

Factors influencing job satisfaction of oncology nurses over time

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Abstract

In this study, we tested a structural equation model to examine work environment factors related to changes in job satisfaction of oncology nurses between 2004 and 2006. Relational leadership and good physician/nurse relationships consistently influenced perceptions of enough RNs to provide quality care, and freedom to make patient care decisions, which, in turn, directly influenced nurses' job satisfaction over time. Supervisor support in resolving conflict and the ability to influence patient care outcomes were significant influences on job satisfaction in 2004, whereas, in 2006, a clear philosophy of nursing had a greater significant influence. Several factors that influence job satisfaction of oncology nurses in Canada have changed over time, which may reflect changes in work environments and work life. These findings suggest opportunities to modify work conditions that could improve nurses' job satisfaction and work life.

Key words: job satisfaction, oncology nursing, physician-nurse relationships, structural equation modelling

Oncology nursing work environments are fraught with many challenges and workforce issues that have also been reported by nurses in other practice settings. The international nature of nursing shortages and their related predictors, such as job stress and intent to leave, are emphasized in the literature (Finlayson et al., 2007). For example, given nurses' increasing average age (45.1 in 2008) and retirements, the predicted shortage of 60,000 nurses in Canada by 2022 threatens to impact patient care and the delivery of health care (Canadian Institute for Health Information [CIHI], 2010; Canadian Nurses Association, 2009). One strategy to address the nursing shortage is to examine ways to retain current nurses (Salt et al., 2008). Dissatisfaction of nurses has been linked to an increase in absenteeism in nursing populations (CIHI, 2008). In a systematic review of factors influencing nurse absenteeism, positive work attitudes (including increased job satisfaction) were related to reduced absenteeism, whereas job stress was linked to higher absenteeism among hospital nurses studied worldwide (Davey et al., 2009).

Much has been written about nursing work environments and the many factors that impact nurses' job satisfaction. However, there is little research about factors associated with nurses' job satisfaction in specialized nursing environments, such as oncology care settings. The work presented in this paper is part of a larger study designed to address this gap in knowledge for oncology work environments. The purpose of this study was to test a theoretical model of work environment factors related to oncology nurses' job satisfaction, and to assess changes in these factors and job satisfaction levels over a two-year period using structural equation modelling.

Literature review

Oncology work environments

Much of the literature on nurse work environments and job satisfaction pertains to general nursing contexts. More needs to be known about specific nursing work environments to better understand what influences nurses' perceptions of their contexts and the effects of these factors on patient outcomes (Utriainen & Kyngas, 2009). The Canadian Association of Nurses in Oncology (CANO) reports "oncology nursing is specialty practice. Additional knowledge and cognitive and clinical skills must support this practice" (2010, p.9). Literature exploring oncology nursing work environments highlights differences compared to non-oncology work environments, the link to patient outcomes and other factors impacting job satisfaction of nurses working in oncology.

Oncology nurses report significantly higher ratings related to nurse-physician relations compared to non-oncology nurse participants (Friese, 2005). Higher quality care was subsequently linked to work environments that identified more collegial nurse-physician relationships (Friese, 2005). Other predictors of job dissatisfaction in oncology nursing work environments include decreased managerial support of nurses and inadequate staffing/resources (Friese, 2005). The uniqueness of oncology nursing environments and specialty-specific experiences of oncology nurses has been identified by van Rooyen and colleagues (2008). In a recent integrative review of the literature describing the context of oncology nursing, uniqueness was attributed to the dynamic and complex nature of cancer control, and nurses' personal growth from the intense therapeutic relationships established with cancer patients and their families (Bakker et al., 2013). Given the distinctive nature of oncology nursing and an increased demand for care in this area, as cancer incidence rises in society (Union for International Cancer Control, n.d.), studies that examine how oncology work environments affect nurses' job satisfaction could aid in the recruitment and retention of oncology nurses.

Links among context, job satisfaction and patient care outcomes

The link between nurses' job satisfaction and patient care outcomes has been prominently reported (Aiken et al., 2002, Aiken et al., 2003). In an examination of patient care outcomes in surgical oncology settings, work environments characterized by decreased staffing and as less than favourable by nurses, recorded higher mortality rates among patients (Friese et al., 2008). Negative work environments were also associated with more frequent patient complications and a decrease in quality of nursing care (Friese et al., 2008). Higher nurse education levels, richer nurse skill mix, a higher proportion of casual or temporary positions, and better nurse-physician relationships all contributed to significantly reduced mortality among medical patients in general nursing work environments studied (Estabrooks et al., 2005). In a recent systematic literature review, nursing leadership styles that focused on relationships with nurses were found to be significantly related to better outcomes for nurses and their work environments compared to task focused leadership styles, which were linked to negative outcomes (Cummings et al., 2010a). In another review, relational leadership practices were significantly linked to nurses' intentions to stay in their jobs (Cowden, Cummings & Profetto-McGrath, 2011). Subsequently, relationally focused leadership styles of hospital nursing leaders were reported to significantly contribute to reducing patient mortality in a study of 90 hospitals (Cummings et al., 2010b).

