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Effects of Work Environments on Nursing and Patient Outcomes

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EFFECTS OF WORK ENVIRONMENTS ON NURSING AND PATIENT OUTCOMES

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Abstract

Nurses are leaving the profession due to high levels of job dissatisfaction arising from current working conditions characterized by heavy workloads, limited participation in decision making and lack of development opportunities (Canadian Health Services Research Foundation [CHSRF], 2006a). To gain organizational support for workplace improvements and thereby improve nursing retention, evidence is needed to demonstrate the impact of the work environment on patient care. The purpose of this study was to determine the relationship between nurses' perceptions of their work environment and the quality and risk outcomes for both the patient and the nurse.

Kanter's (1977, 1993) theory of structural empowerment guided the study. Empowering work environments for nurses were hypothesized to impact group processes and thereby work effectiveness as reflected in patient outcomes (patient satisfaction, therapeutic self care, falls and nurse-assessed risks). Empowering workplaces were also hypothesized to enhance the nurse's psychological empowerment and, in turn, engagement in empowering behaviours that lead to quality care and job satisfaction.

A multi-level cross-sectional design was used to test the study model. Self-report surveys were used for a sample of nurses (n=679) and discharged patients (n=1005) affiliated with medical and surgical units from 21 hospitals in Ontario. Unit characteristics and falls data were obtained from existing hospital databases. Using multilevel structural equation modeling, the hypothesized model fit well with the data ($\chi 2$=21.074, df=10, CFI=.985, TLI=.921, RMSEA=.041, SRMR .002[within] and .054[between]). Empowering workplaces had positive effects on nurse-assessed quality of care and predicted fewer falls and nurse-assessed risks as mediated through group

processes. These conditions positively impacted individual psychological empowerment which, in turn, had significant direct effects on empowered behaviour, job satisfaction and care quality.

Theoretically, evidence supported the further evolution of structural empowerment theory to include group processes and empowered behaviour as mediators to various nurse and patient outcomes. The evidence from this study also reinforced the critical need to invest in improving nursing work environments for the benefit of patients and nurses. Theory-informed strategies for changes to the workplace have the potential to mitigate against projected nursing shortages and ensure a sustainable workforce to meet future demands for care.

Key words: work environments, empowerment, group processes, teamwork, nursing-sensitive patient outcomes, quality of care, adverse events, patient safety, patient satisfaction, job satisfaction

Dedication

This work is dedicated to the memory of my parents Walter Nicholson, who was an early graduate of Ryerson after returning from World War II, and Loretta (King) Nicholson, a graduate St. Joseph's Hospital (Guelph) School of Nursing class of 1942. I am forever grateful for their love and support that created the foundation for the academic and professional successes achieved by myself and my siblings. They taught us the value of hard work and the pride of accomplishment.

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I have been blessed with a large network of family, friends, and colleagues who have cheered me on and propped me up through the hills and valleys of doctoral studies. My peer mentoring group (Sara, Allison and Heidi) have been there to motivate, encourage and entertain. Together with my fellow commuter and confidant Joan, deep friendships have been formed that will last for years to come. Mary, Janice and Michelle helped plant the seeds of success and kept me grounded, informed and connected as my new career took shape. I cannot underestimate the role played by my family who unwittingly were taken on this journey along side of me. To my sons Brendan and Sean and especially my husband Phil, thanks for enabling me to pursue my dream.

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Chapter 1

Introduction

Nurses are leaving the profession due to high levels of job dissatisfaction arising from current working conditions that are characterized by heavy workloads, limited participation in decision making and lack of development opportunities (Canadian Health Services Research Foundation [CHSRF], 2006a). To gain organizational support for workplace improvements and thereby improve nursing retention, evidence is needed to demonstrate the impact of the work environment on patient care. To that end, the background for this study includes an overview of nursing work environments and the link to patient outcomes with teamwork as a possible mechanism through which the outcomes are achieved. Nursing outcomes, as a product of empowering workplaces, are also described as central concepts for this research. The problem statement and study purpose are identified followed by a discussion of the significance of the study to practice, policy and theory development.

Background

Nurses comprise the largest group of professionals within the healthcare workforce and provide 75% of the care received by patients in hospital settings (Nursing Task Force, 1999). There is an increasing demand for healthcare and nursing services due to population growth and, more significantly, due to the increasing proportion of people over the age of 65. At the same time, the supply of nurses is diminishing. In 2007, the shortage of nurses in Canada was 11,000 and is projected to rise to 60,000 nurses by 2022 if effective solutions are not implemented (Tomblin Murphy et al., 2009). Progress has been made over the last five years to increase the supply of nurses but the ratio of nurses to population is less than levels in the 1990's (Canadian Institute for Health

Information [CIHI], 2010). An example of how the shortage is being experienced by nurses in direct care roles was found in the National Study of the Work and Health of Nurses where over 50% of nurses reported that they often arrived at work early or stayed late, worked through breaks in order to get work completed and 67% report that they had had too much work for one person (CIHI, 2006).

Hospitals have been subject to a decade of restructuring and downsizing in response to fiscal pressures. Based on a systematic review of 22 empirical papers, Cummings and Estabrooks (2003) found that impact of restructuring on nurses included decreased job satisfaction, increased turnover and that these changes affected their ability to provide quality patient care. With advances in medical diagnosis and treatment, patients within hospitals are notably more acute and their care more complex. Taken together, the work environments for nurses are more challenging and less satisfying.

Several policy-related documents have been prepared that address the state of nursing work environments in Ontario and in Canada. The themes common to all of the reports are problematic working conditions and strained work relationships. Working conditions refer to operational issues that include heavy workloads, inflexible scheduling, a disproportionate use of part time and casual employment and a high use of unregulated workers (skill mix). Work relationship issues include the quality of leadership, lack of control over practice and limited participation in decision making (Baumann et al., 2001; Canadian Nursing Advisory Committee, 2002; Nursing Task Force, 1999). A series of recommendations have followed whereby organizations, professional associations and policy makers have been directed to implement evidence-based strategies that could improve the workplace and sustain the supply of nurses for the purpose of ensuring the delivery of quality patient care. Despite evidence and awareness of work environment

issues, nurses across Canada report that little has changed (CIHI, 2006; Nursing Sector Study Corporation, 2004).

Workplace Empowerment.

The majority of employer-directed recommendations to improve work environments, as noted in these reports, align with the key dimensions of Kanter's theory of workplace empowerment (Purdy, 2004). Workplace empowerment is defined as the having power to access the structural factors within the work environment that enable the employee to get work done (Kanter, 1977/1993). Through studies involving hospital-based staff nurses, there is evidence that empowering workplace conditions predict both work effectiveness and job satisfaction (Laschinger, Almost, & Tuer-Hodes, 2003; Laschinger & Havens, 1996) as well as intent to stay (Nedd, 2006). Therefore, creating more empowering workplaces could facilitate nurse retention.

With only one exception (Laschinger, Finegan & Wilk, 2009), the design of workplace empowerment studies in nursing has been at the individual-level that fails to capture the contextual effects of a given patient care unit. Since the majority of strategies to improve the workplace are delivered at the unit level, the outcomes of these efforts should be observable at the unit or group level. One would then expect to find differences in empowerment and outcomes between units where workplace strategies have been implemented as compared to units that have not. By measuring the work environment at the group level, it is possible to capture the differences in outcomes that can be attributed to structurally empowering factors operating within the patient care unit. In addition, it is possible that group-level factors also influence individual job behaviours and attitudes. Therefore, a multi-level model testing the effects of structurally empowering conditions on group and individual outcomes could extend our understanding of the empowerment

theory while at the same time potentially provide more valid evidence of the effectiveness of empowerment-oriented interventions.

Work Effectiveness and Patient Outcomes.

Work effectiveness for nurses is manifested in the quality of care received by patients. Patient outcomes that are sensitive to nursing care include both quality-related outcomes (patient satisfaction, ability to perform self care activities on discharge from hospital, functional status and symptom management) and risk-related or patient safety outcomes (falls, pressure ulcers/sounds, nosocomial infections, medication errors and mortality) (Doran, 2003). While excessive workloads and inadequate staffing have been implicated in the incidence of these risk outcomes (Aiken, Clarke, Sloane, Sochalski & Silber, 2002; Blegen, Goode, & Reed, 1998; Kovner & Gergen, 1998), less is known about other workplace factors such as access to resources, supports, information, and opportunities for development and their effect on quality and risk patient outcomes. Lowe (2002), Vahey, Aiken and Sloan (2003) and Mulvey Boyle (2004) suggest that future research should focus on the mechanisms through which work environment factors affect nurses and patient outcomes.

Teamwork.

Chen, Kirkman, Kanfer and Allen (2005) suggest that structural factors that drive individual effectiveness may also drive the effectiveness of work groups or teams. Empowerment has been deemed a key driver of team effectiveness (Chen & Klimoski, 2003) and empowered workers have been found to be more cooperative and less critical (Kanter,1977/1993). Empowering conditions have also resulted in group effectiveness whereby greater team effort and the sharing of responsibilities were observed (Koberg, Boss, Senjem & Goodman, 1999). Structural conditions that include the provision of

adequate support, resources and information as well as opportunities to perform a variety of team tasks have also been advocated to enhance team effectiveness (Campion, Papper & Medsker, 1996). Within the healthcare setting, effective teamwork has been found to improve the quality of patient care while decreasing risk but structural factors that support teamwork require further study (CHSRF, 2006b). The need for research on the impact of nursing-specific teams on patient outcomes has also been advocated (Pringle & White, 2004; Registered Nurses Association of Ontario [RNAO], 2006). To date, the effect of empowering conditions on team behaviour and consequently work effectiveness in the context of the nursing workplace has yet to be examined.

Nursing Outcomes.

Access to empowering conditions in the work environment leads to the experience of psychological empowerment which is defined as one's work being perceived as meaningful, that it has impact on organizational outcomes, there is feeling of control over ones' work and that the individual is confident in their ability to meet work expectations (Spreitzer, 1995). Psychological empowerment is a significant predictor of job satisfaction, productivity/effectiveness and decreased intent to leave the organization (Koberg, Boss, Senjem & Goodman, 1999; Laschinger, Finegan, Shamian & Wilk, 2004).

For perceptions of empowerment to translate into work effectiveness, a set of behaviours arising from feeling empowered must be enacted. The literature suggests that empowered behaviour includes proactive, focused efforts that are self-initiated (Kuokkanen, Leino-Kilpi & Katajisto, 2003; Thomas & Velthouse, 1990) but there is little research to empirically test the link between empowering work conditions and the occurrence of empowered behaviour. Encouraging results were reported by Knon & van Linge (2009) who found that nurses who experienced higher levels of psychological

empowerment engaged in more innovative behaviours such as recognizing problems, generating ideas, mobilizing support and implementing their ideas. The authors recommend that other contextual variables be considered in understanding factors that promote these proactive behaviours. For nurses in direct care roles, reliance on team members for support and shared workload would be critical if the nurse were to take time away from patient care to pursue solution-focused activities. It is also possible that team or work group processes may either enable or block the expression of empowered behaviour.

There is a large body of evidence supporting the relationship between quality work environments and nurse job satisfaction (Aiken, Clarke, Sloane, Lake & Cheney, 2008; Laschinger, Finegan, Shamian & Wilk, 2004; Laschinger, 2008) as well as nurse-assessed quality of patient care (Laschinger, 2008; Laschinger, Shamian & Thomson, 2001). The mechanisms by which these outcomes occur are less well understood. It is possible that nurses who engage in empowered behaviours may experience greater levels of job satisfaction as their proactive behaviour leads to success in terms of solving work-related problems. Similarly, empowered behaviours could result in improved patient care as evidenced in nurses' evaluations of the care they have delivered.

Problem Statement

Through a large body of research conducted over the last decade, it is well acknowledged that improving nursing work environments to ensure an adequate supply of professionals is critical to meeting future demands for patient care. Despite the awareness of these issues, there is a general consensus that organizations must do more to support and retain their current employees (Quality Workplace Quality Healthcare Collaborative [QWQHC], 2007). Professional associations and government agencies have developed

various databases of solutions to improve the workplace but the uptake and pace of change has been inadequate (QWQHC). As organizations struggle to meet accountability agreements that demand balanced budgets, major barriers to investing in workplace strategies are due to competing priorities between rising costs for care and managing health human resource issues. As one Chief Executive Officer noted, 'important' is no longer enough and initiatives that involve cost must also show value at the patient level (L. Thomson, personal communication, June 5, 2009). Therefore, by demonstrating the effect of nursing work environments on the quality of patient care, the mutual goal of quality patient care may be achieved through investments focused on improving the work environment for nurses. By evaluating the work environment from an empowerment perspective, theory-directed strategies to enhance structural factors in the workplace could be employed for the benefit of nurses and patients.

Study Purpose

In summary, empowering work environments for nurses has the potential to impact group processes and thereby improve work effectiveness as reflected in patient outcomes while at the same time, enhancing the individual nurse's engagement in empowering behaviours that lead to quality care for patients and job satisfaction for nurses. Therefore, the purpose of this study was to determine the relationship between nurses' perceptions of their work environment and the quality and risk outcomes for both the patient and the nurse in acute care settings. This research was been designed to extend our knowledge of structural empowerment theory and our understanding of nursing work environments as outlined in the following study objectives:

1. to determine the impact of empowering work conditions on individuals and on group processes that contribute to work effectiveness,

2. to determine the impact of empowering work conditions on subjective and objective measures of patient outcomes,
3. to examine if perceptions of empowering workplaces are manifested in empowered behaviours, and
4. to test the relationships between work environments and nursing and patient outcomes using a multilevel model that acknowledges the contextual effects of groups on individual nurse attitudes, behaviours and work effectiveness.

The hypothesized model that guided this study is depicted in Figure 1 (p. 42) in the next chapter.

Significance

The results of this investigation can be used to create theory-based and evidence-informed strategies to enhance nursing workplaces with the potential to support the delivery of quality patient care. Structural empowerment factors are amenable to change by individual nurses, management and the organizations so that improving the workplace becomes everyone's responsibility. The study can contribute to the growing body of knowledge regarding effective work environments in hospital settings particularly regarding the link to objective measures of nursing-sensitive patient outcomes. Professional associations, unions and government agencies can use the study results to make a business case for investments in work environments based on advancing the agenda of quality care and patient safety as well as mitigating, to some degree, the growing nursing shortage. Structural empowerment theory can be expanded through the investigation of possible mechanisms through which patient and nursing outcomes are achieved i.e. group processes and empowered behaviours, respectively.

Summary

The current and projected nursing shortage has been fuelled by conditions in the workplace that block work effectiveness and job satisfaction. Kanter's (1977, 1993) theory of structural power in organizations encompasses many of the concepts found within recent reports and recommendations for improving workplace conditions for nurses and therefore is a useful framework to guide the study of nursing work environments. The effect of workplace conditions on how nurses work together as a team was examined as a possible mechanism through which work effectiveness, in the form of quality patient care, is realized. The impact of work environments on nurse outcomes was also tested as an important contributor to enacting empowered behaviours leading to job satisfaction and the nurses' evaluation of the patient care delivered. The intent of this multi-level approach to examining nursing work environments was to expand our understanding of the critical link between the quality of the workplace and both nursing and patient outcomes so that a more compelling case could be made for investing in strategies to create a healthy workplace. The key concepts for the study are further elucidated in the review of the literature presented in the next chapter.

Chapter 2

Theoretical Framework and Review of the Literature

Based on a review of the literature, the theoretical underpinnings and empirical support for each of the study concepts are expanded upon in this chapter. Kanter's theory or structural empowerment (1977/93) is used to describe nursing work environments. By applying a system's approach to teamwork, group processes are examined as the link between empowering work environment structures and work effectiveness outcomes. Current knowledge on selected indicators of nursing work effectiveness is provided encompassing both quality and risk-oriented patient outcomes. The discussion continues with a review of nurse outcomes occurring at the individual level. Psychological empowerment, as a cognitive consequence of structural workplace factors, is described as well as empowered behaviour, a mediating mechanism to the overall nurse outcomes of job satisfaction and nurse evaluations of the quality of patient care. Contextual effects of empowering conditions and teamwork on nurse outcomes are then delineated. Within each section, gaps in current research and knowledge are identified to further support the rationale for this study. The conclusion of the chapter includes the hypothesized study model and subsequent hypotheses that have guided this research.

Effects of Work Environments on Patient Outcomes

Structural empowerment.

The concept of structural empowerment is built upon the notion that removing conditions that foster dependence and powerlessness within an organization will result in positive employee behaviour and improved performance (Conger & Kanungo, 1988; Kanter, 1977/1993). According to Kanter's theory of structural empowerment, power sources for employees arise from both formal and informal sources. Formal power is

achieved from the characteristics of the specific role one fills and informally through personal alliances and connections within the work setting. These forms of power increase the employee's access to conditions that enable them to accomplish their work more effectively. Empowering conditions include access to opportunities, information, support, and resources. Access to opportunities involves work activities that provide challenge, learning, growth and autonomy. Access to information about technical knowledge and organizational goals helps the individual to function more effectively in their role. Employees who receive support in the form of feedback and guidance are also better able to meet role expectations. Access to resources such as equipment, supplies and time to do the work likewise enable role performance. From this theoretical perspective, these workplace conditions offer more power to the individual to accomplish their work.

The application of an empowerment framework to guide workplace improvements has been tested in over 75 studies involving staff nurses, advanced practice nurses and nursing leaders within diverse health care settings and across many countries (Laschinger, 2006). There is a growing body of evidence that empowering work conditions predict positive outcomes for the nurse, the patient and the organization. Empowering workplaces have been shown to be related to various preferred job attitudes such as job satisfaction, trust and respect, organizational commitment and nurse-physician collaboration *(*Laschinger, Almost & Tuer-Hodes, 2003; Laschinger, Finegan, & Shamian, 2001; Laschinger, Finegan, Shamian & Wilk, 2004; Laschinger, Finegan & Wilk, 2009). Nurses working in empowered environments also report improved health outcomes such as improved energy levels, less emotional exhaustion and job strain, fewer physical stress symptoms and better mental health *(*Laschinger, Almost, Purdy & Kim,

2004; Laschinger & Finegan, 2005; Laschinger, Finegan, Shamian & Wilk, 2001, 2003; Tigert, 2004). The organization also benefits from the creation of empowering work conditions. Across a number of studies, significant relationships between access to structural empowerment factors and organizational outcomes have been identified such as improved accountability, work effectiveness and performance, lower turnover intentions and an improved patient safety culture (Armstrong, Laschinger & Wong, 2009; Koberg, Boss, Senjem & Goodman, 1999; Laschinger & Havens, 1997; Laschinger, Leiter, Day & Gilin, 2009; Laschinger & Wong, 1999; Nedd, 2006; Spreitzer & Mishra, 2002).

