of actual turnover in the practices. Historically, intention to leave is strongly associated with actual job termination (14). Finally, the number of respondents did not permit a multi-level modeling approach. Instead, models were adjusted for clustering using generalized estimating equations. These limitations are presented alongside one of the largest published studies to date that focus on PEs in the high-risk, high-volume ambulatory oncology setting, where nurses deliver the majority of care.

Implications for Practice, Policy, and Leadership

The study results address directly 2 prominent policy statements by the IOM report on nursing and the National Cancer Policy Board workshop on the oncology workforce (2, 8). To optimize care for patients receiving chemotherapy, retention of existing oncology nurses is a top priority. To promote job satisfaction and retention, staffing and resources must be adequate to meet daily patient care responsibilities. Because of the unpredictable nature of ambulatory patient care and the absence of national benchmarks, additional research is needed to elucidate how to develop and staff ambulatory oncology settings to optimize patient outcomes. Currently, managers can assess workloads from staff and implement changes to improve the efficiency of personnel deployment to meet patient care needs. To increase nurse participation in practice affairs, managers and physicians can establish advisory councils to review policies, procedures, and equipment selection. Practice administrators should recognize the importance of strong nursing leadership on front-line staff satisfaction, and provide the necessary training and support to managers who supervise clinical areas. Taken together, these strategies that derive from empirical findings are likely to retain oncology nurses and minimize the impact of turnover on the pressing shortage of oncology providers.

Acknowledgments

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Table 1

Bivariate Relationships for Oncology Nursing Job Outcomes.

	Intent to stay in current position for one year			Satisfied or very satisfied with current position		
	Yes n = 208	No n = 30	p	Yes n = 190	No n = 45	p
	Mean (SD)[a]					
Revised PES-NWI subscales						
Staffing and resource adequacy	3.61(0.89)	2.70(1.08)	<.001	3.73 (0.80)	2.58 (1.02)	<.001
Nursing foundations for quality	4.17(0.58)	3.97(0.59)	.10	4.21 (0.58)	3.89 (0.55)	<.01
Medical assistant support	3.57(1.02)	3.80(0.93)	.26	3.65 (1.00)	3.45 (1.09)	.27
Nurse participation in practice affairs	3.17(0.76)	2.48(0.87)	<.001	3.25 (0.73)	2.45 (0.79)	<.001
Nurse manager ability, leadership, and support	3.59(0.87)	3.10(1.10)	<.01	3.69 (0.83)	2.87 (0.99)	<.001
Collegial nurse-physician relations	4.02(0.71)	3.81(0.73)	.15	4.08 (0.68)	3.77 (0.72)	<.01
Number of patients cared for on last shift	8.76(6.31)	10.18(4.65)	.31	8.29 (5.75)	11.77(7.29)	<.01
Years of nursing experience	22.2 (10.2)	15.8 (11.2)	<.01	21.6 (10.1)	21.0 (12.0)	.77
				n (%)[b]		
Perception of the nursing practice environment						
Unfavorable or mixed environment	44 (22.6)	17 (60.7)	<.001	23 (12.2)	29 (67.4)	<.001
Favorable environment	151 (77.4)	11 (39.2)		165 (87.8)	14 (32.6)	
Non-white race	15 (7.2)	6 (20.0)	.04	17 (8.9)	4 (8.9)	1.0[c]
White race	192 (92.8)	24 (80.0)		172 (91.1)	41 (91.1)	
Does not hold oncology nurse certification	50 (24.0)	13 (43.3)		47 (24.7)	16 (35.6)	.14
Holds oncology nurse certification	158 (76.0)	17 (56.7)		143 (75.3)	29 (64.4)	
Holds less than a bachelors degree	111 (53.4)	18 (60.0)	.49	101 (53.2)	27 (60.0)	.41
Holds a bachelors degree or higher	97 (46.6)	12 (40.0)		89 (46.8)	18 (40.0)	

Note. PES-NWI = Practice Environment Scale of the Nursing Work Index.

[a] Differences tested using two sample t-tests.

[b] Differences tested using chi-square test of independence.

[c] Differences compares using Fisher's exact test due to small sample sizes.

Table 2

Multivariable Logistic Regression Models for Oncology Nursing Job Outcomes

	Intent to stay in current position for one year				Satisfied or very satisfied with current position			
	Fully adjusted[a] n=173		Parsimonious[b] n=179		Fully adjusted[a] n=171		Parsimonious[b] n=182	
				Odds Ratio 95% CI				
University or hospital owned	2.35	0.97, 5.69	-	-	4.36	0.98, 19.35	3.63	1.08–12.28 *
Staffing and resource adequacy[c]	7.86	2.38, 25.95 *	8.05	2.50, 25.95 *	16.05	5.63, 45.8 *	12.94	5.09, 32.92 *
Nursing foundations for quality[c]	2.55	0.31, 20.66	-	-	2.53	0.27, 23.36	-	-
Medical assistant support[c]	0.26	0.05, 1.29	0.21	0.06, 0.72 *	0.52	0.15, 1.79	-	-
Nurse participation in practice affairs[c]	2.19	0.57, 8.42	3.08	1.01, 9.42 *	1.56	0.35, 6.93	-	-
Nurse manager ability, leadership, and support[c]	1.46	0.28, 7.63	-	-	2.64	0.66, 10.64	3.17	1.02, 9.85 *
Collegial nurse-physician relations[c]	0.60	0.09, 4.01	-	-	3.05	0.71, 13.00	3.37	0.97, 11.71
White (compared to non-white)	2.40	0.47, 12.34	1.85	0.31, 11.11	0.57	0.13, 2.58	0.69	0.15, 3.25
Holds oncology nurse certification	2.09	0.70, 6.23	1.83	0.66, 5.13	1.70	0.62, 4.71	1.85	0.74, 4.63
Holds a bachelors degree or higher	0.33	0.10, 1.10	0.52	0.19, 1.42	0.34	0.12, 0.94	0.48	0.19, 1.19
Number of patients cared for on last shift	0.99	0.91, 1.07	0.97	0.91, 1.04	0.92	0.85, 1.01	0.92	0.85, 1.00 *
Years of nursing experience	1.06	1.0, 1.13 *	1.10	1.02, 1.18 *	0.98	0.92, 1.04	0.96	0.91, 1.02

Note. CI = Confidence Interval.

[a]Fully adjusted models include all variables listed and are adjusted for clustering using generalized estimating equations.

[b]Parsimonious models include variables significant at $p < .15$ using stepwise backwards selection. The models are adjusted for clustering using generalized estimating equations.

[c]Referent group is nurses who reported below the midpoint of the subscale.

*
$p < .05$.