Important linkages have also been established between various work environment factors within oncology-specific settings and job satisfaction. Martensson et al. (2010) identified an association between cancer nurses' satisfaction with work, increased

years of experience and a less intense workload. Specifically, when experienced cancer care nurses perceived their workload to be very heavy, they were less satisfied with their work. The importance of context in nurses' job satisfaction in the presence of nursing shortages has also been discussed in the literature (Morgan, & Lynn, 2009). Context is an important consideration when identifying factors that result in increased job satisfaction and a positive nursing work environment (Bakker et al., 2011). These factors, including patient-centred care, autonomy, and professional pride, appear to be critical in oncology nursing (Morgan & Lynn, 2009). Unique aspects of oncology nursing include a strong multidisciplinary focus, as well as intense and intricate relationships with colleagues, team members, patients, and families. As well, oncology nurses reported increased stress associated with death and dying, a common occurrence in oncology care settings (van Rooyen et al., 2008).

In previously published literature from this prospective study of Canadian oncology nurses and their work environments, we reported findings that form the foundation for continued examination of subsequent data. First, findings of the initial survey of oncology nurses in 2004 revealed that relational leadership and physician/nurse relationships significantly influenced the quality of oncology nursing work environments and the job satisfaction of nurses in those areas (Bakker et al., 2010a; Cummings et al., 2008). Second, our focus group participants highlighted a spectrum of elements needed to create a positive work environment that they thought could increase recruitment and retention of nurses (Bakker et al., 2010b). These elements included a thorough orientation to meet the diverse needs of a dynamic demographic of oncology nurses and continued mentorship responsive to different phases in each nurse's career. As well, this study showed that a strong visible leader who acknowledged the specialized nature of oncology nursing was important to nurses' job satisfaction (Bakker et al., 2010b). Third, we documented the overall significance of the nurses' relationships with health team members and patients, and the resultant effect on their job satisfaction (Bakker et al., 2011). Other important findings from that study were the limited opportunities for oncology nurses to participate in policy decisions, decreased visibility of accessible, responsive, nursing leaders, and insufficient number of RNs available in oncology settings to provide quality care (Bakker et al., 2010a, 2011). In this paper, we highlight stability in some predictors of job satisfaction and changes in others over time through model testing, and present implications for nursing leadership, practice and research.

Methods

Study design

Using a prospective descriptive research design, we surveyed oncology nurses across Canada about their work environments and their professional practice on two occasions within the three-year study period (2004 and 2006). In this paper, we tested a theoretical model of the relationships between work environment factors and nurses' job satisfaction using the data from 2004 and 2006.

Recruitment and sample

In 2004, we recruited full-time and part-time registered nurses in Canada who provided direct care to cancer patients in settings such as hospital in-patient oncology units, ambulatory cancer clinics, community care, palliative care and home care for the national survey, as a convenience sample. Questionnaires were mailed to members of the Canadian Association of Nurses in Oncology (CANO), the Association québécoise des infirmières en oncologie (AQIO), and to nurses employed by provincial cancer care agencies and hospitals in Ontario, Quebec, Nova Scotia, and Alberta. We also invited nurses through the *Canadian Oncology Nursing Journal*. In 2004,

we received 615 valid responses, and 525 of these nurses provided consent to be contacted again in 2006. Three hundred ninety seven completed the second survey. Further details on recruitment procedures are published elsewhere (Bakker et al., 2010a).

Data collection/measures

Following receipt of ethical approval from each research member's affiliated institution(s), data were collected at Time 1 and Time 2 using a self-report English questionnaire distributed by postal mail. The questionnaires contained three sections—demographics, work environment characteristics, and questions related to the nursing role, job satisfaction, and intent to leave. Survey details were previously published (Bakker et al., 2010a) and summarized here. Demographic questions included age, years in nursing, years of oncology nursing experience, nursing education, and type of work setting. Work environment characteristics were measured by a subset of 14 items from the Nursing Work Index-Revised (NWI-R) (Aiken & Patrician, 2000), a tool designed to measure aspects of the environment where nurses work. A decision to use select questions from the NWI-R was made based on previous research, which identified key elements that were meaningful to oncology nursing practice, job satisfaction and retention (Bakker et al., 2006). By reducing the numbers of items in the survey, participant burden was reduced, and we had hoped this strategy would increase the response rate. Participants were asked to report their level of agreement to statements about the presence of each characteristic in their work environment using a four-point Likert scale ranging from “strongly agree” to “strongly disagree”. The NWI-R was found to be valid and reliable in several other nursing samples (Lake, 2002; Li et al., 2007; Slater & McCormack, 2007). Job features included questions related to job satisfaction, perception of nursing practice and quality of care, and intention to leave their current job. As the purpose of the prospective research design was to collect information from the same nurses over time, the items on the second questionnaire were identical to those on the initial survey with additional questions seeking information related to nursing career decisions and reasons for changes made.