Benefits of empowering work conditions on patients have been evidenced in higher levels of patient satisfaction and improved quality of care (Donahue, et al., 2008; Laschinger, 2008; Laschinger, Finegan, Shamian & Wilk, 2001). Measures of patient care quality have been largely based on the nurses' perceptions and have not been tested using objective measures of patient care quality. Patients' perceived ability to manage their health condition after leaving the hospital and the incidence of adverse events such as falls offer two such measures. As well, there have not been any studies asking patients directly about their satisfaction with nursing care in relationship to the quality of the nurses' work environment. This study addresses these gaps.

Teamwork/Group processes.

The direct relationship between empowered work environments and outcomes for nurses, patients and organizations has been supported in numerous studies but the mechanisms by which these outcomes are achieved has received limited attention. It is possible that structurally empowering conditions are mediated by teamwork or group processes (terms used interchangeably in this report) accounting for work effectiveness observed within acute care settings. Contextual factors that empower individuals may also

empower the group to perform effectively as well. For aspects of work that require interdependent activity, the group itself may serve as a source of information, support, resources and opportunity for the members within it. Nurses employed on patient care units have responsibilities for an assigned group of patients and work both independently and interdependently with other nursing team members to accomplish work goals. Interdependence between work group members is manifested in mutual problem-solving and consultation on patient care issues, providing physical assistance with care activities, mentoring new team members and completing tasks for one another during breaks, meetings or on any occasion where the nurse is required to be away from the unit temporarily. These types of task interdependencies require nurses to work together within and across shifts and nurses often view their work group as comprising all of the nurses that work on their unit regardless of whether they work full or part time (Anthony, 2005). Many of the studies of nursing work groups have been limited to an interdisciplinary focus and have not substantively examined the nature and quality of nurse-nurse interactions occurring within the work group or the outcomes of these group interactive processes. As an exception, Kalish, Weaver and Salas (2009) examined nursing-specific teams to describe teamwork processes operating in acute care inpatient settings. In their qualitative study, they obtained support for the presence of several team processes including shared mental models (interdependence), back-up behaviour, leadership and communication although their study did not address the context in which these processes functioned. Therefore, an examination of teamwork and the associated group processes offers the potential to better understand the impact of empowered work environments on patient outcomes from a theoretical and practical perspective.

An input-process-output (IPO) model of group behaviour (McGrath, 1984) provides a broad approach to understanding the links between structural conditions, their impact on group processes and the resultant outcomes enabled by group behaviour. Using a system's perspective, *inputs* refer to characteristics of team members (e.g. competencies) or structural and contextual factors (e.g. leader influence, environmental complexity) that influence how team members interact (Mathieu, Maynard, Rapp & Gilson, 2008). *Processes* refer to the types of interactions that occur between team members to accomplish their work and *outcomes* are the product of the team's efforts e.g. quality and quantity of products or affective reactions of the team members (Mathieu et al.). The use of integrative models that simultaneously analyse these sequential relationships between input, process and outcome variables has been recommended as the gold standard to examine teams (Campion, Medsker & Higgs, 1993; Stock, 2004). In more recent works, the IPO framework has been revised whereby 'processes' are redefined as 'mediators' recognizing that not all mediators are processes per se (Ilgen, Hollenbeck, Johnson, & Jundt, 2005, Mathieu et al.).

Wageman suggests that building an appropriate context for work teams is critical and only after this has been addressed, will leadership style have an effect on team behaviour (1996). Conditions that optimise team functioning include, among other factors, a supportive organizational context characterized by the availability of material resources and information necessary to manage the work (Hackman, 1987). Based on measures developed from an extensive review of the literature on groups, group process characteristics that included team self-efficacy (potency), social support, workload sharing and communication and cooperation within the work group were found to be

highly predictive of work effectiveness (Campion, Medsker & Higgs, 1993; Campion, Papper & Medsker, 1996).

There is empirical support for the relationship between team functioning and work effectiveness within the context of hospitals. Hospitals with a strong teamwork culture were associated with more successes in implementing quality improvement programs and, in turn, greater perceived patient outcomes (Shortell et al., 1995). Superior clinical efficiency was found to be related in part to providing people with the tools and authority (i.e. empowerment and training) to carry out the plan. In a study involving chief executive officers from over 1,000 hospitals in Canada, Rondeau and Wagar (1998) found that a strong teamwork culture was significantly correlated with patient outcomes (quality, satisfaction), organizational outcomes (operating efficiency, financial health) and employee outcomes (morale, commitment, and involvement in training and development). Meterko, Mohr and Young (2004) studied 125 Veterans Administration hospitals in the United States and found a significant relationship between teamwork culture and patient satisfaction with inpatient care.

Turning to nursing-specific research, Bae (2008) conducted an investigation of turnover, group processes and patient outcomes measured at the group level. Using a multi-site design, 268 medical and surgical units were included and a random sample of patients within each of these units completed a survey regarding their satisfaction with care received. Work group cohesion was found to positively influence patient satisfaction although the effect size was small (β=.09, $p<.001$). Kemper (2009) analyzed the impact of teamwork at the hospital-level with a sample of 97 acute care facilities. Using a composite of nurse-nurse interactions and nurse-physician interactions as an indicator of teamwork, an inverse relationship between teamwork and patient safety events (pressure

ulcers, nosocomial infections, deep vein thrombosis) and failure to rescue was identified. Teamwork was highly correlated with nurse-assessed quality of care (r=.54).

In summary, creating empowering conditions for the individual may also empower work groups to perform more effectively and in turn, result in improved work effectiveness. Studies of groups in business, hospitals and nursing teams provide encouraging results to support the examination of group processes as a mediating variable in the relationship between empowered work environments and patient outcomes in acute care settings.

Work effectiveness and patient outcomes.

Hackman (1987) identified three criteria to assess team effectiveness: actual group output, capabilities of members to work together on subsequent tasks or goals and the group's ability to meet the needs of its members. For the purposes of this study, the focus was on group output in terms of meeting performance standards related to the delivery of nursing care. Since the intended product of nursing work is quality patient care, work effectiveness is appropriately evaluated in terms of quality and risk-oriented outcomes.

Nurses contribute up to 75% of the care received by patients in hospital settings (Nursing Task Force, 1999). While it is difficult to attribute patient outcomes completely to a single category of health care provider, evidence is accumulating to support the use of indicators that are most sensitive to the care provided by nurses (McGillis Hall, 2003). Nursing-sensitive patient outcomes reflect the nurses' scope of practice, inputs and interventions for which there is empirical evidence linking these activities to patient outcomes (Doran, 2003). In an extensive review of current literature on the quality and

effectiveness of nursing care, a consistent group of relevant, feasible, and evidence-based indicators of nursing care have been identified as patient satisfaction, functional status, self-care, symptom control and safety/adverse occurrences including falls (McGillis Hall). The feasibility of capturing these outcomes for use in an administrative database was tested and supported in a study of acute and long term care facilities in Ontario (Doran et. al, 2006a).

It has only been within the last 10-15 years that the relationship between work environment characteristics and patient outcomes has been studied (Aiken, Sochalski & Lake, 1997). The University of Pennsylvania's Centre for Health Outcomes and Policy Research lead a program of research investigating organizational attributes that were deemed to impact patient outcomes (Aiken, Clarke & Sloane, 2002). Initially, outcomes research focused on differences in patient mortality between magnet and non-magnet hospitals. Magnet-like hospitals, i.e. those that were able to both attract and retain qualified nursing personnel, were found to possess work environment factors that were associated with lower mortality rates. Work environment factors that differentiated magnet from non-magnet hospitals included greater levels of nurse autonomy and control over practice, strong nurse-physician collaborative relationships, and adequate resources (Aiken, Sochalski & Lake; Aiken, Clarke & Sloan). Lower mortality rates were also observed in subsequent studies of dedicated AIDS units within magnet hospitals. Thereafter, the aforementioned workplace factors were shown to impact patient satisfaction and adverse events using large national databases and organization-level analyses (Aiken et al., 2001). Laschinger, Almost and Tuer-Hodes (2003) examined the

two approaches to studying nursing work environments and found that structurally empowering workplace factors positively influenced magnet hospital characteristics.

It is more challenging to identify group-level performance measures that speak to the core business of the organization yet permit comparisons between groups and organizations with varying business mandates. Many researchers have addressed this issue by using generic indices of performance i.e. broad assessments of productivity and quality. Hartner, Schmidt and Hayes (2002) argue that business-unit level data must include outcomes that are directly relevant to the business and represent the way in which data are typically reported to the business units e.g. aggregates of individual-level data such as customer satisfaction and quality of service experienced by the customer.

Often hospital-level outcomes data are not sensitive enough to capture events occurring at the unit level. To test this assumption, Mulvey Boyle (2004) was one of the first researchers to employ a unit-level analysis of the relationship between unit characteristics and patient outcomes within twenty-one medical surgical units in a large teaching hospital in the United States. Units that scored high on various dimensions of the nursing workplace (practice control, nurse –physician collaboration and autonomy, continuity/specialization and nurse manager support) were associated with lower rates of specific adverse events. Lower fall rates were predicted by units that had higher levels of manager support and where nurses had more control over their practice. The findings of the Mulvey Boyle study were promising but were likewise tentative given that the sample size was small, only one hospital was studied, and other confounding variables such as variation in resources (e.g. staffing) were not included in the analysis of adverse events. The current study addressed these limitations through a multi-site design, larger sample

size and controlling for staffing in the statistical analysis. The current study went further to include both quality and risk patient outcomes at the unit-level to examine empowerment, work group processes and work effectiveness.

It is becoming more feasible to obtain unit-level data given the wide-scale implementation of electronic documentation and other information systems. The Health Outcomes for Better Information and Care (HOBIC) Project (Pringle, 2006) was launched in 2006 in Ontario (Canada) as a new database capturing nursing-sensitive patient outcomes for all discharged patients. This database enables the ongoing monitoring and evaluation of patient outcomes that can be used to determine the impact of changes to nursing work environments on the quality of patient care. The patient outcomes selected for this study are a subset of those included in the HOBIC database i.e. falls and therapeutic self- care. Patient satisfaction was also measured as it was not only a nursing-sensitive patient outcome but was also one of the four key indicators that comprise the balanced scorecard used by the provincial government to assess overall hospital performance (CIHI, 2007).

Quality outcomes.

Nursing plays a dominant role in the determination of overall patient satisfaction with healthcare (Abramowitz, Cote & Berry, 1987; Clark, Leddy, Drain & Kaldenberg, 2007). Patient satisfaction has been defined as the degree to which the patient's expectations for care are met in a care episode (Laschinger & Almost, 2003). Meeting patient expectations are influenced by their personal characteristics (e.g. gender, age), structural factors (e.g. service delivery model, provider competence, cleanliness of

physical environment) and the quality of nurse-patient interactions (e.g. caring, pleasant attitude, prompt responses; Larrabee & Bolden, 2001; Laschinger & Almost).

In a study of patients from seven medical-surgical and step-down units in the United States, Larrabee et al. (2004) identified that nurse-caring was a critical predictor of patient satisfaction (β=.72) while contextual factors such as nurse-physician collaboration (β=.14) exerted a smaller direct influence on patient satisfaction. Aiello, Garman and Morris (2003) also examined the various influences on patient satisfaction by analyzing multilevel factors i.e. patient-level characteristics, the episode of care and unit-level characteristics. Using a sample of 141 patients who had experienced multiple admissions to medical or surgical units and had completed more than one patient satisfaction survey, they found that only 1% of the variance in patient satisfaction was attributed to unit-level factors. The specific unit characteristics used for this analysis were not described. The patients in this sample may have been more ill than the average inpatient population given that they had multiple admissions as criteria for eligibility into the study.

Based on this review, there appears to be agreement that contextual factors may contribute to patient satisfaction but the effect may be small when compared to other variables such as patient characteristics or aspects of the nurse-patient interaction. It is possible that a different set of unit characteristics may exert a different degree of influence on patient satisfaction. Given that structural empowerment factors promote work effectiveness thereby enabling the nurse to better meet patient expectations for care, it was postulated that structurally empowering characteristics within a patient care unit would account for some of the variability in patient satisfaction.

From a methods perspective, the measurement of patient satisfaction is problematic since the scores are usually high with limited variance making it more difficult to detect small and medium effects of contextual variables on patient satisfaction (Laschinger & Almost, 2003). In addition, Chang (1997) argues that measures to examine patient satisfaction must include not only patient expectations but also other nursing activities deemed important in the delivery of nursing care to support the validity of patient satisfaction as a nursing-sensitive patient outcome. Finally, the patient satisfaction measure used in research must have practical significance with sufficient detail regarding the patient experience so that quality improvements can be designed at the unit or organizational level. To address these issues, patient satisfaction was evaluated within a 24 hour period prior to discharge so that patient's views were current. Multiple sites were used to maximize the variability in patient satisfaction. For the same reason, all adult patients were invited to participate including those with language or literacy issues as family members could assist with completing the survey using the patient's responses. The patient satisfaction instrument in the current study was more complete than some currently used in practice (19 items versus the five nursing care items found in the National Research Consultants + Picker Canada tool used by the majority of acute care hospitals in Ontario; Loreti, Tse & Murray, 2007).

A second nursing-sensitive quality indicator was selected to assess the impact of work environments on patient outcomes. Therapeutic self-care (TSC) refers to the patient's understanding of their medications and treatments, symptoms, ability to carry out treatments and actions to take in the event of an emergency (Doran, Sidani, Keatings & Doidge, 2002). This knowledge is essential for patients to manage their own care after

discharge from hospital. The nurse plays a key role in developing the TSC ability of patients through such actions as patient and family teaching during the hospitalization period (Sidani, 2003). In a large study involving nurses and patients from 26 medical and surgical units in Ontario, Doran et al. found that the nurses' communication (β=0.15) and performance in their independent role (assessing, planning, implementing and evaluating; β=0.15) significantly contributed to the patient's self-care ability prior to discharge home. In addition, greater TSC ability was significantly associated with improved functional status (ability to independently perform activities of daily living). This latter finding is consistent with results of a similar study of patients from medical and surgical units across Ontario (Doran et al., 2006b). Therefore, work environments that enable nurses to compete their work, including preparing patients to take on self-care activities when home, could influence the patient's confidence in managing their care. TSC was considered a feasible quality indicator for the evaluation of the relationship between work environments and nursing work effectiveness.

Risk outcomes.

Falls are one of the two most common risk-related patient outcomes occurring in hospital settings (Mark et al., 2008) and fall rates are a key nursing metric used to evaluate patient safety and quality (Donaldson, Brown, Aydin, Burnes-Bolton & Rutledge, 2005). Falls, defined as an unintentional movement to the floor or other level that results in the need for intervention or treatment (White & McGillis Hall, 2003; Mulvey Boyle, 2004), are a type of adverse event that is preventable through nursing actions. If the structural factors within a nurse's work environment included adequate resources, among other empowering factors, then the nurse would have more time to

monitor patients at risk for falls and have time to intervene to prevent falls. Dall (2009) analyzed a national database of inpatient falls together with a literature review and determined that the average cost arising from a single patient fall to be $7118 (U. S. funds). Given that the estimated rate of falls during hospitalization has ranged from 2.2 to 7 per 1000 patient days (Hitcho et al., 2004), significant savings could be realized if factors influencing the risk for falls were modified.

Of the various antecedent conditions that impact the rate of falls, the adequacy of nursing resources has been implicated, particularly overall staffing levels and the proportion of RN staff. Sovie and Jawad (2001) examined the effect of hospital restructuring on patient safety by examining fall rates of 52 medical and surgical units across the United States. Higher staffing levels led to reduced fall rates although a cutoff point was observed after which additional staffing had no effect. In a similar effort to evaluate the impact of restructuring, Dunton, Gajewski, Taunton and Moore (2004) studied 1751 medical and surgical units and found that increased staffing (nursing care hours) and the proportion of RN staff accounted for fewer falls, up to a maximum level, but the relationship was observed on medical or medical-surgical units and not surgery-only units. McGillis Hall, Doran and Pink (2004) also analyzed fall rates at the unit-level using a sample from teaching hospitals across Ontario. No significant relationship between the proportion of RN staff and falls was identified although the inclusion of obstetrical units may have diluted the potential effect as this clinical area has much lower fall rates than medical and surgical areas (Hitcho et al., 2004).

In a review of research aimed at identifying the state of the science on the association between falls and staffing, Lankshear, Sheldon & Maynard (2005) considered

studies that had adjusted for the case mix of patient health conditions. Of the 22 large studies reviewed, two-thirds of the studies supported the link between higher nurse staffing levels and fewer patient falls up to a given cut off point. The authors suggested that future research needed to consider the mechanisms through which nursing care impacts patient outcomes and pushed for a more theoretically-informed approach to examining patient falls. In a subsequent systematic review of staffing and falls, Lake and Cheung (2006) analyzed 11 studies with equivocal results regarding the effect of staffing on patient falls possibly due to the variation in designs and measures used to reflect staffing. The authors made several recommendations to improve future research on the relationship between staffing and patient falls. First, they recommended that online administrative data bases and adverse event reporting systems be used to ensure that all occurrences are captured. Second, they argue that all falls should be measured rather than simply 'falls with injuries' since all falls have the potential to be injurious and reflect a poor quality of care. Hickam et al. (cited in Lake & Cheung) recommended that studies of staffing and adverse events would yield better quality results if data is captured and analyzed at the unit-level rather than the organizational level so that confounding factors from diverse types of units are removed. Finally, they suggested that staffing along with variations in nursing practice environments be examined together to determine the association with falls.

More recently, Mark et al. (2008) tested such a model that included factors related to the hospital and unit environment as well as structural factors (e.g. proportion of RN staff; work conditions including autonomy, decision making, participation and relational coordination) and safety climate for their effect on falls and medication errors. The multi-

site study included 278 medical and surgical units from across 146 hospitals in the United States. Unexpectedly, they found that units with a higher proportion of RN staff and a high safety climate experienced more falls. Staffing was not included in the study model and the investigators postulated that adequate staffing may be a necessary condition for the positive effect of RN proportion and safety climate to be observed in fall rates.

Therefore, the current study addressed many of the issues noted in the studies cited above. Only medical and surgical units were included in the sample to limit other confounding factors. A theory-informed model that incorporates a different set of work environment factors was tested. Group processes were included as a possible mechanism through which the unit context impacted the rate of patient falls and staffing was used as a control variable. Together, these strategies were intended to better isolate the effect of the empowering work environments on the rate of patient falls using a unit level of analysis.