Theoretical/conceptual model

For this paper, we began with the same theoretical model that we had developed and tested as a structural equation model on the Time 1 data (Cummings et al., 2008). The relationships among the concepts in our model were based on our knowledge and experience, as oncology nurses and researchers, our previous research (Bakker et al., 2010a, 2010b) and other findings in the research literature. The background variables in our model were *relational leadership, visible nursing leadership, nurse managers who consult with staff, physician/nurse relationships, clear philosophy of nursing, age and gender*. Job satisfaction was the outcome variable. Intervening variables between the background variables and job satisfaction were *staff development programs, enough RNs to provide quality care, participation in policy decisions, freedom to make important patient care decisions, support for innovative ideas, supervisor support in resolving conflicts, and ability to influence patient care outcomes*. Each indicator or item on the survey measured a single identified latent concept (Hayduk & Littvay, 2012). Each variable was allotted a percentage of measurement error based on how closely the research team determined that each indicator measured its concept in the model (Hayduk, 1987). Measurement error may result from factors such as lack of clarity in the wording of some items. See Supplementary Table A for measurement error percentages and survey items. We allowed the background variables to co-vary in our model, because our intent was not to define their sources of variation. None of the variables were collinear. See Supplementary Table B for covariance and correlations among the model concepts at both Time 1 and Time 2.

Demographic characteristics	Frequency (n)	Percent %
Age (n)	338	
Less than or equal to 30 yrs	22	6.5
31-45 years	108	32.0
Greater than 45 yrs	207	61.2
Missing	1	0.3
Gender (n)	338	
Male	9	2.7
Female	329	97.3
Missing	0	0
Language (n)	338	
English	271	80.1
French	67	19.9
Missing	0	0
Region (n)	338	
West	83	24.5
Ontario	131	38.8
Quebec	89	26.3
Atlantic	34	10.1
Yukon	1	0.3
Missing	0	0
Employment Status (n)	338	
Fulltime	247	73.1
Part-time	91	26.9
Missing	0	0
Nursing Education (n)	338	
Diploma	159	47.2
Baccalaureate	140	41.5
Master's	38	11.3
Missing	0	0
CNA Oncology Certification (n)	338	
	163	48.5
Years of Nursing Experience (n)	338	
Greater than or equal to 26 years	185	54.7
16-25 years	89	26.3
6-15 years	47	13.9
Less than or equal to 5 years	11	3.3
Missing	6	1.8
Years of Experience in Oncology Nursing (n)	338	
Greater than or equal to 26 years	22	6.5
16-25 years	87	25.7
6-15 years	148	43.8
Less than or equal to 5 years	77	22.8
Missing	4	1.2
Cancer Workload (n)	338	
80-100% of time	295	87.3
60-80% of time	43	12.7
Missing	0	0
Work Setting	338	
Ambulatory Care/Clinic	207	61.2
Inpatient Unit/Hospital	104	30.8
Home Care/Community	19	5.6
Other	8	2.4

*Based on matched data of 2004 and 2006 with reference base of 2004 data.