A second risk-oriented patient outcome selected for the study was a more generalized measure that included the nurse's appraisal of the frequency of occurrence of other common adverse events i.e. medication errors, nosocomial infections, complaints from the patient and/or family as well as patient falls with injuries. As noted earlier, a structurally empowering work environment is characterized in part by adequate resources to support the completion of required patient care. If there are inadequate resources, the level of care and surveillance may be insufficient to prevent adverse events. The relationship between the quality of work environment and adverse events has been supported in several studies. In a five-country study of nursing work environments, the authors concluded that the current poor working conditions for nurses and inadequate staffing were important predictors of patient adverse events (Aiken et al., 2001). A sub-

analysis of Canadian nurses from this study yielded similar results (Laschinger & Leiter, 2006). Work environment characteristics inclusive of strong leadership, nurse-physician collaboration, involvement in setting policies, a nursing model of care and adequate staffing had both direct and indirect negative effects on the rate of adverse events reported by nurses.

Sochalski (2001) concluded that the perspective of the health care provider is an important source of information when judging the quality of patient care. Other investigators have found a high level of concordance between nurse-assessed fall rates and those obtained from incident reporting systems (Cina-Tsumi, Schubert, Kressig, Geest & Schwendimann, 2008). In this Swiss study of 21 medical and surgical units, nurse estimates of falls over the last year when compared to hospital databases were significantly correlated for injurious ($r=.69$, $p<.01$) and non-injurious falls ($r=.63$, $p<.03$). Based on the data from Alberta for the five-country study, the investigators acknowledged that while nurses' views on the occurrence of adverse events was a crude measure of risk, these views still served to reflect important trends and can be used as an indirect measure of patient care quality (Giovanetti, Estabrooks & Hesketh, 2002).

In summary, work environments that reflect the key dimensions of structural empowerment theoretically lead to one's ability to work effectively. Nurses who have the support of their manager, opportunities to use and develop their skill set, access to information to assist in decision making and adequate resources are better able to deliver quality care as evidenced in patient outcomes. These conditions could potentially support effective team work characterized by workload sharing, communication and cooperation, mutual support and team spirit. Together, these group processes can serve as a mechanism through which quality outcomes are achieved. It was reasoned that by using

multiple valid indicators of both quality and risk patient outcomes, there may be a greater likelihood of obtaining a measureable effect of work environment conditions on patient outcomes.

Effects of Work Environments on Nurse Outcomes

The quality of the work environment impacts outcomes experienced by patients as well as the nurses working within these settings. In view of the global nursing shortage, the need to retain experienced staff has become an important organizational priority. By understanding the effect of work environments on nurse attitudes and behaviours that are relevant to staff retention, organizations can then introduce strategies to correct work environment deficiencies. Psychological empowerment, job satisfaction and nurse-assessed quality of patient care were selected as key nursing attitudes that have been associated with job retention. Empowered behaviour was theorized as a potential mediator as nurses seek roles that enable participation in decision-making and problem solving thereby enhancing job satisfaction and the delivery of quality nursing care. The literature and research related to each nursing outcome are described next.

Psychological empowerment.

Spreitzer (1995/1996) suggested that structural conditions alone do not result in the experience of empowerment. It is the reaction to these conditions that generates a psychological response whereby the individual interprets their work as having impact and meaning. The motivational potential of empowering conditions also includes the individual's perception of competence or self-efficacy whereby they believe that they are able to meet the demands of the job. The final dimension of psychological empowerment includes the sense of self-determination or feeling a sense of control over one's work

activities. Therefore, employees who perceive higher levels of psychological empowerment from their work are more motivated to perform within their role.

An individual may be more or less empowered depending on the task, their role and the situation. Spreitzer (1996) concluded that the individual's perception of their work environment shapes the experience of empowerment rather than simply the existence of structural factors. Structural and psychological models of empowerment are complementary models. Both share the assumption that structure influences behaviour and that behaviour is adaptive suggesting that changes in the workplace can create changes in behaviours. In early studies of psychological empowerment, access to information and reward structures, as proposed in Kanter's structural model of empowerment, were found to be antecedents to psychological empowerment (Spreitzer, 1995, 1996). Direct and indirect effects of psychological empowerment on nurse outcomes are discussed later in this chapter.

Empowered behaviour.

While the relationship between empowered nursing workplaces and work effectiveness has been established, the mechanism by which this occurs has not been elucidated. Laschey (2000) argued that employee empowerment is a multi-stage process whereby structural changes to the work environment may lead to employees feeling empowered, that feelings of personal efficacy may change work behaviour and these empowered behaviours may lead to improved business performance. He recommends that any analysis of empowerment needs to examine all of these stages as one stage does not automatically lead to the next. Various authors allude to what is considered empowered behaviour but few have attempted to directly measure these behaviours. Descriptions of empowered behaviour have generally included the following: taking more responsibility

and initiative, making decisions without having to ask, using more discretion about their tasks or the sequence in which they are completed, doing a task well in a self-directed manner in one's own way and time, taking risks that expose one's vulnerabilities with the expectation of no negative repercussions, questioning unnecessary procedures and changing them to improve work rate and quality of service, finding creative solutions to problems, and discussing issues openly and promoting new ideas at work (Irvine, Leatt, Evans & Baker, 1999; Johnson & Thurston, 1997; Kuokkanen, Leino-Kilpi & Katajisto, 2003; Laschey, 1999/2000; Mabey & Skinner, 1998).

The empirical work on empowered behaviour has been conducted primarily by a group of researchers from Finland. Suominen, Leino-Kilpi, Doran and Puuka (2001) studied a large sample of staff nurses working in intensive care units (ICU) to identify their use of various types of empowered behaviour and the relationship of these behaviours to background factors. In this study, the nurses often engaged in verbal empowerment (expressing opinions, making decisions) and behavioural empowerment (identifying problems that needed to be solved, recommending solutions) although they were less confident with outcome empowerment types of behaviours (solving the problems and making improvements). Work motivation and job satisfaction was significantly related these forms of empowered behaviour (p=.02-.002 and .008-.0001 respectively). A related study of nurse managers was conducted in 2005 by the same investigators. The managers engaged in verbal and behavioural empowerment more so that outcome empowerment, similar to the ICU nurses (Suominen, Savikko, Puuka, Irvine Doran, & Leino-Kilpi, 2005). In this study, work motivation and work satisfaction were also found to be positively related to empowered behaviour (p=.05 and .003 respectively). In a multidisciplinary sample from a single hospital, the results were consistent for the

rank order of types of empowered behaviour as well as the significant association with work motivation (p=. 03) but not job satisfaction (p=.12; Suominen, Savikko, Kukkurainen, Kuokkanen & Irvine Doran, 2006). This body of work provides evidence of the use of empowered behaviours by nurses in direct care and manager roles and indicates that these behaviours are related to motivational conditions and job satisfaction.

Beyond Finland, additional study of these relationships for nurses is needed to further validate the findings described above. Psychological empowerment was considered another plausible way to measure the motivational conditions within the workplace as a possible antecedent to empowered behaviour. The current study was designed to address these gaps by investigating the relationship between feeling empowered and acting empowered. To date, there have not been any studies examining the stages of empowerment explicating the link between psychological empowerment, behaviours that are representative of one who feels empowered and consequently work outcomes related to these behaviours.

Concomitantly to the implementation of this study, an integrated model of nurse/patient empowerment was proposed by Laschinger, Gilbert, Smith and Leslie (2009). In this expanded model, the authors postulated that nurses who have access to empowering conditions and feel more psychologically empowered are then more likely to engage in empowering behaviours that, in turn, leads to greater patient empowerment and thus better health outcomes. It has been shown that more empowered leaders have more empowered staff suggesting that empowerment begets empowerment (Haugh & Laschinger, 1996). Following this logic, nurses who experience higher levels of empowerment are more likely to use empowered behaviours to create empowering conditions for patients such as providing more access to information, support and

resources to facilitate the patient achieving their health goals (Laschinger et al.). The current study offered an initial attempt to test the majority of the hypothesized relationships in the nurse/patient empowerment model i.e. between structural and psychological empowerment, empowered behaviours and patient outcomes. The proposed relationship to patient empowerment was not included in the current study.

Job satisfaction.

Characteristics of the work environment that are associated with nursing job satisfaction include some of the key dimensions of structural and psychological empowerment. McNeese-Smith (1999) conducted a qualitative study of acute care nurses to determine factors that created job satisfaction and dissatisfaction. They found that the environment, pace and variety of patients in acute care, professional opportunities, a balanced workload and the ability to meet patients' needs influenced job satisfaction. In an meta-analysis of 48 studies of job satisfaction experienced by nurses in direct care roles, Blegen (1993) found that autonomy was moderately correlated with job satisfaction (r=.42). This finding is consistent with a more recent meta-analysis of 17 studies that were reported between 1991 and 2003 where the correlation between autonomy and job satisfaction was .30 ($p<.01$) (Zangaro & Soeken, 2007). Shields and Ward (2001) evaluated antecedents to job satisfaction among 9, 625 nurses in England, most of whom working in medical and surgical settings, and found that the largest contributor to job satisfaction was the opportunity for training and development as well as positive reinforcement and encouragement, both of which reflect dimensions of structural empowerment. For nurses who placed a higher value on non-monetary aspects of their job, feeling that their work was rewarding (meaningful) had the largest impact on job satisfaction. In another study of acute care nurses in the United States, a supportive work

environment and the type of unit (critical care versus medical-surgical) accounted for 55% of the variance in job satisfaction (Kangas, Kee & McKee-Waddle, 1999).

The importance of job satisfaction as an outcome of nursing work environments is reflected in its association with turnover intentions. In the Shields and Ward study (2001), job satisfaction was the most significant predictor of intentions to quit and nurses who were very dissatisfied were 65% more likely to have intentions to quit than those feeling satisfied. Using an economic analysis of the data, the authors predicted that policy initiatives that could impact dissatisfied nurses and change their opinions to a more neutral view (neither satisfied nor dissatisfied with their job), would result in the retention of 6.8% of their workforce (30,828 nurses) with a cost savings of 76 million pounds. Tourangeau and Cranley (2006) tested a theoretical model of various determinants of nurse intentions to remain employed using a large sample of medical, surgical and critical care nurses from Ontario. Overall job satisfaction was the strongest predictor of nurse retention (β=.18, $p<.001$). Job satisfaction was therefore deemed to be an important nursing outcome affected by quality of the work environment.

Nurse-assessed quality of nursing care.

The overall goal of nursing is to provide quality care. The standards by which nurses judge the quality of care reflect professional, legislated and organizational standards. The nurse then integrates these quality standards into an overall personal judgment of the quality of nursing care delivered. Nurse-assessed quality of care may reflect a balance between the care that was intended to be given and the care that was able to be given while working within the constraints of the work setting. When the nurse is unable to complete all of the care activities that they value as important, a less positive view of the quality of nursing care may result. The validity of nurses' assessments of

quality care was supported by findings from a statewide study of acute care nurses. Sochalski (2004) found that 43% of the variance in nurse-assessed quality of care was accounted for by nursing tasks that were not completed due to lack of time (e.g. patient teaching and counseling, skin care, documentation and discharge planning) as well as the occurrence of medication errors and patient falls. Unlike patient-assessed quality of nursing care, the patient is not likely to be aware of professional standards for care delivery and is reacting primarily to how well their personal expectations were met. The gap that exists between nurses' and patients' expectations for selected aspects of care has been well articulated in many studies and reinforced by findings in the study by Young, Minnick and Marcantonio (1996). In this study of nurses, nurse managers and patients from 97 medical and surgical units within 17 hospitals, a difference was found in the value placed on various aspects of care by patients as compared to nurses and their managers. Nurse-assessed quality of care is therefore conceptually different from patient satisfaction and offers a complementary view of quality.

In a larger five-country study of nurses working in medical and surgical settings, Aiken, Clark and Sloan (2002) found that nurses were twice as likely to rate the quality of nursing care as poor to fair when they experienced the lowest level of support from their organization. Similarly, Laschinger (2008) studied a group of Ontario nurses working in large urban hospitals and found structurally empowering work environments had a small but significant effect (β=.27) on nurse assessments of the quality of care that they provided. Therefore, nurse-assessed quality of care is an important outcome to monitor as a consequence of the quality of the work environment.

Direct and indirect effects of psychological empowerment.

This study intended to examine how psychological empowerment influenced the selected nurse outcomes directly and indirectly through empowered behaviours. Direct effects of psychological empowerment on job satisfaction and quality of care are described first followed by a discussion of indirect effects on these outcomes.

As described earlier, nurses are motivated to perform in their role in part by feeling that their work is meaningful and has impact, that their role affords a level of autonomy when making decisions about their work and when they feel a sense of self-efficacy or competence to manage their work demands. As such, these components of psychological empowerment have the potential to enhance job satisfaction arising from good role performance. The motivation to perform well should also be manifested in the quality of care delivered and likewise reflected in the nurses' assessments of the quality care.

The direct effects of psychological empowerment were first examined in 2001 as part of research on nursing workplace empowerment conducted by Laschinger. Psychological empowerment was investigated as a mediator between structural empowerment and an assortment of outcomes related to job attitudes (job and work satisfaction, burnout, commitment, and trust). For job satisfaction specifically, the positive relationship between structural empowerment, psychological empowerment and this nursing outcome has been consistently demonstrated across numerous studies. In the first study, the direct relationship between structural and psychological empowerment was tested using a sample of proportionate numbers of male and female nurses from urban tertiary care hospitals (Laschinger, Finegan, Shamian & Wilk, 2001). Structural empowerment had a large effect on psychological empowerment (β=.85) and psychological empowerment, in turn, had a large effect on job satisfaction (β=.79). Using

a longitudinal design, investigators tested the impact of changes in structural and psychological empowerment over a three year period on changes in job satisfaction (Laschinger, Finegan, Shamian & Wilk, 2004). The results were similar adding further validity to structural empowerment as an antecedent to psychological empowerment (β=.42) although there was no significant effect of changes in psychological empowerment on job satisfaction. In a study of work environments for first-line and middle managers, a moderate direct effect of structural empowerment on psychological empowerment (β=.42) was again observed along with a direct relationship to job satisfaction (β=.29) (Laschinger, Almost, Purdy & Kim, 2004). Therefore, there is a body of evidence supporting psychological empowerment as a predictor of job satisfaction as well as structural empowerment as an antecedent to psychological empowerment. These studies included an examination of these relationships occurring at the individual level.

No published literature testing the direct effect of psychological empowerment on nurse assessed quality of care was found. The majority of studies have focused on structural characteristics of the nursing workplace using either an empowerment or a professional practice environment framework, the latter of which was used predominantly in research on magnet hospitals. The current study offered an opportunity to examine the psychological factors that may also contribute to nursing assessments of quality care.

Less attention has been paid to the possible additional contribution of indirect effects or mechanisms by which psychological empowerment leads to these nurse outcomes. As nurses experience a greater sense of self efficacy or mastery in their work and are afforded greater autonomy in their role, it is more likely that they will have the motivation to actively engage in problem-solving. Similarly, if the nurse feels that work has an impact and meaning, they may have the confidence to use empowering behaviours.

As the nurse experiences success by using empowered behaviours for the benefit of the patient and the unit then a greater sense of personal satisfaction with their job can result. In two national studies of nurse job satisfaction in the United States, opportunities to influence decisions in the workplace were associated with satisfaction with one's nursing career (Buerhaus, Donelan, Ulrich, Kirby, Norman & Dittus, 2005). Similarly, Shields and Ward (2001) identified that involvement in decision making accounted for differing levels of job satisfaction between nurses who intended to stay versus leave the organization. These studies offer beginning support for the contention that nurses who are motivated to engage in empowered behaviours may also experience increased levels of job satisfaction.

To engage in empowered behaviours, there needs to be both the opportunity and the personal motivation to go above and beyond what may be considered the minimum standard for performance. Accepting that nurses who feel psychologically empowered are more motivated to employ empowered behaviours, it is the actual behaviours i.e. proactive problem solving, that serves as the means by which improvements in the nursing care are realized. Behaviours representative of acting empowered were similar to those defined as innovative behaviour by Knon and van Linge (2009) e.g. identifying problems, generating new ideas, mobilizing support for new ideas and realization of ideas. In a study of acute care nurses in Holland, the researchers found a large correlation ($r=.53$, $p<.01$) between psychological empowerment and innovative behaviour (Knon & van Linge). Structural empowerment, partially mediated through psychological empowerment, accounted for 34% of the variance in innovative behaviour in these nurses. Therefore, the similarity between behaviours associated with empowerment and innovation suggests that psychological empowerment may serve as a potential antecedent

to acting empowered. In addition, empowered behaviors could the mechanism through which psychological empowerment leads to higher levels of nurse-assessed quality of care. The proposed contribution of both direct and indirect effects of psychological empowerment on these nurse outcomes were examined in the current study.

Contextual Cross-level Effects

The majority of studies examining empowerment in nursing are based on cross-sectional studies where subjects are recruited randomly from lists obtained from a professional registry. What is missed in this approach is the contribution of contextual effects arising from characteristics of specific work units or groups that may impact relationships between empowering conditions and outcomes for nurses and patients. When studying organizational behaviour, Johns (2006) argues that the influence of context is often unrecognized or underappreciated.

The influence of context can be captured in two ways. First, data collected or aggregated at the group level allows for the examination of differences between patient care units on selected contextual variables and their subsequent impact on outcomes of interest. In the current study, differences in structurally empowering factors between units were analyzed for their effect on group processes and patient outcomes. As such, structural empowerment was treated as a group-level construct reflecting the shared perceptions of the group members' views of access to structurally empowering factors in the workplace. Other multi-level studies of empowerment have used the psychological view of empowerment as the group-level construct. Mathieu, Gilson & Ruddy (2006) found that psychological empowerment, as mediated by team processes, accounted for differences in customer satisfaction and other performance measures all of which were measured at the group level. The empowerment-performance link was also supported at

the group-level in a study of teams within a home improvement company (Chen, Kirkman, Kanfer, Allen & Rosen, 2007). For teams whose work was more interdependent in nature, there was a significant positive relationship between team empowerment and team performance (β=.55, $p<.05$).

Second, contextual effects of differences between units were investigated by analyzing cross-level effects on individual nurse attitudes and behaviours. Kozlowski and Klein (2000) point out that contextual, or group-level variables, may also have direct effects on individual-level attitudes and behaviour or could moderate relationships between lower-level variables. By employing a multilevel design, it was possible to analyze the variation in individual nurse attitudes arising from group-level contextual variables. For the current study, two cross-level effects were investigated: first, the extent to which structurally empowering workplaces contributed to the individual-nurse psychological empowerment, and second, the moderating effect of group processes on the relationship between psychological empowerment and empowered behaviour was studied.

To date, there has been one study of nursing work environments that specifically examined the role of group-level structural empowerment on individual-level psychological empowerment (Laschinger, Finegan & Wilk, 2009). In this large provincial study of acute care nurses from 217 units, group-level structural empowerment exerted a large cross-level effect (β=.67) on psychological empowerment. Group-level structural empowerment also had both direct and indirect effects on the nurse attitude of commitment as mediated by psychological empowerment (Laschinger, Finegan & Wilk). Outside of nursing, investigators have tested structural empowerment factors operating as a macro-level contextual variable influencing individual employee's feelings of

empowerment (Seibert, Silver & Randolph, 2004). The investigators argued that the combination of various types of structural factors form a single construct of empowerment climate that operates at the level of the work-unit. Empowerment climate was defined as the shared perception about the degree to which the organization uses structures, policies and practices to enhance employee empowerment. Initial support for this hypothesis was obtained from a multi-level study of product team members in a high-tech office and printing company. Group-level empowerment was positively and significantly related to group-level performance but also predicted individual-level performance and job satisfaction as mediated through psychological empowerment. Further examination of structural empowerment as a group-level construct was warranted to expand upon these early studies and extend our current understanding of the effects of nursing work environments on a wider variety of nurse outcomes.

A second cross-level effect was proposed to attempt to explain the influence of group processes on the relationship between psychological empowerment and empowered behaviour. It was hypothesized that group processes could moderate the relationship between feelings of empowerment and the expression of empowered behaviour at an individual level. Johns (2001) maintains that situational or contextual variables serve to provide both opportunities and constraints on attitudes and behaviours in organizational settings. Mabey and Skinner (1998) suggest that one's sense of empowerment at an individual level and resulting behaviour is influenced by the social group to which one belongs and the level of resources and supports that are provided by the group. In their study of junior managers and clerical staff from a service industry, the team was viewed as critical to encouraging empowering behaviour since team members were seen as a source of confidence and afforded an opportunity to discuss and resolve problems as a

team without having constantly refer to higher management. In the setting of nursing work teams, support, workload sharing, communication and cooperation offered by team members can promote the individual expression of empowered behaviour. Alternatively, groups that are dysfunctional, may discourage the opportunities for nursing members of the team to engage in empowering behaviours e.g. would not share workload in such a way as the nurse can engage in problem-solving activities to address work-related issues. It is possible then that work group processes can moderate the relationship between feelings of empowerment and the expression of empowered behaviour at an individual level. By employing a cross-level design, examining the impact of the work group on individual behaviour can extend our understanding of the stages of empowerment.

Therefore, there was initial but limited evidence to support structural empowerment as a group-level construct predicting group-level performance as well as exerting cross-level effects on individual outcomes such as job satisfaction. A fruitful next step in exploring empowerment was to identify the contextual effects of group-level empowerment on other group-level indicators of work effectiveness as well as on individual attitudes and behavior within the healthcare context.

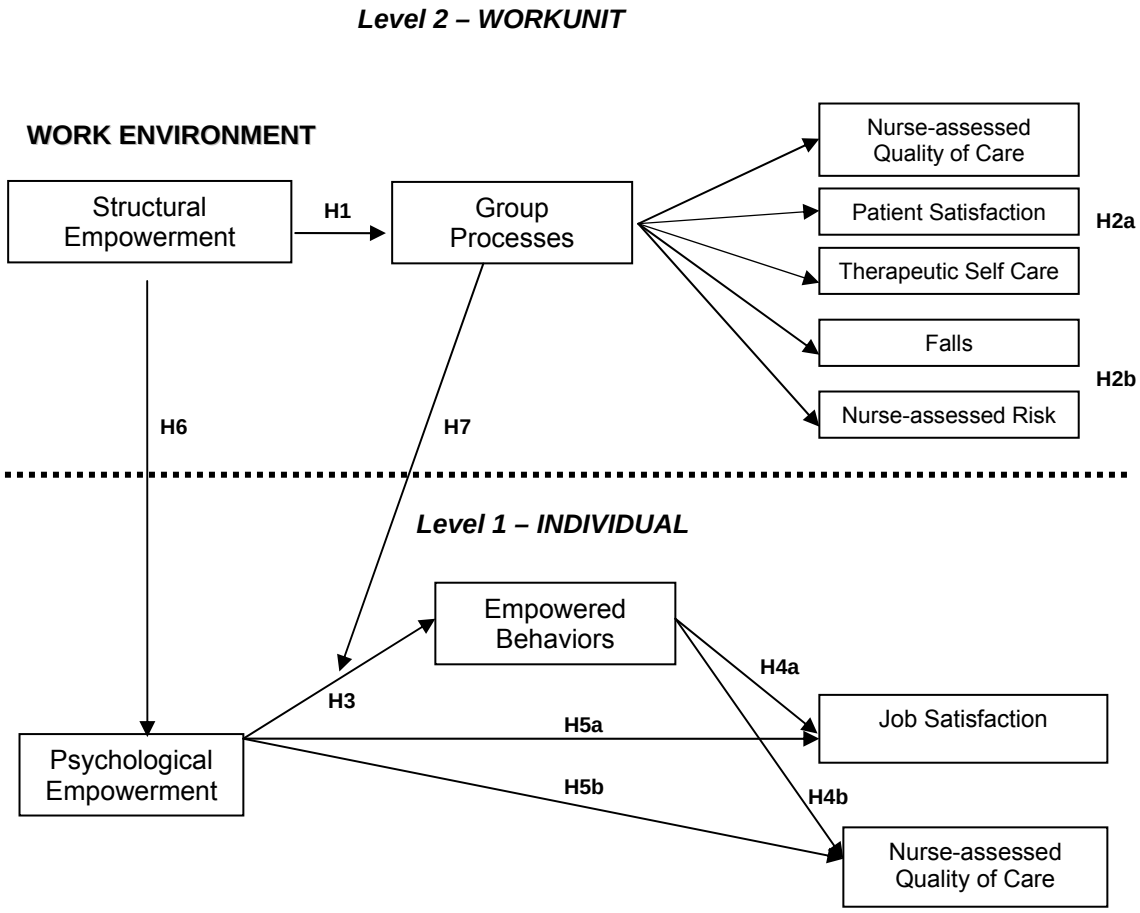
Hypothesized Study Model

Based on the literature reviewed above, the current study was designed to provide a comprehensive and integrated examination of the effects of work environments on nurse and patient outcomes. The identified gaps in the research were addressed by using a multi-level design with the inclusion of mediating mechanisms to better understand the means by which empowered workplaces impact quality and risk outcomes. The proposed relationships between the variables discussed were combined into the hypothesized model for the study.

It was hypothesized that structurally empowering work environments would not only have a positive effect on group processes but that group processes would mediate the relationship between structural empowerment and quality-oriented patient outcomes (patient satisfaction and therapeutic self care) as measured at the group level. Group processes were also considered to negatively mediate the relationship between structural empowerment and risk-oriented patient outcomes (patient falls, nurse-assessed risk). At the individual level, feelings of psychological empowerment were hypothesized to have direct and indirect effects on nursing job satisfaction and nurse-assessed quality of care as mediated through empowered behaviours. Given that contextual variables operating at the group level can have direct effects on individual-level attitudes and behaviour, two cross-level effects were proposed. Group-level structural empowerment was hypothesized to have a positive effect on individual-level psychological empowerment and thereby increase the use of empowered behaviours. As well, group processes at the unit level were conceived to moderate the relationship between psychological empowerment and empowered behaviours. The hypothesized relationships are summarized in Figure 1.

Figure 1

Hypothesized Study Model of Work Environment and Patient/Nurse Outcomes



Based on this study model, the following hypotheses have been formulated:

Unit-level hypotheses:

1. Team-level structural empowerment has a positive effect on group processes (H1).
2. Group processes positively mediate the relationship between team-level structural empowerment and quality-oriented patient outcomes (patient satisfaction and therapeutic self care-H2a) and negatively mediate the relationship to risk-oriented patient outcomes (patient falls and nurse-assessed risk-H2b).

Individual level hypotheses:

3. Perceptions of psychological empowerment are positively related to empowered behaviour (H3).
4. Empowered behaviour mediates the relationship between psychological empowerment and perceptions of the quality of patient care delivered (H4a) and nurses' job satisfaction (H4b).
5. Perceptions of psychological empowerment are positively and significantly related nurses' job satisfaction (H5a) and to the quality of patient care delivered (H5b).

Cross-level hypotheses:

6. Team-level structural empowerment is positively related to individual-level psychological empowerment (H6).
7. Team-level group processes positively moderate the relationship between individual-level psychological empowerment and empowered behaviour (H7).

Summary

In this chapter, arguments were provided to support the proposed relationships between empowering work environments for nurses, group processes and thereby work effectiveness as reflected in patient outcomes and concurrently, the effects on individual nurses' psychological empowerment, engagement in empowering behaviours and ultimately the quality care for patients and job satisfaction for nurses. Theoretical and empirical support for these arguments were described. Gaps in our current knowledge of these concepts included the consideration of structural empowerment as a group-level construct, and the mediating role of group processes in achieving patient outcomes. In addition, the study addressed the role of empowered behaviours on nurse outcomes,

provided an initial test of the integrated model of nurse-patient empowerment, and examined cross-level effects of structural empowerment on individual nurse job attitudes and behaviour. To summarize the proposed relationships, a multilevel model outlining the hypothesized effects of empowered work environments on nurse and patient outcomes was described. Methods used to test the study model are detailed in the next chapter.

Chapter 3

Methods

The design and methods used to collect and analyze data are described in detail in this chapter. First, sample size determination and the subsequent sample and setting for the study are described. The data collection process is elucidated and instruments used to measure study variables are listed along with a discussion of the associated psychometric properties to support the validity and reliability of these measures. Next, data management strategies used to assess data integrity, missing data, tests for aggregation and justification for cross-level hypotheses are described. This is followed by a review of the ethical considerations and limitations of the data collection process. The chapter concludes with a summary of the overall approach to methods used for this study.

Design

A multilevel multi-site non-experimental design was used to test the hypothesized study model. This design was selected to determine the impact of variations in the quality of the workplace at the inpatient unit level on nursing and patient outcomes across organizations of varying sizes and geographic regions. Convenience sampling was used. Additional data was collected to describe the sample and determine the representativeness of this sample to the larger population of nurses and patients who work or receive care in acute care hospitals.

Sample Size

The sample size was based on the use of multilevel structural equation modeling (MLSEM) for the statistical analysis. The sample of nurses and patients was selected by their association with a specific patient care unit, i.e. the observations were not independent. To determine if the variation in patient outcomes was due to contextual

characteristics, data gathered at the individual level were aggregated to the group level to analyze the Level 2 component of the model. Usually a minimum sample size of 200 is required for statistical analysis using structural equation modeling (SEM; Kline, 2005) although this is less feasible when the sample consists of groups. In the context of multi-level modeling, Maas and Hox (2005) suggest that a sample size greater than 50 at the group level will not lead to biased estimates of standard errors, regression coefficients or variance components. Meuleman and Billiet (2009) recommend that if the group-level model is relatively simple then only 40 groups could be sufficient but this will vary depending on the anticipated effect size. They note that over 60 groups are needed to achieve the power to detect large effects and further increases in number are necessary when attempting to detect small to medium effects. Muthén and Muthén (2002) advise that the amount of missing data, the reliability of the variables and the strength of the relationships among the variables will also influence the sample size necessary for unbiased estimates and power. Therefore, the sample size was set at 100 units for statistical purposes and feasibility considerations. Assuming a minimum of 10 nurses for each of the 100 sites, the estimated sample of Level 1 cases (1,000) would exceed the minimum needed for SEM.

The size of each patient care unit was expected to vary significantly across hospitals resulting in great variation in both the number of eligible nurses and patients available for sampling. All nurses meeting inclusion criteria were invited to participate given the likelihood that the number of potential and the number of required nurses from each unit could essentially be the same.

Setting and Sample

Data were collected from nurses and patients scheduled for discharge from medical and surgical units. The sampling frame consisted of small (rural), community, and teaching hospitals (>70 beds) that provided adult acute care in Ontario, Canada. Some hospital organizations had multiple sites of varying sizes e.g. community and rural hospital campuses. A list of eligible hospitals was prepared from online resources describing hospitals within each Local Health Integration Networks (LHIN) regions within the province. Upon receiving ethics approval from the university (Appendix A), initial contact was made with the Chief Nurse Executive of selected hospital organizations. An invitation to participate, executive summary and fax-back form of agreement were distributed by mail (electronic and fax copy) (Appendix B). A phone follow-up and/or personal meeting was conducted to ensure questions were answered satisfactorily before the agreement to proceed was provided. In some organizations, meetings were also held with the nurse management team and/or nursing council to obtain their agreement to participate in the study. Application to each hospital's research ethics board was made (n=25) and approval obtained prior to contacting the managers of the patient care units.

Chief Nursing Executives (CNEs) from 48 organizations were approached and 25 (52%) agreed to conduct this study. Details regarding the eligible and participating hospitals are found in Table 1. CNEs who declined the offer to participate cited workload issues (78%) as the primary reason for refusal. Due to the length of time that had lapsed to obtain CNE and site-specific ethics approval across all eligible hospitals, data collection was considered complete after 87 units were enrolled instead of the original 100 units as initially proposed.

Table 1

Hospital Response Rate

Hospital Type	Participated	Declined				Total
		Workload issues	*Patient survey issues*	*No reason provided*	*No response to calls*	
Community	10	16		1	1	28
Large Community	4	1	2	1		8
Teaching	11	1				12
Total	25	18	2	2	1	48

Of the 87 units involved in the study, seven were deleted because no patient data were returned. An additional four units were removed if there was only one survey returned per unit. Another 11 units were deleted due to missing data on a key control variable, staffing (hours per patient day). The final sample consisted of 61 inpatient units: 25 medical (41%), 28 surgical units (46%) and 8 (13%) combined medical-surgical units (refer to Table 2).

Table 2 Unit Characteristics (Final Sample)

Hospital Type	Medical Units	Surgical Units	Med-Surg Units	Total
Rural	3	1	7	11
Community	15	10	1	26
Teaching	7	17	0	24
Total	25	28	8	61

Inclusion/exclusion criteria.

Participants in this study were nursing staff and admitted patients from the selected units. All Registered Nurses (RNs) and Registered Practical Nurses (RPNs) were invited to participate if they were employed directly by the hospital in the role of direct care provider and worked on a full or part time basis on the unit for a minimum of one year. Nurses were excluded if they were on a long term absence due to illness or maternity leave (greater than 6 months in the past year), were employed on a casual or

temporary basis (agency nurses), had non-direct care roles or had already completed a survey due to their employment on multiple units within the same hospital.

Patients were requested to participate if they were adults (over the age of 18 years), spoke and/or read English or French (unless a family member could assist), were admitted to the selected medical and/or surgical unit with at least 50% of their stay occurring on this unit and a minimum length of stay of two days and were scheduled to be discharged from hospital to home within the upcoming 24 hour period. Patients were excluded if they were to be discharged within the one hour.

Recruitment.

The Chief Nursing Officer forwarded a list of names of the medical and surgical units (excluding critical care and step-down units), and the names and work contact information for the respective nurse managers as well as the individual responsible for quality and risk management who would provide the falls data (Appendix B). Many organizations were unable to include all available units due to ongoing project commitments that would prevent successful participation in the study. A letter of information and an executive summary (Appendix B) was then distributed to each of managers by email. Follow-up phone-calls were made to respond to questions and to negotiate dates to launch the study.

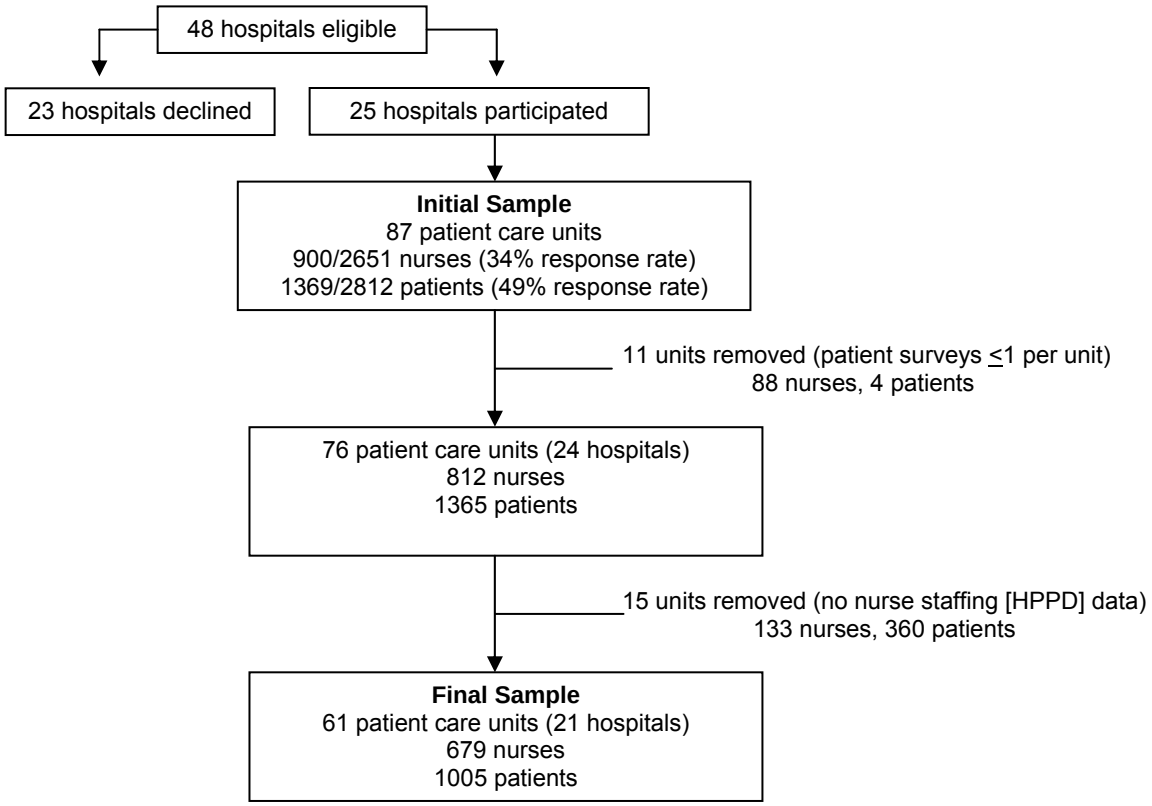
Nurse managers were sent posters and a standardized email message for staff to provide key messages regarding the study e.g. purpose, anonymity, start and end dates, contact information for the researcher, their role in the study, etc. (Appendix C). The nurse manager then prepared a list of names of RNs and RPNs employed on the unit who met the inclusion criteria (Appendix D). The number of nurses to be included in the sample was communicated to the researcher so that the appropriate number of nurse

surveys could be assembled in advance. The investigator visited each unit on two occasions to present an overview of the study to the nurses (10-15 minutes in length). Approximately 748 nurses attended the information sessions.

The final sample consisted of 900 registered nurses (RNs) and registered practical nurses (RPNs) (response rate 34%) and 1369 patients (response rate 49%). For units that did not provide complete patient data, cases associated with these units were deleted from the sample (221 nurses, 364 patients) as summarized in Figure 2. The final sample therefore included 679 nurses and 1005 patients.

Figure 2

Initial and Final Sample



Data Collection

Nurses.