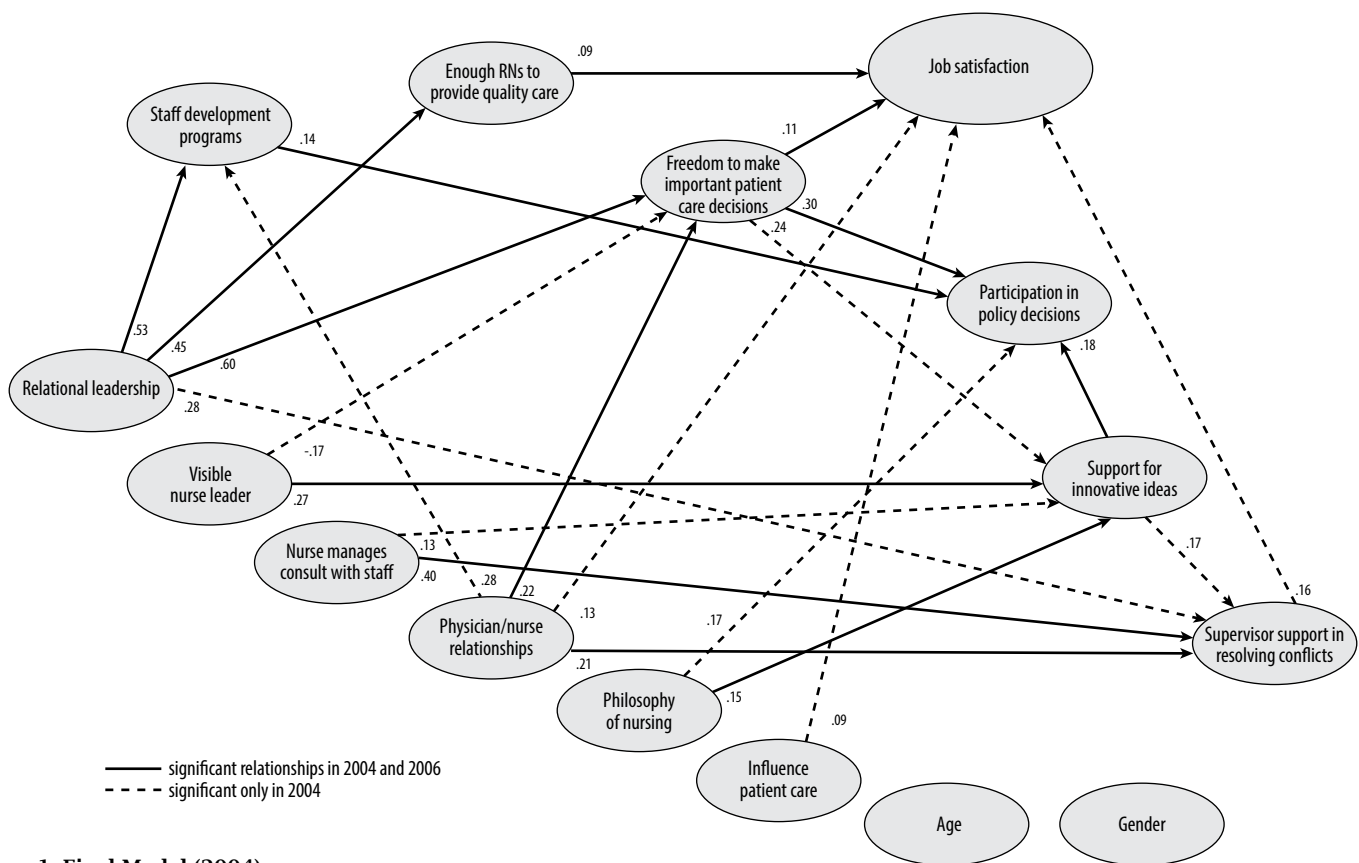


Figure 1: Final Model (2004)

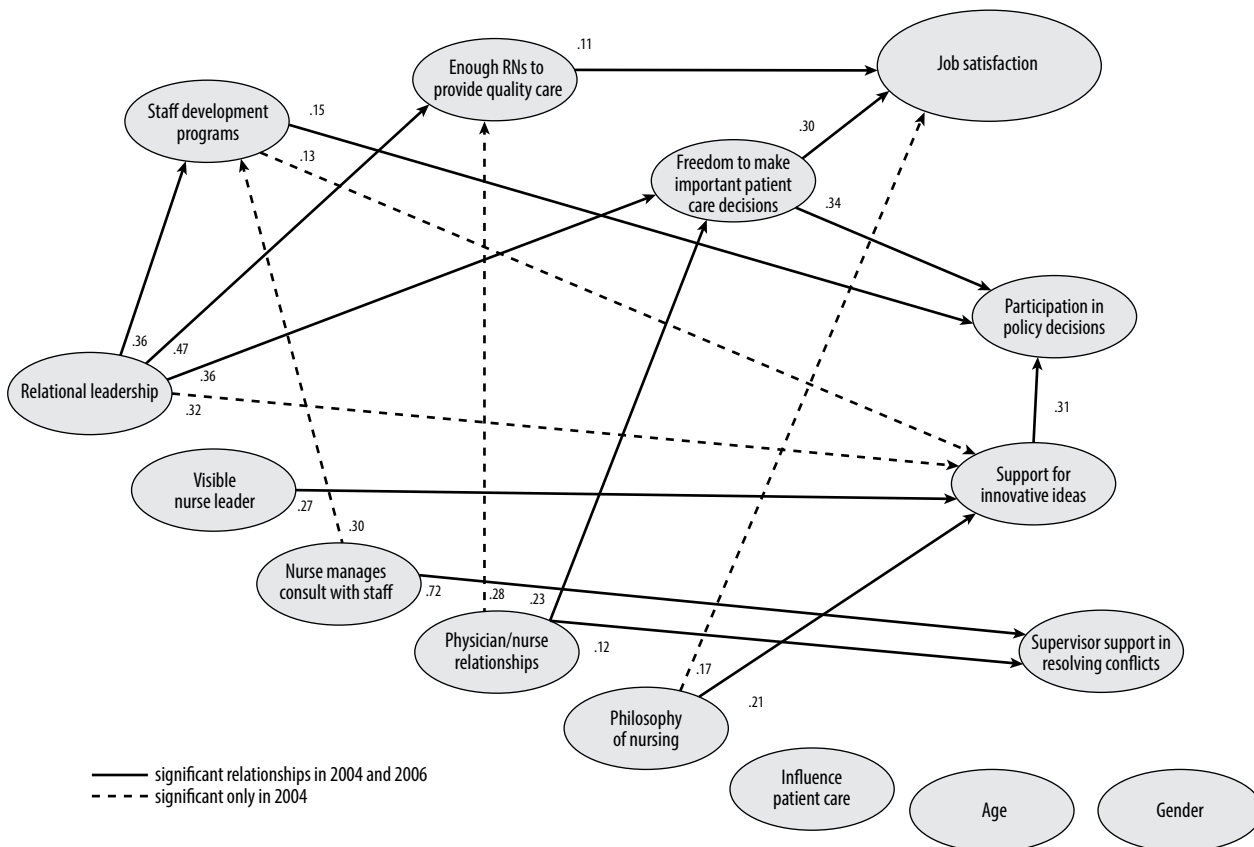


Figure 2: Final Model (2006)

Table 2: Estimated effects in final models for 2004 and 2006

Background variables ∞															
Intervening variables	Staff Development	Enough nurses	Policy	Freedom	Ideas	Support in resolving conflict	Relational Leadership	Visible nursing leadership	Nurse managers consult with staff	Physician/Nurse relationships	Philosophy of Nursing	Influence patient care	Age	Gender	Squared Multiple Correlations †
Staff Development							.53*		.05	.28*					.32
							.36*		.30*	.09					.35
Enough nurses							.45*			.11					.17
							.47*			.28*					.25
Policy	.14*			.31*	.18*		.06	.04			.17*				.44
	.15*			.34*	.31*		.18	-.05			-.06				.46
Freedom							.60*	-.17*		.22*	.12				.43
							.36*	.08		.23*	.12				.35
Ideas	.05			.24*			.04	.27*	.13*	.06	.15*				.57
	.13*			.09			.32*	.14*	-.03	.04	.21*				.56
Support in resolving conflict					.17*		.28*		.40*	.21*					.55
					.02		.10		.72*	.12*					.59
Outcome variable															
Job Satisfaction	.00	.09*	.07	.12*		.16*					.13*	.04	.09*		.42
	.03	.11*	.00	.30*		.09					.01	.17*	.09		.37

*Significant coefficient as it exceeds more than 2 standard errors.

∞ Effects arise from these variables and go to the variables in the column on the left.

† Proportion of explained variance in the intervening and outcome variables.

Note: T1 (year 2004), shaded T2 (year 2006).

Data analysis

For our modelling purposes, we selected all nurses who reported working at least 60% of their time with cancer patients in 2004, and for whom we had data at Time 1 and Time 2 (n=338). Then, we used the matched data (2004 and 2006) to test whether the theoretical model developed at Time 1 also fit the data at Time 2, and whether the factors that influenced job satisfaction of oncology nurses had changed over time. Data were managed using SPSS version 17 and the theoretical model was tested as a stacked structural equation model using LISREL 8.8. The stacked theoretical model allowed us to test the model using 2004 and 2006 data simultaneously in a manner consistent with Hayduk et al. (2010). We chose the chi-square test, as it provides a clear indication of fit between matrices provided by the data and implications of the theoretical model (Hayduk et al., 2007). A significant chi-square in

the test of model fit indicates that the matrices are significantly different suggesting that the theoretical model is mis-specified and should be re-examined. A non-significant chi-square suggests that the theory is a plausible explanation for the relationships in the data.

Results

Demographics

Demographic characteristics of the matched sample (n=338) are provided in Table 1 using the 2004 data as a reference base. Most nurses in the sample were over 45 years of age (61.2%), female (97.3%), and 80.1% were English speaking. Most were employed full-time (73.1%). Nursing education was evenly distributed between college diploma programs (47.2%) and baccalaureate and master's (together 52.8%). By 2006, 48.5% of the sample

had achieved oncology nursing certification through the Canadian Nurses Association. Study participants represented an experienced nursing workforce with almost 54.7% of participants reporting at least 26 years of nursing experience.

Model testing

The chi-square (χ^2) for the stacked model was 106.59 (df = 86, $p=0.065$), indicating reasonable fit between the model theory and the covariance data (Hayduk, 1987). The models displaying significant relationships among the concepts are presented in Figure 1 (2004) and Figure 2 (2006). Both figures display effects that were consistent over time (solid black lines) and were different between 2004 and 2006 (dashed lines). We also reviewed the changes in direct and indirect effects over time. Table 2 presents both significant and non-significant effects (unstandardized) of estimates from our model testing, and the explained variance for each outcome and intervening variable. The explained variance ranged from .17 (enough nurses, 2004) to .59 (support in resolving conflict, 2006). The models explained more than 40% of the variance in job satisfaction: .43 and .37 respectively for 2004 and 2006.

Similarities in oncology work environment relationships over time

Several work environment characteristics had significant relationships in the models over time. All significant relationships were consistent and positive in direction of effect. Nurses' reports of *relational leadership* characterized by administration that listens and responds to their concerns led to greater opportunities for staff development, perceptions of sufficient numbers of RNs to provide quality care, and freedom to make important patient care decisions. Staff development programs consistently led to greater participation by oncology nurses in policy decisions and in support for innovative ideas. *Good working relationships between physicians and nurses* led to greater freedom to make important patient care decisions in both 2004 and 2006. In turn, enough nurses to provide quality care and freedom to make important patient care decisions consistently influenced job satisfaction over time.

Visible nursing leadership by the senior nursing administrator and a clear philosophy of nursing consistently led to greater perceived support for innovation. *Nurse managers consulting with staff* led to supervisor support in managing conflict, and this relationship strengthened over time (coefficient was .40 in 2004 and .72 in 2006). We had hypothesized that age and gender were not related to any variables in the model including job satisfaction at either time period. The testing results confirmed this.