The nurse manager (or designate) added names of eligible nurses to each nurse survey package to ensure confidentially of employee information. Nurses meeting the inclusion criteria were provided the survey package that included a letter of information, an invitation to participate in the study, a survey that could be completed using the printed copy or online version to accommodate their preferences as well as a stamped self-addressed envelope. Completed nurse surveys were sent to the researcher through regular mail. Surveys completed online were held on a secure server at the university and SPSS data files were sent to the investigator at regular intervals throughout the study. For those not able to attend the session, survey packages were placed in unit-based mail systems or left in the lounge area. Individual nurse surveys contained a unique user code, password and web address to locate the online survey. The user code identified the unit and the hospital where the nurse was employed for purposes of statistical analysis. Access to the online survey was maintained until the completion of the study across all sites. To increase response rates, reminder messages were sent to the nurse managers for distribution to the nursing staff via email (or posting) at week 1, 3 and 4 (Schaefer & Dillman, 1998) while maintaining the anonymity of the nurses on each unit (Appendix C). Surveys were completed privately in approximately 15-20 minutes during their personal time at work or at home (Appendix E).

An incentive to encourage participation included a draw prize of a $100 cheque for nurses and for patients (10 prize-winners per each group, odds of winning approximately 1/250 if 25 nurses/patients from each unit and 100 units participated in the study) (Deutskens, DeRuyter, Wetzels & Oosterveld, 2004; Goritz, 2005) . Refer to Appendix F

for the draw entry forms distributed to patients and Appendix E for nurses. As a token of appreciation, nurses received a refrigerator magnet (with the phrase "Nurses make a difference in someone's life every day") in their survey packages (approximate value $.50).

The majority of nurses worked in community (46%, n=315) and teaching hospitals (37%, n=248). Within these settings, there were slightly more nurses employed on surgical units (50%, n=341) than medical units (37%, n=252). Combined medical-surgical units were found primarily in non-teaching hospitals (13% of total sample, n=8) and 86 nurses (13%) were included from this setting. There were between 2 and 31 nurses responding from each patient care unit ($\overline{X}$ =11.13, Standard Deviation (SD) 5.10). Details are provided in Table 3.

Table 3

Number of Participants by Type of Hospital and Unit

Hospital Type	Unit Type	Number of Units	Number of Participants				Mean Number of Participants per Unit	
			Nurses		Patients		Nurses	Patients
			N	%	N	%		
Small/rural	Medical	3	34	5	56	6	11.3	18.7
	Surgical	1	13	2	4	-	13.0	4.0
	Medical/Surgical	7	69	10	78	8	9.9	11.2
Community	Medical	15	155	23	226	22	10.3	15.1
	Surgical	10	143	21	268	27	14.3	26.8
	Medical/Surgical	1	17	3	38	4	17.0	38.0
Teaching	Medical	7	63	9	62	6	9.0	8.9
	Surgical	17	185	27	273	27	10.9	16.1
TOTAL		61	679	100	1005	100	11.1	16.5

Most nurses were female (96%), worked full time (75%) and were licensed as Registered Nurses (RNs) (83%). Nurses, including both RNs and Registered Practical Nurses (RPNs), were prepared primarily at the diploma/certificate level (n=532, 80%) while 19% had a baccalaureate degree in nursing (n=130). The majority of nurses received their education in Canadian schools of nursing (96%). On average, the nurses were 42 years of age, had been employed in their current role for 12 years and had been nursing for a total of 18 years. Only 8 nurses completed the survey in French although 5% (176) of the nurses were provided surveys in both official languages. Demographic characteristics of the nurses were similar to those reported by the provincial licensing board (Canadian Institute of Health Information [CIHI], 2010). Additional details of the demographics characteristics of the nurses are found in Table 4.

Table 4

Demographic Characteristics of Nurses

Variable	M	SD
Age	42.1	11.1
Years in current role	11.8	10.0
Years nurse experience	18.0	11.5
	N	**%**
License		
RN	550	82.6
RPN	116	17.4
Employment Status		
Full time	497	74.5
Part time	170	25.5
Gender		
Female	641	96.1
Male	26	3.9
Highest level nursing education		
Diploma/certificate	532	80.0
Baccalaureate degree	130	19.1
Graduate degree	3	0.4
Educated in Canada	538	96.4
Survey completed in French	8	1.2
Survey completed online	62	9.5

Note. M=mean, SD=standard deviation

Patients.

Patients survey packages were distributed by nurses employed by each unit. Surveys were given to eligible patients who were expected to be discharged from hospital within the upcoming 24 hour period. The nurses distributing the patient survey may or may not have provided direct care to the patient. Other alternative strategies were used for data collection on request of the nurse manager. These strategies were intended to reduce the workload of the nurse and ensure an adequate opportunity to collect patient data. Other individuals assuming the responsibility for the distribution and collection of completed patient surveys included people who regularly interacted with patients such as the charge nurse (1 unit), nurses working in a modified role due to health reasons (2

units), nurses involved in 'late career' initiatives (1 unit) or hospital volunteers (2 units). In one organization, the investigator was requested to obtain the patient survey data directly (4 units).

Information sessions were held with the individuals who had agreed to distribute the patient surveys. A brief script was provided to assist in communicating the nature of the study to the patient (Appendix G). The patient survey package contained a Letter of Information for Patients (Appendix H), a patient questionnaire and a pencil. Questionnaires were coded to identify the hospital, unit and subject number only. Between 25 and 50 packages per unit were made available (depending on the rate of patient discharges) and distributed to eligible patients identified for discharged after the start date for the study. Completion of the questionnaire by the patients indicated their consent to participate in the study. Patients kept a copy of the letter of information for their personal records and the pencil as a token of appreciation. Participants completed the questionnaire (approximately 10 minutes in length) or left it blank then sealed the envelope. Nurses collected the envelopes and placed them it in a secure area (determined by the Nurse Manager). After all of the patient survey packages were distributed and returned (or a maximum of one month had transpired), the Nurse Manager couriered the envelope of completed surveys to the investigator at the university (cost of mailing paid by the investigator). All data was secured in a locked cabinet accessible only the researcher.

The number of patients responding to the survey from each unit varied between 2 and 43 patients with a mean of 16.48 (SD=12.24). For the group offered the survey in both official languages, 3.2% completed the French version (n=14). There were slightly more females (n=524, 53.7%), the majority of patients were married (n=643, 66.2%) and the

average age was 61.4 years (SD=17.04). The mean length of stay in hospital was 8.11 days although there was great variability across the sample (SD=9.21, range 2-120 days). More patients rated their general health as good to excellent (55.1%, n=482), similar to their self-assessed health before this most recent hospitalization (52.9%, n=514). Patient characteristics were also similar to those in other Ontario-based studies of patient satisfaction with acute care (Brown et al., 2008; CIHI, 2007; Laschinger, McGillis Hall, Pederson & Almost, 2005). Details of the patient characteristics are found in Table 5.

Table 5

Patient Characteristics

Variable	**M**	**SD**
Age	61.44	17.04
Days in hospital	8.11	9.21
Variable	**N**	**%**
Gender		
• Female	524	53.7
• Male	451	46.3
Marital Status		
• Single	102	10.5
• Married/cohabitating	643	66.2
• Separated/divorced	81	8.3
• Widowed	146	15.0
General health		
• Excellent	46	5.3
• Very good	147	16.8
• Good	289	33.0
• Fair	284	32.4
• Poor	110	12.6
Health before recent hospitalization		
• Excellent	143	14.7
• Good	371	38.2
• Fair	224	23.1
• Poor	130	13.4
• Very poor	87	9.0
• Unsure	16	1.6

Note. M=mean, SD=standard deviation, N=number.

Unit profile and falls data.

The manager completed a brief unit profile describing general characteristics of the unit (Appendix E). The majority of the data requested in the unit profile was readily available from routine data reporting e.g. contained within the Nursing Management Information Systems (MIS) of Ontario hospitals. Falls data was provided by the individual responsible for quality and risk management within the organization.

The study was considered complete after all of the patient surveys had been returned, the unit profile submitted and falls data obtained for each patient care unit. The average amount of time the study was operational within a given unit was two months. Data collection began April 2007 and ended September 2008.

Instrumentation

The nursing and patient surveys were comprised of published standardized instruments. The instrument that was not available in the public domain was authorized for use by the authors (letters of approval found in Appendix I). A detailed description of the study variables and associated measures, including psychometric data, are summarized in the next section. The complete nursing and patient surveys are found in Appendix E. Within each survey, the discussion follows the order in which the variable being measured is presented in the study model as noted on page 41.

Nursing Survey.

The nursing survey included measures for variables that formed both group and individual-level hypotheses. At the group level, variables included structural empowerment, group processes, and nurse-assessed quality of care and risk. Support for aggregating the data to the unit level is presented within the data management section of

this chapter (page 72). At the individual level, variables included psychological empowerment, empowered behaviours, and job satisfaction and nurse-assessed quality of care. The final section of the nurse survey includes demographic data used to describing the characteristics of the sample.

Group-level variables.

Structural Empowerment.

Structural empowerment was measured using the Conditions of Work Effectiveness Questionnaire (CWEQ-II; Laschinger, Finegan, Shamian & Wilk, 2001). The 19-item questionnaire included six subscales to measure the various dimensions of structural workplace factors that are empowering (opportunity, information, support, resources) and sources of power (formal and informal power) that enhance access to these factors. Together, the sum of the mean of each subscale forms the variable "total empowerment" used to represent the quality of nursing work environment. A two-item global empowerment scale was included for construct validation purposes. Each item was measured using a 5-point Likert scale ranging from 1 (none), 3 (some) to 5 (a lot) such that a higher score reflected more empowering workplaces.

Based on Kanter's ethnographic study (1977) from which structural empowerment theory was developed, Chandler (1986/1991) adapted Kanter's original items to test the presence of empowering conditions within nursing work environments. Laschinger expanded the structural empowerment theory further and added measures related to the constructs of formal and informal power (1996). Subsequently, the instrument was revised further and shortened to the CWEQ-II based on confirmatory factor analyses (Laschinger, Finegan, Wilk & Shamian, 2000). The CWEQ-II has been used extensively in studies of nurses in direct care roles in various work settings in Canada and other

countries with consistently strong internal consistency (Laschinger, 2006). Cronbach alpha reliabilities have ranged between .78-.93 in studies conducted between 1996 and 2008 (Laschinger, 2009). The instrument has been shown to discriminate between levels of empowerment among nurses holding progressive leadership roles (Laschinger & Wong, 2007; Laschinger, 2004). In this study, the Cronbach alpha was .74-.94 for group-level dimensions of empowerment with the exception informal power at .61. The Cronbach alpha for total empowerment (summated score of all dimensions) was .82. Refer to Table 6 for a summary of reliability values for all instruments.

Table 6 Summary of Cronbach Alpha Reliability Results for Nurse-related Variables

Variable	Cronbach alpha - Group-Level
Structural empowerment (total empowerment)	.82
Opportunity	.87
Information	.94
Support	.74
Resources	.83
Informal power	.61
Formal power	.79
Global empowerment	.97
Group processes	.91
Interdependence	.76
Potency	.85
Support	.92
Share workload	.91
Communicate/collaborate	.87
Adverse events	.78
	Cronbach alpha - Individual-Level
Psychological empowerment	.64
Meaning	.91
Competence	.85
Autonomy	.84
Impact	.89
Empowered behaviour	.88
Behavioural empowerment	.78
Verbal empowerment	.86
Outcome empowerment	.89
Job satisfaction	.85

Group Processes.

Group processes that are a part of teamwork were assessed using the Work Group Characteristics Measure (WGCM; Campion, Medsker & Higgs, 1993). This instrument was developed from a comprehensive review of the literature on work group characteristics related to effectiveness (productivity and employee satisfaction) including job design, interdependence, composition, context and group processes. Five subscales were selected for this study including task interdependence and four other process-related group characteristics consisting of potency (team self-efficacy), social support, workload sharing, and communication/cooperation. There are 3 items per subscale, 15 items in total, and responses range from 1 (strongly disagree) to 7 (strongly agree).

The instrument was first tested in 80 groups of clerical staff and their managers from several business units of a financial services company. The Cronbach alpha reliabilities for the aforementioned subscales were between .64-.92 (Campion, Medsker & Higgs, 1993). Process-type group characteristics correlated primarily with productivity and manager judgements of effectiveness ($r=.18-.38$, $p<.05$) while potency (team efficacy) was significantly correlated with these outcomes as well as employee satisfaction ($r=.22-.38$, $p<.05$). These results were replicated in a study involving 60 teams of professional knowledge-based workers from the same company (Campion, Papper & Medsker, 1996). In the latter study, teams were an average size of nine members and were selected to provide variability in teamwork and empowerment as assessed by existing company survey data. Process-type work group characteristics were most highly correlated with the outcomes of employee satisfaction and productivity ($r=.24-.73$, $p<.05$) as in the original study. The other work group characteristic, task interdependence, was significantly correlated with all of the outcomes that were based on

the employees' assessment of satisfaction and effectiveness (r=.22-.33, p<.05). Cronbach alpha reliabilities were higher overall (.83-.92) for process-type characteristics subscales than for task interdependence (.70; Campion, Papper & Medsker, 1996). Therefore, the instrument was deemed relevant to work groups comprised of knowledge workers, such as nurses, and to the outcomes of interest (work effectiveness). For this current study involving nurses, the Cronbach alpha reliabilities were within acceptable limits for the total scale (r=.91) and individual subscales (r=.76-.91).

Nurse-assessed Risk.

Nurses' views regarding risk-related patient outcomes were measured using an instrument developed by Sochalski (2001) that was derived from the American Nurses Association (ANA) Nursing Quality Indicators (ANA, 1996, 2000). This scale is comprised of four items which assess nurse perceptions of the incidence of common risk-related patient outcomes over the past year. Nurses rated the occurrence of medication errors, nosocomial infections, complaints from the patient and/or family as well as patient falls with injuries on a scale from 1 (never) to 4 (frequently) . This scale has been used extensively in large national studies of nurses but psychometrics analyses have not been reported (Aiken, et al., 2001; Giovanetti , Estabrooks & Hesketh, 2002, Sochalski, 2004). In a study of Canadian hospital-based nurses, the Cronbach alpha coefficient of .75 was within satisfactory limits (Laschinger & Leiter, 2006) as it was for this current study (r=.78)

Nurse-assessed Quality of Care.

The Perceived Quality of Care on Unit instrument (Aiken, Clarke & Sloane, 2002) was used to capture the nurse's perceptions of quality-oriented patient outcomes. Three of the four questions asked the respondent to reflect on the quality of care on the unit while

the fourth question referred to changes in the quality of care across the organization over the past year. Since the level of focus for this study was the patient care unit, the fourth item was changed from 'organization' to 'unit'.

Separate ratings scales were used for each item i.e. excellent-poor (four-point scale) for the first two items, improved-deteriorated (three-point scale) for the third item and very confident-not at all confident (four-point scales) for the fourth item. Each of the four items has been used individually in several international studies of nurses and has been strongly associated with nursing work conditions and other patient outcomes (Laschinger, 2008; Sochalski, 2004). While the results for all four items are reported, only the first item indicating the nurses' assessment of overall quality of nursing care was used in the analysis of the study model. Sochalski argues that "a single global item could capture not only a broad set of attributes, but also the more intangible aspects of care that might not lend well to measurement no matter the length of the scale" (p. II-71). The aggregated score for this item was used for the Level 2 outcome variable and individual scores were used as a Level 1 outcome.

Individual-level variables.

Psychological Empowerment.

Spreizter's (1996) Psychological Empowerment Questionnaire (PEQ) assessed individual psychological empowerment. Both the measurement and analysis of this construct occurred at the individual level. The instrument includes 12-items which measure the four components of psychological empowerment: meaningful work, competence, autonomy, and impact. Responses to items range from 1 (strongly disagree) to 5 (strongly agree).This instrument has been used extensively with nursing subjects over the past decade and has been found to have acceptable reliability (Cronbach alpha

reliabilities ranging from .87-.92; Laschinger, Finegan, Shamian, & Wilk, 2004; Laschinger, Finegan, Wilk & Shamian, 2000). The proposed factor structure was further validated using confirmatory factor analysis in 2001 (Laschinger, Finegan, Shamian & Wilk). The Cronbach alpha reliability for the PEQ subscales was .84-.91 and .64 for the overall scale.

Empowered Behaviour.

The Empowerment Questionnaire (EQ; Irvine, Leatt, Evans & Baker, 1999) was used to measure nurses' self-rated empowerment behaviour in their work setting. Although respondents in the original version rated each item on a scale from no confidence at all (0) to complete confidence (10) , in this study respondents rated the 21items on a scale ranging from 0 (never) to 10 (always). By revising the stem of each item from a cognition perspective (e.g. "how confident are you that you can successfully perform the task") to an action-oriented perspective (e.g. "the frequency with which you engage in the behaviour"), actual behaviours that represented an empowered state were captured.

The EQ was developed from interviews conducted with staff in diverse clinical and non-clinical roles (including nurses) employed at various levels of the healthcare organization. Individuals participating in continuous quality improvement teams, as a structured empowering experience, reported on indicators or behaviours related to empowerment. Empowerment was viewed as cognitions about one's ability to execute a course of action or achieve a certain outcome (Irvine, Keatt, Evans & Baker, 1999). Behaviours reflected three types of empowerment. Outcome empowerment behaviours were defined as confidence in being able to bring about improvements in ones work, affect change or make a difference to organizational effectiveness. Verbal empowerment

described communication behaviours such as debating, discussing or expressing one's point of view to others regarding work problems. Behavioural empowerment items were related to successful performance in learning new skills, preparing reports, taking on new job challenges and overall job performance. All of the behaviours were formulated from a psychological view of empowerment.

A pilot study and subsequent validation study were conducted to establish the validity and reliability of the instrument (Irvine, Keatt, Evans & Baker, 1999). The second study involved managers and non-managers from four hospitals in Ontario, approximately one third were nurses. Irvine et al. reported Cronbach alpha reliabilities ranging between .83-.87 for each subscale. Exploratory factor analysis yielded factor loadings .45-86 validating the 3-factor structure of the instrument. Each empowerment subscale (confidence in ability to perform a behaviour) was strongly correlated to perceptions of actual work behaviours (r=.27-.60) where correlations of .30-.50 reflect a moderate effect and >.50 a large effect size (Kline, 2005). The tool was sensitive to differences in empowerment between management and non-management staff. In a study of managers in Finland, Cronbach alpha reliabilities ranged from .86-.91 (Suominen, Savikko, Puukka, Doran, & Leino-Kilpi, 2005) and .84-.87 in a study of multidisciplinary teams of health care workers (Kuokkanen et al., 2007). The instrument was also used in an unpublished study of staff nurses in Finland although no psychometrics were reported (Makela, 2002). Adequate internal consistency was found for the EQ in this current study (r=.78-.89 for subscales, .88 for the total scale).