Differences in predictors of job satisfaction over time

In 2004, relational nursing leadership significantly influenced supervisor support for managing conflicts, whereas in 2006, relational leadership also led to nurses' perceptions of increased support for innovative ideas.

In 2006, the number of direct and indirect pathways to job satisfaction changed since 2004. In 2004, a clear philosophy of nursing was linked to participation in policy decisions, whereas in 2006, a clear philosophy of nursing directly influenced job satisfaction. In 2004, good working relationships between physicians and nurses influenced job satisfaction directly whereas in 2006, good working relationships between physicians and nurses worked through freedom to make patient care decisions, and enough RNs to provide quality care, both of which led to increased job satisfaction. Supervisor support and perceived ability to influence patient care outcomes directly influenced job satisfaction in 2004, but were no longer significant in 2006. A visible and accessible nursing leader was negative related to freedom to make important patient care decisions in 2004 and no relationship was noted in 2006.

Discussion

Our results show changes in the pathways of relationships that significantly influenced nurses' job satisfaction over time. The consistency in some pathways to job satisfaction and changes in others may be attributed to a variety of factors. For example, considerable restructuring of the work environments, models of care and economic pressures in cancer care services may have changed the role of the nurse from worker to professional (Bakker et al., 2010a). Restructuring of health care in the 1990s and early 2000s led to the development of multidisciplinary teams, and was often cited for leaving nursing without its own distinct identifiable voice in the health care organization. The negative relationship between a visible nursing leader and nurses' freedom to make important patient care decisions in 2004 may, in fact, reflect a time when these leadership roles were made redundant. Efforts to re-institute senior nursing leadership positions in oncology settings that are relational in emphasis and provide professional practice support may have resulted in a stronger nursing identity, firmer theoretical foundations of care, and a growing importance of professional pride seen in oncology nurses (Morgan & Lynn, 2009).

The creation of a stronger nursing identity results from empowerment, which also increases job satisfaction. This is consistent with other work (Ridley et al., 2009; Ning et al., 2009), where nurses reported greater empowerment in work environments that provided opportunities for learning and were conducive to positive organizational relationships with colleagues.

The significance of nurse/physician relationships remained strong in both 2004 and 2006. Good physician/nurse relationships significantly influenced nurses' freedom to make important patient care decisions, which, in turn, influenced job satisfaction. Nurses' job satisfaction was significantly related to strong nursing and interdisciplinary team relationships in previous oncology nursing studies (Ridley et al., 2009; van Rooyen et al., 2008). A clear philosophy of nursing directly influenced participation in policy decisions in 2004, but later worked through innovative ideas. Our study signals the importance of both strong physician/nurse relationships and a strong nursing identity/philosophy in supporting nurses' contributions to multidisciplinary teamwork in oncology settings, and to increasing nurses' job satisfaction.

Relational leadership was a strong influence on staff development programs, enough RNs to provide quality care, and freedom to make important patient care decisions over time. Relational leadership creates an environment where nurses are motivated to do more than they originally believe they can. Therefore, the stronger emergence of leaders' support for innovative ideas, as an important factor in nurses' job satisfaction, is quite conceivable. Supportive nursing administration is needed to help develop nurses' autonomy, which further supports the link between freedom to make important patient care decisions and relational leadership seen from these results (Cummings, 2004; Gagnon et al., 2010). The changing relationships between relational leadership and support for resolving conflict may point to a changing context where nurse managers deal more directly with conflict management than in our earlier data. This is evident in the increased strength of the relationship between nurse manager consulting with staff and supervisor support in resolving conflicts, which may signal a change in leadership structure or patterns.

These results impact nurses, leaders, managers, educators and researchers in nursing and, more specifically, oncology nursing. The current age of the oncology nursing workforce suggests an urgent need to recruit nurses to this area and retain those with experience and knowledge to share and teach novice practitioners. The specialized nature of oncology nursing also requires further inclusion of experiences with oncology and palliative patients in baccalaureate nursing education in order to ensure graduating nurses have knowledge and skills to enter this recognized specialty. The present

system is also undergoing transformative changes with the inclusion of technology in the work environment, driving an ongoing need for continuing education to support the changing context for practice. As well, due to the changing nature of predictors influencing nurses' job satisfaction, further study is warranted to monitor and understand how organizations can respond to the diverse and changing nature of this dynamic workforce, and to provide opportunities for nurses to be innovative in using information/communication systems.

Findings from this study also emphasize the need for leaders and managers to implement strategies that address the changing nature of oncology nursing environments and the populations served by oncology nurses. Tourangeau et al. (2006) suggested that job satisfaction will continue to change for many years to come. Necessary strategies aimed at increasing job satisfaction are similar to those proposed by Hayes et al. (2005). These strategies include the implementation of comprehensive orientation, and mentorship programs suitable for the broad spectrum of nurses' levels of experience found in oncology settings, along with the offering of professional development opportunities that address the special needs of nurses in oncology areas. Opportunities for reflection are recommended to address the stressful nature of oncology nursing. It is also important that managers understand how nurses' perceive their workplaces in order to identify indicators of positive work environments, as well as issues of concern (Bakker et al., 2010a, 2011). Implications of study results for policymakers include the need to support nursing workforces planning for a sustainable future. As well, recognition of the changing nature of nurses' job satisfaction and its influencing factors, such as enough RNs to provide quality care and nurses' freedom to make important patient care decisions, is critical in policy development. In light of the prevalence of cancer in our growing, older population, emphasis on relations with families of patients, ongoing evidence-based practice and open access to information are needed in oncology settings and in future testing of models on job satisfaction.

Findings from this study are also relevant to researchers. Further study on the changing nature of variables that affect nurses' job satisfaction is needed. Longitudinal studies that examine how variables of job satisfaction change over time in relation to contextual changes will better inform recruitment and retention strategies that will be effective for nurses in oncology and other specialized areas. Context is an important aspect of these research findings and an important variable that needs to be included in studies examining job satisfaction of nurses.

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Limitations of this study include the short time between data collection times. However, it was a three-year study. Also, in our models we did not differentiate the settings where oncology nurses worked, such as oncology clinics, inpatient, or medical day units. However, we did include data in our analyses from nurses who worked predominantly with patients affected by cancer.

Conclusion

This study illuminates consistencies and changes in factors that influenced oncology nurses' job satisfaction over time. Leadership and its indirect effects on nurses' job satisfaction were significant over time related to providing enough RNs to provide care, staff development programs, innovation and resolving conflict, which, in turn, influenced nurses' job satisfaction. Both physician/nurse relationships and a strong nursing philosophy/identity are important influences on oncology nurses' job satisfaction. The multifactorial nature of nursing work environments creates fertile ground for further research (Rafferty & Clarke, 2009). This study emphasizes the fluid nature of job satisfaction amidst a nursing context emerging from restructuring in health care and experiencing nursing shortages that threaten the quality of nursing care and sustainability of the nursing workforce. Further research that considers context over time would continue important efforts to recruit and retain nurses in oncology settings. ❏

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Supplementary Table A: Indicators and the measurement error specification for the latent concepts in the structural equation model

Latent Concept	Survey item(s)	% assessed as measurement error	2004		2006	
			Variance	Measurement error variance	Variance	Measurement error variance
Intervening and Outcome variables						
Staff Development	<i>Active staff development or continuing education program for nurses (4 point Likert)</i>	5	0.855	0.04275	0.784	0.0392
Enough nurses	<i>Enough RNs on staff to provide quality care to patients (4 point Likert)</i>	5	0.878	0.0439	0.862	0.0431
Policy	<i>Opportunity to participate in policy decisions (4 point Likert)</i>	5	0.738	0.0369	0.764	0.0382
Freedom	<i>Freedom to make important patient care decisions (4 point Likert)</i>	5	0.605	0.03025	0.635	0.03175
Ideas	<i>Support for new and innovative ideas (4 point Likert)</i>	5	0.593	0.02965	0.628	0.0314
Support in resolving conflict	<i>A manager who backs up nursing staff even if the conflict is with a physician (4 point Likert)</i>	5	0.778	0.0389	0.799	0.03995
Job Satisfaction	<i>Today I work in oncology ... 1. but I am dissatisfied and have definite plans to leave my job 2. but I am sufficiently dissatisfied that I am thinking of leaving my job 3. and I am somewhat satisfied with my job 4. and I am very satisfied with my job</i>	35	0.438	0.1533	0.582	0.2037
Causal Variables						
Relational leadership	<i>Administration that listens and responds to staff concerns (4 point Likert)</i>	20	0.438	0.1533	0.582	0.2037
Visible nursing leadership	<i>A senior nursing administrator who is highly visible and accessible. (4 point Likert)</i>	15	0.78	0.156	0.823	0.1646
Nurse managers consult with staff	<i>Nurse managers consult with staff on problems (4 point Likert)</i>	20	1.001	0.1501	1.003	0.1504
Physician/Nurse relationships	<i>Physicians and nurses have good working relationships (4 point Likert)</i>	10	0.874	0.1748	0.83	0.166
Philosophy of Nursing	<i>A clear philosophy of nursing (4 point Likert)</i>	10	0.475	0.0475	0.475	0.0475
Influence patient care	<i>I feel I'm positively influencing the lives of patients and families (6 point Likert)</i>	25	0.917	0.2292	0.859	0.2147
Age	<i>What is your age? (age in years)</i>	5	72.555	3.6277	72.555	3.6277
Gender	<i>What is your sex? (male/female)</i>	20	0.438	0.1533	0.582	0.2037

Supplementary Table B: Covariance and Correlational Matrix of Time 1 (2004) and Time 2 (2006) datasets