In the model tested in this study, psychological empowerment was an antecedent to empowered behaviour. While these variables were theoretically linked, it is necessary to differentiate the measurement of psychological empowerment from empowered

behaviour to justify how these variables are unique. A comparison of some of the selected items used to measure psychological empowerment (Spreitzer, 1996) versus empowered behaviour (Irvine et al.) is found in Table 7. The items for psychological empowerment indicate how the individual feels while empowered behaviours identify specific actions that the individual engages in within the workplace.

Table 7

Comparison of Psychological Empowerment and Empowered Behaviours

Psychological Empowerment	Empowered Behaviours
Competence 1. I am confident about my ability to do my job. 2. I am self-assured about my capabilities to perform my work activities. 3. I have mastered the skills necessary for my job.	**Outcome empowerment** 1. Make a difference to the effectiveness of the hospital that I work in. 2. Help my coworkers make improvements at work. 3. Help my manger make improvements at work. 4. Bring about changes in the way I do my work in this hospital. 5. Bring about improvements in the way work is done in this hospital. 6. State my opinion about work problems to my manager.
Impact 1. My impact on what happens in my unit/program is large. 2. I have a great deal of control over what happens in my unit/program. 3. I have significant influence over what happens in my unit/program.	**Behavioural empowerment** 1. Use analytic skills to collect data about work problems and recommend solutions. 2. Learn new skills related to my current job. 3. Use mathematical/statistical skills on the job. 4. Help people from different departments determine the root cause of problems within the hospital. 5. Work with other hospital employees outside of my own work group to solve work conditions. 6. Handle a more challenging job prepare written reports about work problems.

Job Satisfaction.

Job satisfaction was measured using the Nurse Global Satisfaction Questionnaire, a 5-item Likert scale modified from Hackman and Oldham's (1975) Job Diagnostic

Survey (Laschinger & Havens, 1996). The items include aspects of the job that are related to overall satisfaction with the current job and with co-workers. Responses ranged from 1 (Strongly Disagree) to 5 (Strongly Agree). Adequate reliability for this scale has been established in other studies of hospital-based nurses (Cronbach alpha .77 to .84) (Laschinger, Finegan, Shamian & Wilk, 2004; Laschinger, 2009). The internal consistency of this instrument for the current study was likewise within acceptable limits (r=.85).

Demographics.

Demographic variables were measured to provide a descriptive profile of the nursing sample. Questions included information about the respondent's role (RN or RPN), age, years in current role, years in nursing, highest level of education, and employment status.

Patient Survey.

Patient Satisfaction.

Two standardized questionnaires were used to measure quality-oriented patient outcomes associated with nursing work effectiveness. The Patient Satisfaction with Nursing Care Quality Questionnaire (PSNCQQ) (Laschinger, McGillis Hall, Pederson & Almost, 2005) was selected as a measure of satisfaction specific to nursing care received and could also be used to inform quality improvement initiatives. The instrument included 19 items. Patients assessed each item measuring nursing care quality on a scale from 1 (excellent) to 5 (poor). Each item was prefaced with a phrase to provide focus for the question and was followed by a more detailed question.

The PSNCQQ was adapted from earlier versions of the nursing care quality subscale of the Patient Judgment of Hospital Care Quality that has been tested extensively

across North America using primarily medical-surgical patients (Hays, Nelson, Rubin, Ware and Meterko, 1990; Larrabee, Engle, & Tolley, 1995; Leiter, Harvie & Frizzell, 1998; McNeese-Smith, 1999; Vahey, 2000). This instrument has been tested on a sample of patients discharged from medical-surgical units in hospitals of various sizes across Ontario. The Cronbach alpha reliability was 0.97 across all hospital types (Laschinger, McGillis Hall, Pederson & Almost, 2005) and exploratory and confirmatory factor analyses supported the validity for a one-factor model. Discrimination between high and low levels of overall patient satisfaction with nursing care received was supported in this latter study as well. The contribution of nursing to overall patient satisfaction in this measure was more comprehensive in scope than other instruments currently available. Items refer to the patient's perception of all nurses on the unit with whom they have interacted and is thereby appropriate for the examination of patient outcomes that are dependent on membership to a specific patient care unit.

Therapeutic Self-Care.

The second measure of quality patient care is the Therapeutic Self-care Questionnaire-Acute Care Version (Sidani & Doran, 2004). A second home care version of this questionnaire was also developed for use by patients receiving care in their home. The instrument was designed to be administered by a nurse in an interview format but was completed by the patient or significant other/family member prior to their discharge from hospital. Patients were asked to rate their ability to perform self-care activities when home, e.g. taking their medications as prescribed, recognizing and managing symptoms and changes related to their health problem and carrying out activities of daily living . Reponses to each of the 12 items range from not at all (0) to very much so (5).

This instrument has been shown to be sensitive to the quality of nursing care delivered and has high internal consistency and reliability in the acute care setting (Sidani, 2003; Doran et al., 2006a). The acute care version of the instrument was tested with patients in an acute care setting and Cronbach alpha reliabilities ranged from .89-97 for the total scale (Doran et al., 2006b; Sidani & Irvine, 1999; Sidani et al., 2002;). In the current study, the scale reliability was .90.

Demographics.

Patient outcomes are also influenced by a myriad of factors outside of the quality of nursing care provided. Demographic data were included in the patient survey to determine if there were significant differences in patient satisfaction due to gender, age, and marital status as previous studies have reported difference related to these personal characteristics (Spooner, 2003; Yellen, 2003). The severity of illness can affect ratings of satisfaction regardless of the quality of care received (Laschinger, McGillis Hall, Pederson & Almost, 2005). As a result, patient satisfaction is often risk-adjusted to remove this potential influence on patient satisfaction. Risk adjustment was not used in the current study but an indirect measure was employed to control for the severity of illness. The patient was asked to rate their overall health (very-poor to excellent) prior to hospitalization and to state the number of days that they were in hospital for the most recent admission.

Falls.

The number of patient falls was obtained for each unit from the manager responsible for quality and risk management using existing hospital records. For this study, falls were defined as any unintentional movement to the floor by a patient (White

& McGillis Hall, 2003) and were recorded as the number of falls per 1,000 patient days over the prior 12 month period on the selected units. Falls that arise from syncope (fainting) or external force were excluded. A 12 month period was selected for two reasons. First, to be in the study nurses had to have worked on the unit a minimum of one year. Work environment characteristics and team members were both assumed to be relatively consistent for this period of time. Thus, the patient outcome data and nurses employment overlapped. Second, a 1-year period was selected due to the low monthly incidence of falls.

Control Variables.

In a recent comprehensive review and analysis of the literature on quality nursing workplaces, nurse staffing was identified as a key indicator influencing patient outcomes (McGillis Hall et. al, 2006). Based on this review, recommended measures of nurse staffing for use in research have included nursing care hours per patient day (HPPD), staff mix (the proportion of nursing care hours provided by RNs, RPNs and unregulated care workers), nurse-to-patient ratios (the number of patients assigned to each nurse per shift), the proportion of full-time, part-time and casual staff and the level of education and experience of nursing staff (McGillis Hall, 2005, McGillis Hall et al., 2006). Of this group, HPPD was selected as this measure was found to be the strongest predictor of falls (Yang, 2003) and therefore served as a feasible and valid measure of staffing. The staffing measure (HPPD) is calculated by dividing the number of nursing hours available on the unit (based on the number of nurses and the length of their shift) by the number of patients on the unit (McGillis Hall, 2006). Nurse staffing was included in the study model

as a variable influencing each patient outcome at the group level. Staffing data was requested from the nurse manager as part of the Unit Profile for the study (Appendix E).

Translation of Survey Instruments.

The study instruments, marketing materials and letters of information were made available in both official languages. A private firm that specialized in English-French translation for health care settings was hired to translate the documents from English to French. A bilingual nursing expert translated the French version of the instruments back into English without having seen the original English documents. Three other English-speaking nursing experts then compared the original version and the back-translated versions for comparability in language and similarity of interpretation using a 7-point Likert scale (Wang & Lee, 2006). Items found to be inconsistent in meaning (40/96 items) were then forwarded to another bilingual nursing expert for review and 27 items were revised. The expert selected to conduct this review regularly conducted translation of evidence-based nursing documents from English to French. Nurse Managers determined the need for use of the French and/or English versions of the nurse and patient survey.

In summary, data were collected from nursing and patient subjects as well as from existing hospital records. The use of different data sources was intended to limit any effects of common method variance that can arise with a single source of data.

Data Management

Data Integrity.

Processes for managing the data were performed using data screening steps recommended by Tabachnick and Fiddell (2001). The data from all sources was cleaned

and 15% of all surveys from each patient care unit were audited for accuracy. The error rate was less than 0.1% and no further auditing was deemed necessary. There were no univariate outliers.

Missing Data.

Missing data for the nursing survey was below 5% for all items except one item for the CWEQ2 (visibility of work-related activities, n=60, 9%) (Hazard Munro, 2001). The CWEQ2 consisted of 19 items, therefore this volume of missing data was not considered significant and no cases were excluded from the nursing sample due to missing data from this single item.

On the other hand, there was more missing data on the patient survey particularly for the patient satisfaction instrument. Large amounts of data were missing for two items related to family and friends (8-14% missing data, n=75-139) and for two items related to the discharge process (11-30% missing, n=114-296). Patients were to complete this survey within 24 hours prior to discharge with the expectation that the nurse would have discussed discharge-related issues by that point in the patient's hospitalization. Given the large amount of missing data for these items, it was likely that the discharge instructions had not yet been discussed with patients and a revised instrument capturing their experiences excluding discharge-related activities would be more feasible. Therefore, two items that referred to the discharge process were dropped from the scale leaving 17 items from which to calculate 'inpatient' satisfaction with nursing care. The Cronbach alpha reliability for the 17-item version of the PSNCQQ was within acceptable limits (r=.97).

Missing data were also a problem for the first eight of 12 items of the therapeutic self care instrument (12-14%). An inspection of the data collected in the first four months

suggested that respondents neglected to turn to all pages in the booklet. Subsequent survey packages were assembled differently to prompt the patient to access all pages of the survey booklet. The four problematic items had 3-8% missing data.

The unit profile completed by the nurse managers had large amounts of missing data for the staffing measure (n=15, 20%). The units without staffing data were likewise excluded from the analysis as previously noted.

To manage the missing data, full information maximum likelihood (FIML) estimation methods were used in the structural equation modelling analyses. The advantage of this estimation method is that the bias created by deleting significant numbers of cases with missing data is avoided and at least some of the variability in the data is preserved that would otherwise be lost by using mean imputation (Byrne, 2001). As well, subscale scores were calculated using a mathematical expression that produced a score if at least 50% of the items were present for the subscale (Levesque & SPSS, 2007). If responses where only one or two items of a scale were missing were eliminated from the analysis, power would be reduced and bias increased because of the deletion of many subjects (Patrician, 2002). A large number of nurse (n=133) and patient cases (n=360) from 15 units were also deleted due to missing data for staffing, a control variable.

Variables included in the nursing survey were normally distributed with the exception of the meaning subscale of psychological empowerment (meaningful work) that was somewhat negatively skewed (-1.45) and kurtotic (2.88). Higher scores measuring meaningful work were not unexpected for employees in care-related professions. Within the patient survey, both the inpatient satisfaction and therapeutic self care variables were also slightly skewed (-1.09 and -1.34 respectively) and kurtotic (1.03 and 2.31). While these values do not indicate extreme departures from normality,

maximum likelihood with robust standard errors (MLR) estimation was used within the statistical software package of MPlus. This estimation method is robust to non-normality and non-independence of data (Muthén & Muthén, 2007).

Data Aggregation.

Structural empowerment and group processes were collected at the individual level but were analyzed as group-level constructs. The goal of this strategy was to capture contextual influences of the patient care unit on nurse and patient outcomes i.e. what proportion of the outcome could be attributed to or predicted by the work environment or group processes occurring within various units. In addition, four of the five unit-level outcome variables were also measured at the individual i.e. nurse-assessed quality of care, patient satisfaction, therapeutic self care, and nurse-assessed risk.

Applying Chan's typology of composition models (1998), a direct-consensus approach was used whereby each of these variables measured at the individual-level were conceived to be isomorphic, or functionally similar, to group-level constructs. Therefore, the meaning of the group-level constructs was derived from the consensus among individuals who are members of each group, that being the patient care unit (Chan).

Operationally, individual-level data for the aforementioned variables were aggregated to the group-level for subsequent analysis. Empirical support to justify aggregation and support construct validity was achieved by determining the degree to which individuals within a group agreed (within-group agreement) and the degree to which groups varied on these constructs (between-group variability; Chan, 1998). Klein et al. (2000) recommend that a number of criteria be used since the number and size of groups may influence the results for each index used to test for aggregation.

Within-group agreement was tested using a specific form of rwg, i.e. $r^*_{WG(J)}$ for multiple-item scales where the Spearman Brown correction is removed to prevent overestimation of inter-rater agreement (Lindell, Brandt & Whitney, 1999). The formula used to calculate this index of agreement was:

$$r^*_{WG(J)} = 1 - \frac{\overline{s^2}_{xj}}{s^2_{EU}}$$

where $\overline{s}^2_{xj}$ is the mean of observed variances on J items (J is the number of items in scale) and s^2_{EU} is the expected variance under a uniform distribution. The latter value, s^2_{EU} is equal to $(A^2 -1)/12$ where A is the number of response categories. While many authors recommend a cut-off value of 0.70 for acceptable within-group agreement (Klein et al., 2000), Dunlap, Burke and Smith-Crowe (2003) propose alternate cut-off values that have been tested for significance at the $p<.05$ level for varying sample sizes and numbers of response categories.

Between-group analysis was completed by using three indices: ICC(1), ICC(2) and eta-squared. The first type of intra-class correlation, or ICC(1), represents the proportion of variance in the target variable that is accounted for by group membership (Bleise, 2000). The ICC(1) was calculated using a one-way random effects ANOVA and the Barko (1976) formula as follows:

$$ICC(1) = \frac{MSB - MSW}{MSB + [(k-1)*MSW]}$$

In this formula, MSB is the between group mean square, MSW refers to the within group mean square and *k* is the group size (mean group size used=11.13 for nurses and 16.48 for patients) (Bliese, 2000). Klein et al. (2000) recommend a significant *F*-test for ICC1 to

support the aggregation of data to the group level. Bliese (2000) reported that typical values for ICC(1) are between .05 and .20 and rarely greater than .30.

The ICC(2) was calculated using the following formula :

$$ICC(2) = \frac{MSB - MSW}{MSB}$$

Higher values of ICC(2) indicate reliable between-group differences. A cut-off of .70 is deemed acceptable for aggregation, between .50 and .70 are considered to be marginal and anything lower than .50 is interpreted as poor support for aggregation (Klein et al., 2000).

Eta-squared values were obtained by comparing means where the patient care unit was the independent variable and either structural empowerment or group processes designated as the dependent variable. Eta-squared is interpreted as the amount of variance predicted by group membership i.e. similar to the R^2 in a regression model (Bleise, 2000).

The results of the various aggregation tests for each variable hypothesized to operate at the group level are summarized in Table 8. To assess within-group agreement, the $r^*_{WG(J)}$ values were all above the critical value using cut-off points suggested by Dunlap, Burke and Smith-Crowe (2003) with the exception of group processes that was just under the required value. Only nurse-assessed quality of care was above the minimum value of .70 recommended by Klein et al. (2000). For between-group variance, the ICC(1) values were all within the recommended range with inpatient satisfaction slightly lower (.03) and nurse-assessed quality slightly higher than usual. All values had significant *F* tests. Only nurse-assessed quality of care and adequacy of staffing and resources achieved the minimum value of .70 for ICC(2) with group processes just under

the requirement (.69). The ICC(2) values for structural empowerment and nurse-assessed risk were within the marginal range. The variables generated from patient data (inpatient satisfaction and therapeutic self care) were low indicating more homogenous views with less between group variability. The eta-squared values all supported between-group variability. Overall, all variables met the minimum standard for 75-100% of the criteria for aggregation with the exception of group processes that was just below the critical value on the third of four criteria. In summary, the moderate level of within-group agreement indicated a satisfactory level of consensus among the nurses and patients to justify aggregation.

Table 8

Aggregation test results for group-level variables

Variable	Within-group agreement		Between-group variance		
	$r^*_{WG(J)}$	Critical value*	ICC(1)	ICC(2)	Eta^2
Structural empowerment	.60	.47	.12 *F*=2.57, p=.000	.61	.21
Group processes	.47	.49	.17 *F*=3.22, p=.000	.69	.24
Nurse-assessed quality of care	.72	.48	.23 *F*=4.24, p=.000	.76	.29
Inpatient satisfaction	.64	.38	.03 *F*=1.49, p=.010	.33	.09
Therapeutic self care	.51	.38	.03 *F*=1.46, p=.014	.32	.10
Nurse-assessed risk	.49	.48	.11 *F*=2.39, p=.000	.58	.19

Note. *Critical values for rwg (Dunlap et al., 2003, p. 359); ICC=intraclass correlation.

Justification of Cross-level Analyses.

To test for cross-level effects, it must be first established that the individual-level variable is dependent on the influence of group membership i.e. that the variable is non-independent. ICC(1) is used as a test for non-independence when it is calculated on the dependent variable in the study model (Bleise, 2000). The ICC(1) for psychological empowerment was .051 (F=1.596, p=.004) and .036 (F=1.414, p=.026) for empowered behaviour. Therefore only a small portion of the variance was due to group membership (5% and 3% respectively) although Bleise suggests that any non-zero value for ICC(1) is indicative that group membership is related to the individual-level measure.

Data Analysis

A combination of the Statistics Package for Social Sciences (SPSS; version 16.0) and Mplus (version 5; Muthén & Muthén, 2007) were used for the analyses. Descriptive statistics were used to describe the sample demographics, control variables and the variables within the study model. Appropriate measures of association and tests for differences between means were conducted to examine the relationships between selected demographic variables and major study variables. Cronbach alpha reliability testing was completed for all instruments to determine the internal consistency of the measures.

Multilevel structural equation modeling was used to test the hypothesized study model using Mplus. Simultaneously, the hypothesized direct relationship between structurally empowering work conditions and group processes and, in turn, quality and risk patient outcomes were tested. Similarly at the individual-level, three hypothesized relationships were analyzed: (a) the direct relationship between psychological empowerment and empowered nurse behaviours, perceptions of the quality of patient care and job satisfaction, (b) the direct relationship between empowered behaviours and the

quality of patient care and job satisfaction, and (c) the indirect effect of psychological empowerment on the quality of care and job satisfaction as mediated by empowered behaviour. At the same time, two cross-level or contextual effects were evaluated. The direct relationship between unit-level structurally empowering work conditions and individual psychological empowerment was tested to determine how much of the variation in psychological empowerment was explained by the differences in structural empowerment between units. Finally, the extent to which work group processes moderated the relationship between psychological empowerment and empowered behaviours was tested i.e. how the relationship changes due to differences in work group processes between patient care units. Control variables that reflected the characteristics of the patient care unit were also tested for their influence on the dependent variables in the study model.

Multilevel SEM (MLSEM) is used to analyze data that is measured at both the individual level as well as data that is nested or clustered reflecting concepts and processes that operate at a group level. MLSEM is the only statistical technique that allows you to specify and test relationships at group, individual and cross levels of analysis. By simultaneously testing all levels of relationships, the multilevel analysis can determine the portion of the outcome's variance that is due to group characteristics (between unit variance) and that due to individual factors (within unit agreement) (Heck, 2001).

Structural equation modeling (SEM) is an advanced regression technique that tests the entire set of variables in a theorized model to determine if the model is consistent with the data obtained from the sample (Byrne, 2001). Various indices are used to determine if the model adequately fits with the data thereby supporting the plausibility of the

proposed relationships (Byrne). SEM offers a flexible and comprehensive approach that accounts for random measurement error thereby providing a more reliable estimate of path coefficients (Hoyle, 1994). Mplus uses maximum likelihood estimation (ML) which is an iterative process to determine parameter coefficients, standard errors and chi-square tests of model fit that acknowledge the non-independence of data (Heck, 2001; Muthén & Muthén, 2007). This is accomplished by calculating coefficients using a covariance matrix. The researcher is better able to prevent improper inferences about associations between variables that are caused by misleading variables that suppress real relationships or act as spurious causes for a relationship that does not exist (Hoyle & Smith, 2004). Each of the relationships in the hypothesized model are derived from theory thereby meeting the theoretical conditions for causality i.e. formulation of a priori hypothesized relationships prior to model testing (Maxim, 1999). Even though data were generated from a cross-sectional design, SEM is a causal modeling technique because the hypothesized model is directed by theory. While SEM does not establish cause, the results are used to support the likelihood of the directional relationships noted in the theoretical model.

Ethics

The study proposal was initially approved by the Health Services Research Ethics Board at the University of Western Ontario and re-approved due to the length of the data collection period (Appendix A). There were no known risks, harms or discomforts that were experienced by nurses or patients who agreed to be part of the study. To ensure participants' confidentiality, no names appeared with any data. Any means of identifying the participants were secured, accessible only to the researcher, and were destroyed after

the data collection was complete. Only grouped data was presented and any information that could personally identify any individual was excluded.

Summary

A convenience sample of nurses and patients from medical and/or surgical inpatient units across Ontario was employed for the multi-level multi-site study of work environments and their impact on nurse and patient outcomes. Data were collected using self-report surveys comprised of standardized instruments with established psychometric properties. Managers provided details regarding unit characteristics and the rate of falls as reported in the hospital's existing database. The final sample of 61 patient care units included 679 nurses (34% response rate) and 1005 patients (49% response rate). The impact of missing data was managed through subscale calculations based on a minimum of 50% completed items and through MLR estimation during model testing. The aggregation of data for variables analyzed at the group level was supported through tests of within-group agreement and between-group variation. Mplus software was used run multi-level structural equation modeling to test the hypothesized study model. Results of the analysis are reported in Chapter 4.

Chapter 4

Results

The study was designed to extend our knowledge of structural empowerment theory and our understanding of nursing work environments as outlined in the following objectives:

1. to determine the impact of empowering work conditions on individuals and on group processes,
2. to determine the impact of empowering work conditions on objective measures of patient outcomes,
3. to examine if perceptions of empowering workplaces are reflected in empowered behaviours, and
4. to test the relationships between work environments and nursing and patient outcomes using a multilevel model that acknowledges the contextual effects of groups on individual nurse attitudes, behaviours and work effectiveness.

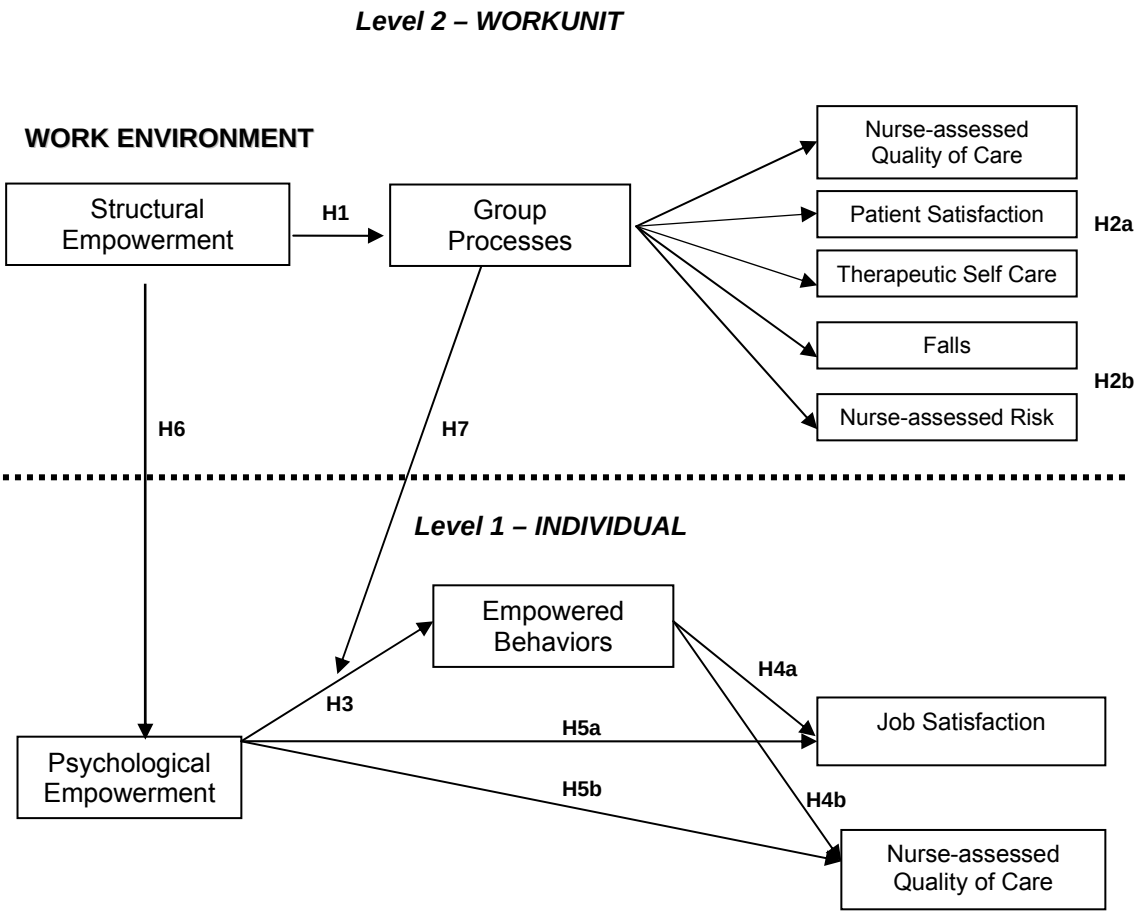
These objectives were incorporated into the hypothesized study model (Figure 1, p. 82) and tested using a sample of nurses and patients from medical and surgical units across Ontario. The results of the multilevel model analysis are the focus for this chapter.

To begin, descriptive findings are reported for study variables contained within each of the four data sources: nurse survey, patient survey, unit profile (including control variables) and falls. Preliminary analysis of the relationships between study variables at the group and individual levels is provided based on a correlation matrix of the key model variables. Next, the statistical analysis of the full hypothesized model using multilevel structural equation modeling (MLSEM) is presented. The MLSEM analysis simultaneously tested three sets of hypotheses: a group-level mediation model specifying

group processes as a mediator of the effect of unit structural empowerment on patient outcomes, an individual-level mediation model specifying behavioural empowerment as a mediator of the effect of psychological responses to workplace empowerment on nursing outcomes and lastly, cross-level hypotheses that tested the effect of unit level empowerment on individual nurses' psychological empowerment and the moderating effect of group processes on the relationship between psychological empowerment and empowered behaviours. The influence of control variables on the model outcomes are described at the group and individual levels. The chapter concludes with a synthesis of the overall findings for this study according to the study objectives noted above.

Figure1

Hypothesized Study Model of Work Environment and Patient/Nurse Outcomes



Descriptive Statistics

Nurse Survey.

In the next section, the descriptive findings are presented for variables aggregated to the group-level (refer to Table 9 and 10) including the following: work environment factors (structural empowerment), teamwork (group processes), nurse-assessed quality of care and adverse events (risk). Variables analyzed at the individual level are then presented and include psychological empowerment, empowered behaviours, job satisfaction and nurse-assessed quality of patient care (refer to Table 11).

Group-level variables.

Overall access to work environment factors that empower nurses to work effectively was near the mid point of the score range ($\overline{X}$ =17.58, SD=1.56, range 6-30) indicating moderately empowering conditions. Opportunity for development and challenging work ($\overline{X}$ =3.91, SD=.37) as well as informal power ($\overline{X}$ =3.42, SD=.28) contributed the most to overall structural empowerment (scale range 1-5). Formal power ($\overline{X}$ =2.24, SD=.34) and access to resources (2.58, SD=.39) were the lowest of the six empowering workplace factors. The two global empowerment items were of similar magnitude providing construct validity for the CWEQII ($\overline{X}$ = 2.81, SD=.54, range 1-5).

Table 9

Nurse Survey – Group Level Variables

Variable	Score Range	$\overline{X}$	SD
Structural empowerment (total empowerment)	6-30	17.58	1.56
Opportunity	1-5	3.91	.37
Information	1-5	2.71	.41
Support	1-5	2.72	.32
Resources	1-5	2.58	.39
Informal power	1-5	3.42	.28
Formal power	1-5	2.24	.34
Global empowerment	1-5	2.81	.54
Group processes	1-7	4.75	.53
Interdependence	1-7	4.71	.46
Potency	1-7	4.75	.69
Support	1-7	5.08	.66
Share workload	1-7	4.12	.73
Communicate/cooperate	1-7	5.10	.54
Adverse events	1-4	2.39	.30
Nurse assessed quality of care	-	-	-
General quality of nursing care	1-4	3.26	.34
Quality last shift	1-4	3.30	.29
Manage care on discharge	1-4	1.84	.32
Positive change in quality over past year	1-3	2.61	.34

Note. $\overline{X}$ = mean, SD = standard deviation.

Group processes, as key components of teamwork, received an overall mean of 4.75 (SD=.53) using a scale ranging from 1 (strongly disagree) to 7 (strongly agree). Nurses viewed their work as being interdependent ($\overline{X}$ = 4.71, SD=.46). Given that the nurses had worked in their current role an average of 12 years (SD=10.04), group membership was stable even though some members of the team may change on a given shift or week. The strongest processes within the teams were communication and cooperation ($\overline{X}$ = 5.10, SD=.54) and supporting one another ($\overline{X}$ = 5.08, SD=.66) while sharing workload was the weakest of the five group processes ($\overline{X}$ = 4.12, SD=.73).

The nurses' perspective of patient outcomes was captured in terms of quality and risk assessments. Both the mean values (Table 9) and the frequencies for each response category (Table 10) are provided to assist with comparisons found in the literature. Nurses' viewed the overall quality of nursing care and the quality of care last shift to be good ($\overline{X}$ = 3.26, SD=.34 and 3.30, SD=.29 respectively, range 1-4) and relatively unchanged over the past year ($\overline{X}$ =1.84, SD=.32, range 1-3). Alternatively, the nurses were confident patients could manage their care when discharged home ($\overline{X}$ =2.61, SD=.34, range 1-4). The mean score was 2.39 (SD=.30, scale range 1-4) for the frequency of adverse (risk-oriented) patient outcomes. Over the past year, nurses reported that nosocomial infections (52.8%) and patient falls with injuries (49.2%) occurred occasionally to frequently.

Table 10

Nurse Survey – Group Level Variables-Frequencies for Selected Variables

Variables	Never N (%)	Rarely N (%)	Occasionally N (%)	Frequently N (%)
Adverse events				
Wrong medication/dose	155 (22.8)	312 (45.9)	190 (28.0)	15 (2.2)
Nosocomial infection	76 (11.6)	231 (35.2)	256 (39)	94 (13.8)
Patient falls with injury	96 (14.1)	246 (36)	256 (37.9)	77 (11.3)
Patient/family complaints	97 (14.3)	272 (40.2)	252 (37.2)	56 (8.3)
Nurse assessed quality of care	Poor	Fair	Good	Excellent
General quality of nursing care	3 (0.4)	51 (7.6)	356 (52.7)	265 (39.3)
Quality last shift	2 (0.3)	50 (7.4)	347 (51.4)	276 (40.9)
Positive change in quality over past year	Deteriorated	Remained the same	Improved	-
	181 (26.8)	413 (61.1)	82 (12.1)	
Manage care on discharge	Not at all confident	Somewhat confident	Confident	Very Confident
	24 (3.6)	256 (37.9)	332 (49.1)	64 (9.5)

Note. N = number,

Individual-level Variables.

Results for the individual-level variables are found in Table 11. Psychological empowerment includes the cognitive awareness of and psychological reaction to empowering conditions in the workplace. In this study, nurses were moderately to highly empowered with a mean of 3.82 on a scale of 1-5 (SD=.50). Nurses felt that their work was very meaningful ($\overline{X}$ = 4.48, SD=.66) but that this work was viewed as having only modest impact on organizational outcomes ($\overline{X}$ = 2.52, SD=.91).

Table 11

Nurse Survey – Individual Level

Variable	Score Range	$\overline{X}$	SD
Psychological empowerment	1-5	3.82	.50
Meaning	1-5	4.48	.66
Competence	1-5	4.36	.57
Autonomy	1-5	3.93	.71
Impact	1-5	2.52	.91
Empowered behaviour	0-10	5.28	1.73
Behavioural empowerment	0-10	4.87	1.76
Verbal empowerment	0-10	5.89	1.86
Outcome empowerment	0-10	5.09	2.09
Job satisfaction	1-5	2.85	.94
Nurse-assessed overall quality of care	1-4	3.31	.63

Note. $\overline{X}$ = mean, SD = standard deviation.

Nurses were asked to judge the frequency with which they engaged in three types of empowering behaviours where a score of 0 indicated never and 10 meant that they always demonstrated these behaviours. Ratings on all three aspects of empowered behaviour averaged just above the midpoint of the scale with the overall mean of 5.28 (SD=1.73). Verbal empowerment was the most frequently reported behaviour ($\overline{X}$ = 5.89, SD=1.86) e.g. discussing one's perspective on work-related problems. Outcome empowerment, or making changes or improvements, was a mean of 5.09 (SD=2.09) while

behavioral empowerment, e.g. performing well in using skills to solve problems, was the lowest of the three dimensions ($\overline{X}$ = 4.87, SD=1.76).

Nurses were moderately satisfied with their jobs ($\overline{X}$ =2.85, SD=.94, range 1-5) although only 40% of nurses agreed or strongly agreed with statements regarding their job satisfaction. The nurses rated the overall quality of nursing care delivered on their unit to be good (53%) or excellent (39%) with a mean of 3.31 (SD=.63, range 1-4).

Patient Survey

Patient data used to test the study model were aggregated to the group level to reflect unit level outcomes arising from working conditions within a given medical or surgical unit. Patient satisfaction, renamed as 'inpatient satisfaction', was determined from 17 of the 19 items to better reflect the patient's experience prior to discharge from hospital. This decision was based on the large amount of missing data for items 18 (11.3 %, n=114) and 19 (29.5%, n=296) that referred to the discharge process. Although patients were to complete the survey within 24 hours prior to discharge, it is possible that the patients either didn't receive this information before completing the survey or that this component of the discharge process was done just in time immediately before the patient left the unit. Overall patient satisfaction was high ($\overline{X}$ =4.26, range 1-5) with only limited variability from the mean (SD=.27). Concern and caring by the nurses was the most highly ranked aspect of patient satisfaction ($\overline{X}$ = 4.58, SD=.30). Recognition of the patient's opinions and choices were rated the lowest of all items ($\overline{X}$ =3.90, SD=.40). Three items were used to validate the overall construct of patient satisfaction. Inpatient satisfaction was highly correlated with the overall quality of nursing care (r=.86, p<.01), overall quality of care and services (r=.82, p<.01) and recommending the hospital based

on the quality of nursing care (r=.69, p<.01) thereby supporting the construct validity of the inpatient satisfaction measure. Item means and SDs are provided in more detail in Table 12.

Table 12

Patient Survey –Inpatient Satisfaction with Nursing Care Quality – Group Level

Variable	$\overline{X}$	SD	Score Range
Inpatient satisfaction with nursing care	4.26	.27	1-5
1. explains what to expect	4.24	.36	
2. explains preparation for tests/operations	4.21	.36	
3. ease of getting information	4.40	.31	
4. how well nurses communicated with family	4.29	.34	
5. informing family and friends	4.06	.34	
6. involving family and friends	4.10	.33	
7. concern and caring by nurses	4.58	.30	
8. how often nurses checked on you	4.36	.36	
9. nurses give you choices	3.90	.40	
10. willingness of nurses to be flexible	4.26	.31	
11. adjusted schedules to patients needs	4.17	.35	
12. make you comfortable and reassure you	4.43	.33	
13. nurses response to calls	4.14	.44	
14. skills and competence	4.43	.32	
15. coordination of care	4.26	.30	
16. restful atmosphere	4.06	.40	
17. provided privacy	4.40	.32	
Patient satisfaction with nursing care – validation items	4.50	.26	1-5
20. overall quality of care and services	4.43	.30	
21. overall quality of nursing care	4.48	.28	
22. recommend hospital	4.58	.30	

Note. $\overline{X}$ = mean, SD = standard deviation.

Therapeutic self-care refers to the patient's views on their ability to manage their care after discharge to home which is also considered to be reflective of quality care and nursing work effectiveness. The mean value for this sample was 4.04 (SD=.38) on a scale of 1-5. The patients felt there were most able to manage their prescribed medications

($\overline{X}$ =4.54, SD=.37) and were least able to perform regular activities ($\overline{X}$ =3.28, SD=.65). Further information on scale items are noted in Table 13.

Table 13

Patient Survey –Therapeutic Self Care - Group Level

Variable	$\overline{X}$	SD	Score Range
Therapeutic Self Care	4.04	.38	1-5
1. knowledge of what medication to take	4.27	.49	
2. understand purpose of medications	4.25	.55	
3. able to take medications as prescribed	4.54	.37	
4. recognize body symptoms related to condition	4.11	.51	
5. understand symptoms related to condition	3.99	.47	
6. understand how to control changes	3.85	.58	
7. able to carry out treatments that have been taught	3.93	.56	
8. able to look after health in general	3.94	.51	
9. know whom to contact for help regarding daily activities	4.10	.40	
10. know whom to contact regarding medical emergencies	4.46	.38	
11. able to perform regular activities	3.28	.65	
12. able to adjust regular activities when symptoms related to health condition	3.66	.51	

Note. $\overline{X}$ = mean, SD = standard deviation.