	Staff Development	Enough Nurses	Participate in policy	Freedom	Support for new ideas	Support in resolving conflict	Job Satisfaction	Relational leadership	Visible nursing leadership	Nurse managers consult with staff	Physician/Nurse relationships	Clear philosophy of Nursing	Influence Patient care	Age	Gender
Staff Development	0.855	.275**	.428**	.392**	.411**	.349**	.277**	.436**	.319**	.313**	.264**	.387**	.129*	.076	-.048
	0.784	.241**	.445**	.357**	.485**	.404**	.287**	.477**	.385**	.458**	.137*	.342**	.069	.040	-.060
Enough Nurses	0.239	0.878	.247**	.295**	.206**	.189**	.264**	.346**	.199**	.187**	.135*	.276**	.013	.146**	-.086
	0.198	0.862	.213**	.297**	.273**	.233**	.289**	.416**	.271**	.292**	.265**	.165**	.043	.043	-.008
Participate in policy	0.341	0.198	0.738	.523**	.510**	.388**	.340**	.461**	.361**	.351**	.272**	.465**	.039	.053	-.011
	0.344	0.173	0.764	.527**	.546**	.297**	.309**	.491**	.359**	.367**	.204**	.333**	.067	.115*	.034
Freedom	0.283	0.215	0.349	0.605	.495**	.349**	.368**	.507**	.247**	.294**	.294**	.412**	.119*	.010	-.122*
	0.252	0.220	0.368	0.635	.466**	.321**	.463**	.467**	.379**	.330**	.287**	.383**	.084	.075	-.043
Support for new ideas	0.292	0.149	0.337	0.296	0.593	.543**	.346**	.543**	.560**	.494**	.236**	.529**	.066	.084	-.067
	0.341	0.201	0.378	0.295	0.628	.460**	.394**	.602**	.507**	.483**	.221**	.509**	.101	.013	.014
Support in resolving conflict	0.286	0.156	0.295	0.239	0.369	0.778	.374**	.549**	.491**	.558**	.268**	.491**	.049	-.001	-.023
	0.322	0.194	0.233	0.229	0.325	0.799	.322**	.532**	.501**	.651**	.146**	.444**	.076	.059	.017
Job Satisfaction	0.17	0.164	0.194	0.19	0.177	0.219	0.438	.344**	.310**	.265**	.298**	.337**	.151**	.053	-.058
	0.193	0.204	0.205	0.282	0.239	0.223	0.582	.406**	.293**	.376**	.221**	.379**	.159**	.189**	-.041
Relational leadership	0.357	0.286	0.349	0.348	0.37	0.429	0.201	0.78	.531**	.503**	.148**	.476**	.090	.025	-.039
	0.382	0.350	0.39	0.338	0.432	0.433	0.281	0.823	.536**	.573**	.168**	.454**	.045	.072	.006
Visible nursing leadership	0.295	0.186	0.309	0.192	0.432	0.432	0.206	0.468	1.001	.499**	.083	.441**	.039	-.014	.009
	0.342	0.252	0.314	0.303	0.403	0.449	0.226	0.488	1.003	.560**	.139*	.344**	.014	-.027	.001
Nurse managers consult with staff	0.269	0.163	0.281	0.213	0.353	0.461	0.164	0.414	0.466	0.874	.094	.418**	.058	-.003	-.017
	0.370	0.247	0.291	0.240	0.349	0.531	0.262	0.473	0.51	0.83	.056	.426**	.031	.002	.066
Physician/Nurse relationships	0.168	0.087	0.161	0.158	0.125	0.163	0.136	0.09	0.058	0.06	0.475	.315**	.128*	.068	.007
	0.083	0.167	0.121	0.156	0.12	0.09	0.113	0.104	0.095	0.035	0.465	.257**	.120*	.100	-.060
Clear philosophy of Nursing	0.295	0.213	0.329	0.265	0.336	0.356	0.184	0.346	0.363	0.322	0.179	0.678	.128*	.090	-.026
	0.253	0.127	0.241	0.253	0.336	0.33	0.24	0.342	0.287	0.323	0.146	0.693	.166**	.059	-.092
Influence Patient care	0.114	0.011	0.032	0.089	0.049	0.042	0.096	0.076	0.037	0.052	0.084	0.101	0.917	.011	.044
	0.057	0.037	0.054	0.062	0.075	0.063	0.109	0.038	0.013	0.026	0.076	0.129	0.859	-.027	-.069
Age	0.598	1.165	0.387	0.067	0.552	-0.004	0.301	0.191	-0.122	-0.022	0.399	0.631	-0.362	72.55	.011
	0.302	0.344	0.854	0.506	0.09	0.447	1.213	0.554	-0.227	0.014	0.581	0.418	0.208	72.55	.011
Gender	-0.007	-0.013	-0.001	-0.015	-0.008	-0.003	-0.006	-0.006	0.002	-0.003	0.001	-0.003	-0.011	0.015	0.026
	-0.009	-0.001	0.005	-0.005	0.002	0.002	-0.005	0.001	0	0.01	-0.007	-0.012	-0.007	0.015	0.026

Covariances in lower left half of matrix; variances on diagonal; correlations in upper right half of matrix.

* Correlation is significant at the 0.05 level (two-tailed)

** Correlation is significant at the 0.01 level (two-tailed)

Note: T1 (yr 2004), T2 (yr 2006) shaded.