Unit Profile

Unit-specific data were collected to describe other contextual variables that could impact either nurse or patient outcomes. The average size of the unit was 33 beds (SD=11.05) with 120 discharges per month (SD=66.98). The managers for the units held the role for an average of 4.7 years but there was a large degree of variability among this group (SD=5.32) with a range of one month to 22 years. The managers' span of control was reflected in the number of employees reporting to them which varied between 27 and 130 ($\overline{X}$ =72, SD=24.70). Sixty-six percent of the units operated on the basis of 8-hour shifts (n=37 units) with the remaining units using 12-hour shifts (30%, n=21).

Staffing was measured using the number of nursing care hours per patient day (HPPD) as well as the nurse-to-patient ratio assigned across shifts. The mean staffing level was 5.96 (SD=1.40, range 2.77-10.2) which was lower than in other reported studies. Staffing was 7.8 (SD 1.9) in a study of 799 hospitals across the U.S. using 1997 administrative databases (Needleman, Buerhaus, Mattke, Stewart, & Zelevinsky, 2002). Staffing levels of 8.23 for medical units and 7.73 for surgical units was reported in a systematic review of staffing and patient outcomes that included 94 studies published from 1990 and 2006 (Kane, Shamilyan, Mueller, Duval & Wilt, 2007). The nurse-to-patient ratio for RNs and RPNs was an average of 5.53 (SD=.77, range 4.00-7.50) patients assigned to a given nurse over a 24-hour period. This is lower than in a prior study of nurses in Ontario (7.1, SD 2.2) (Aiken, Clarke & Sloane, 2002). In a recent study examining the differences between states with or without mandated nurse-to-patient ratios, the nurse-to-patient was 4.8 for California (mandated staffing ratios) versus 6.5 and 6.8 for two states without mandated staffing ratios (Aiken et al., 2010). In each of these comparative studies, the nurse-to-patient ratio was calculated for RNs only and did not reflect the staff mix of RNs and RPNs as used in this current study.

The most predominant staffing mix was a combination of RNs and RPNs (43%, n=24 units) followed by an all-RN model (27% of the units, n=15). For the remaining units, unregulated workers such as Personal Support Workers (PSWs) were included in the mix with RNs (18%, n=10) or combined with both RNs and RPNs (16%, n=11). For the RN-RPN staff mix, the overall proportion of RNs was 83% and for staffing models that included all three categories (RN, RPN and PSW) the proportion RN as 79%. Refer to Table 14 for further details.

Table 14

Demographic Characteristics – Unit Profile

Variable	**M**	**SD**	**N** (61 units)	**%**
Unit size (no. beds)	33.00	11.05		
No. patient discharges/month	120.00	66.98		
Manager Characteristics				
Years in current role	4.66	5.32		
Number of direct reports (range 27-130)	71.91	24.70		
Shift type				
8 hour			37	66.1
12 hour			19	33.9
Staff mix				
RN			15	26.8
RN/RPN			24	42.9
RN, RPN, Unregulated worker			10	17.9
RN/unregulated worker			7	12.5
Staffing Characteristics				
Nurse patient ratio	5.53	.77		
Nursing hours per patient day (HHPD)	5.96	1.40		
Staff mix proportions (FTE)				
RN			15	26.8
RN/RPN			24	42.9
RN/RPN/Unregulated			10	17.9
RN/Unregulated			7	12.5
Proportion RN (RN/RPN mix)	83%	18%		
Proportion RN (RN/RPN/Unregulated mix)	79%	17%		
Patient Falls (rate per 1,000 patient days)	4.91	3.06		
Falls Best Practice Guidelines in place			32	58.2

Note. $\overline{X}$ = mean, SD = standard deviation, N = number, FTE = full time equivalents,.

Falls

The mean number of patient falls per 1,000 patient days over the previous year was 4.91 (SD=3.06) ranging from 0.11 to 11.6 across units. Best practice guidelines for falls were in place for 58 % of the medical and surgical units (n=32).

Preliminary Analyses

The relationships between variables were initially assessed using bivariate correlational analyses. The associations between group-level variables are found in Table 15. The significant relationships between structural empowerment, group processes and nurse-assessed quality and risk were as hypothesized. Although non-significant, the correlation between structural empowerment and falls was non-trivial (r= -.25) as was the correlation between group processes and falls (r= -.15). Nurse-assessed patient risk was negatively correlated with structural empowerment (r= -.31, p<.05) and group processes (r= -.20, n.s.). Conversely, the anticipated relationship between structural empowerment, group processes and outcomes generated from the patient survey were not supported (inpatient satisfaction, therapeutic self care). There was a significant correlation between nurse-assessed quality of care and inpatient satisfaction (r = 0.25, p<.05) suggesting only a small amount of agreement between how nurses and patients evaluate the quality of care. As expected, other control variables thought to contribute to the patient outcomes, i.e. length of stay (LOS) as a proxy for the illness severity and staffing levels, were significantly related to several patient outcomes. As the patient's length of stay increased, their satisfaction with nursing care decreased (r = -0.45, p<0.01). Higher staffing levels were associated with both lower rates of patient falls on the unit (r = - 0.43, p<.01) and fewer nurse-assessed risks (r = -.37, p < .01) e.g. medication errors, falls with injuries and nosocomial infections.

Table 15

Correlation Matrix – Group and Individual Levels

Level 2 Variables (Group)	Patient Care Unit (n=61)								
	1	2	3	4	5	6	7	8	9
1. Structural empowerment	-----								
2. Group processes	.64***	-----							
3. Nurse-assessed quality of care	.51**	.64**	-----						
4. Inpatient satisfaction	.02	-.05	.25*	-----					
5. Therapeutic self care	.01	.12	.04	.13	-----				
6. Patient falls	-.25	-.15	-.26*	-.07	.05	-----			
7. Nurse-assessed patient risk	-.31*	-.20	-.44**	-.33*	-.04	.44**	-----		
8. Length of stay	-.11	.11	.20	-.45**	.03	.30*	.25	---	
9. Staffing (HPPD)	.21	.14	-.18	-.08	.04	-.37**	-.43**	.11	---

Level 1 Variables (Individual)	Nurses (n=697)				
	1	2	3	4	5
1. Psychological empowerment	-----				
2. Empowered behaviour	.45**	-----			
3. Job satisfaction	.48**	.36**	-----		
4. Nurse-assessed quality of care	.25**	.20**	.37**	-----	
5. Years nursing	.17**	.12**	.20**	.04	-----

Note. *p<.05, **p<.01, ***p<.001; HPPD = nursing care hours per patient day.

Correlation results for individual-level variables are also presented in Table 15. Psychological empowerment and empowered behaviour were positively related to all of the other individual level variables as hypothesized. The correlations indicate that the

longer nurses were in the profession, the more they felt empowered ($r = 0.17$, $p < .01$), acted empowered ($r = 0.12$, $p < .01$) and experienced job satisfaction ($r = 0.20$, $p < .01$).

Multilevel Model Results

The results from multilevel SEM (MLSEM) analysis of the hypothesized study model are summarized in Figure 3. According to guidelines recommended by Kline (2005), model fit was determined using the following indices and the related thresholds for acceptable fit: a non-significant Chi-Square (no significant difference between hypothesized model and the data), Comparative Fit Index (CFI, >.90), Tucker Lewis Index (TLI, >.90), Root Mean Square Error of Approximation (RMSEA, ≤.05), Standardized Root Mean Square Residual (SRMR, <.10). The hypothesized model fit well with the data derived from the nurses and patients in the sample ($\chi 2=21.074$, df=10, CFI=.985, TLI=.921, RMSEA=.041, SRMR .002[within] and .054[between], p=.02).

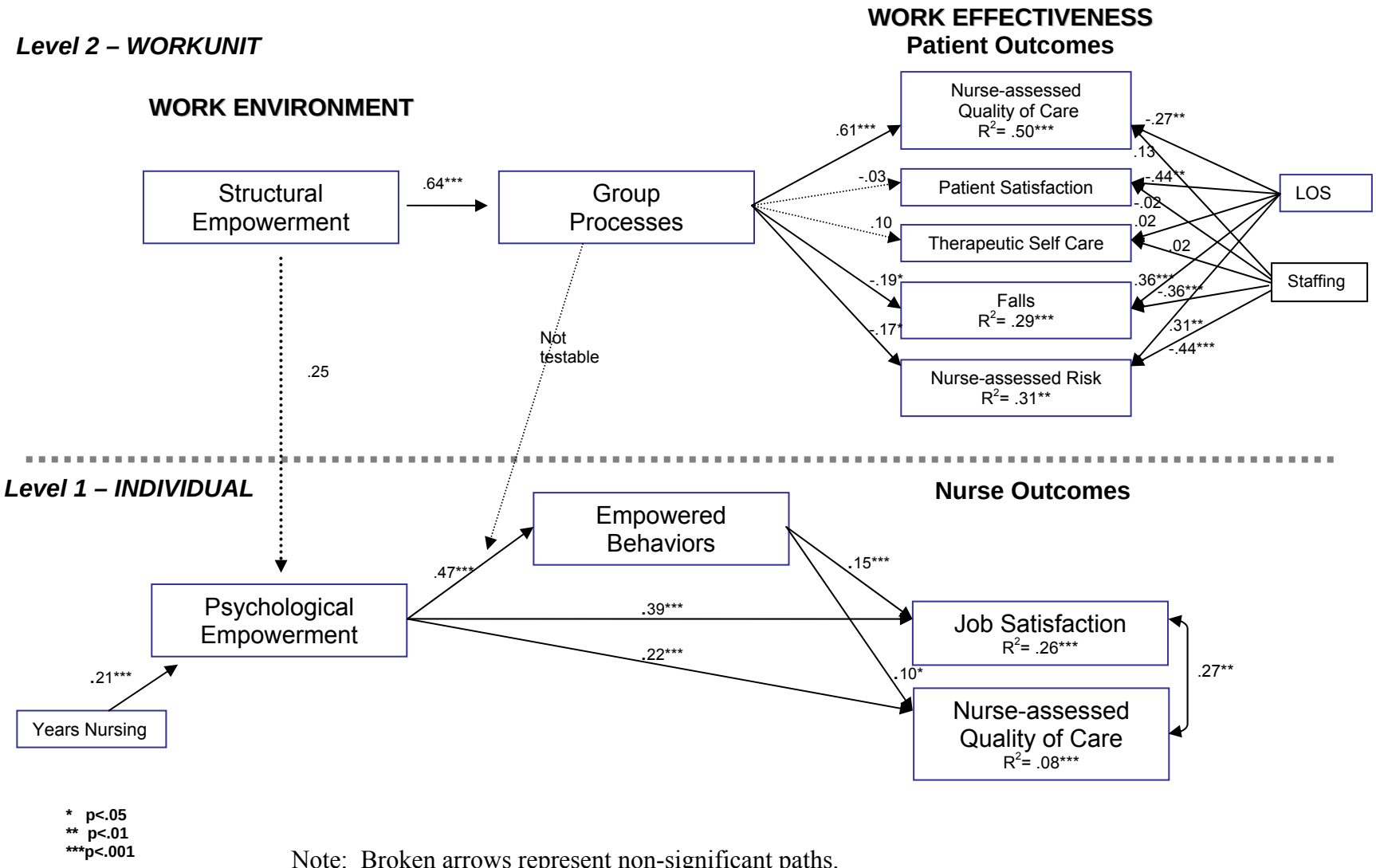
The predicted relationship between structural empowerment and group processes was strong and significant ($\beta=.64$, $p<.001$). Group processes were positively associated with nurse-assessed quality ($\beta=.61$, $p<.001$) and negatively related to falls ($\beta= -.19$, $p<.05$) and nurse-assessed risk ($\beta= -.17$, $p<.05$). There were no significant relationships to patient satisfaction and therapeutic self care using data obtained from directly from patients. The impact of nurse staffing and patient severity of illness (related to their LOS) was controlled for in the analysis of the patient outcomes. For additional details regarding statistical results for all hypothesized relationships in the study model, refer to the table of path coefficients, standardized errors, t values and probability results provided in Appendix J.

There was strong support for Hypothesis 1 where team-level structural empowerment had a positive effect on group processes ($\beta=.64$, $p<.001$). For Hypothesis

2a, group processes were predicted to positively mediate the relationship between team-level structural empowerment and quality-oriented patient outcomes: patient satisfaction, therapeutic self care, and nurse-assessed quality of patient care. There were no direct effects of structural empowerment on any of the patient outcomes. There was a significant indirect effect on nurse-assessed quality of patient care (β=.39, $p<.001$). Therefore, there

Figure 3

Multilevel Model of Work Environment and Patient/Nurse Outcomes



Note: Broken arrows represent non-significant paths.

was support for the fully mediated effect of structural empowerment on nurse-assessed quality through group processes. Hypothesis 2b was also supported where group processes negatively mediated the relationship between structural empowerment and risk-oriented patient outcomes: patient falls and nurse-assessed patient risk. The indirect effect of structural empowerment on patient falls and nurse-assessed risk was similar in magnitude (β= -.12 and -.11 respectively, $p<.05$).

At the individual level of analysis, all of the hypothesized relationships were supported by the data. Psychological empowerment has a significant positive effect on empowered behaviours (β=.47, $p<.001$) as well as the nurse outcomes of job satisfaction (β=.39, $p<.001$) and nurse-assessed quality of care (β=.22, $p<.001$). Empowered behaviours likewise had a significant positive impact on job satisfaction (β=.15, $p<.001$) and nurse-assessed quality of care (β=.10, $p<.05$).

Controlling for years of nursing experience, perceptions of psychological empowerment were positively and significantly related to empowered behaviour as per Hypothesis 3 (β=.47, $p<.001$). The results also supported Hypothesis 4 where empowered behaviours had a mediating effect between psychological empowerment and nurses' job satisfaction (H4a) and perceived quality of patient care (H4b) although only partial mediation was found. The direct effects of psychological empowerment on both outcome variables were stronger than the indirect paths through empowered behaviours as noted in Table 16. These results support Hypothesis 5 in that perceptions of psychological empowerment had a positive and significant relationship to nurses' job satisfaction (H5a; β=.39, $p<.001$) and the quality of patient care delivered (H5b; β=.22, $p<.001$). Based on the modification indices, an additional positive relationship between job satisfaction and

nurse-assessed quality was recommended (β=.27, p<.001). This path was added to the study model as it could be supported theoretically.

Table 16

Mediation Results for Individual-Level Hypotheses (n=697)

Variables	Direct Effect			Indirect Effect			Total Effect		
	b	SE b	β	b	SE b	β	b	SE b	β
Psychological empowerment → empowered behaviour → job satisfaction	.75	.07	.39***	.14	.03	.07***	.89	.06	.47***
Psychological empowerment → empowered behaviour → nurse-assessed quality of care	.28	.05	.22***	.06	.03	.05*	.34	.05	.27***

Note. *p<.05, **p<.01, ***p<.001; b = unstandardized beta; SE = standard error, β = standardized beta.

The hypothesized cross-level effects were not significant. Structural empowerment at the group level accounted for some of the variance in individual-level psychological empowerment but was not statistically significant (β=.25, p=.299). The predicted moderating effect of group processes (Level 2) on the relationship between psychological empowerment and empowered behaviour (Level 1) was not testable statistically and was removed from the final model.

Hypothesis 6 was not supported as team-level structural empowerment was not significantly related to individual-level psychological empowerment. While not statistically significant, a standardized beta of 0.25 is a non-trivial effect size (t=1.04, p=.30). It is possible that significance may not have been achieved due to the lack of power associated with the sample size of groups (n=61). As noted earlier, there was insufficient variance in the slopes to test the hypothesis that team-level group processes positively moderate the relationship between individual-level psychological empowerment and empowered behaviour. Hypothesis 7 was therefore not supported.

The effect size estimates for each dependent variable are summarized in Table 17. At Level 2, the set of predictors for all of the patient outcome variables (structural empowerment, group processes, nurse staffing and patient LOS) accounted for 50% of the variance in nurse-assessed quality of care with group processes as the stronger predictor (β=.61, p<.001). Similarly, while controlling for the effect of length of stay (β=.36, p<.001) and nursing care hours (β= -.36, p<.001), 29% of falls were due to group processes (β= -.19, p<.05) and structural empowerment (-.12, P<.05). Using the same control variables, nurse-assessed risk was also explained by the predictor variables (R^2=.31, p<.01). The predictors in the model accounted for only a non-significant amount of the variability in patient satisfaction (R^2=.20, p=.155) and a negligible amount of therapeutic self care (R^2=.01, p=.634)

Table 17

Predictors of Patient and Nurse Outcomes

Dependent Variable	Independent Variables	b	SE b	β	R^2
Nurse-assessed quality of patient care (group-level)					.50***
	Structural empowerment	.09	.02	.39***	
	Group processes	.39	.05	.61***	
	Length of stay (LOS)	-.02	.01	-.27**	
	Staffing (HPPD)	.03	.02	.13	
Patient satisfaction					.20
	Structural empowerment	-.00	.01	-.02	
	Group processes	-.02	.06	-.03	
	Length of stay (LOS)	-.03	.01	-.44**	
	Staffing (HPPD)	-.00	.02	-.02	
Therapeutic self care					.01
	Structural empowerment	.02	.02	.07	
	Group processes	.07	.08	.10	
	Length of stay (LOS)	.00	.01	.02	
	Staffing (HPPD)	.01	.02	.02	
Falls					.29***
	Structural empowerment	-.24	.13	-.12*	
	Group processes	-1.11	.59	-.19*	
	Length of stay (LOS)	.23	.06	.36***	
	Staffing (HPPD)	-.80	.21	-.36***	
Nurse-assessed risk					.31**
	Structural empowerment	.02	.01	-.11*	
	Group processes	-.09	.05	-.17*	
	Length of stay (LOS)	.02	.01	.31**	
	Staffing (HPPD)	-.09	.02	-.44***	
Job satisfaction					.26***
	Empowered behaviours	.08	.02	.15***	
	Psychological empowerment	.75	.07	.39***	
	Years nursing	.01	.00	.09*	
Nurse-assessed quality of patient care (individual-level)					.08***
	Empowered behaviours	.04	.02	.10*	
	Psychological empowerment	.28	.05	.22***	
	Years nursing	-.00	.00	-.02	

Note. *p<.05, **p<.01, ***p<.001; HPPD = nursing care hours per patient day; b = unstandardized beta; SE = standard error, β = standardized beta.

At Level 1, 26% of nurse job satisfaction and 8% of nurse-assessed quality of care was explained by the predictors (psychological empowerment, empowered behaviours and years nursing experience). Of this group, psychological empowerment contributed the

strongest effect on job satisfaction (β=.39, p<.001) and nurse-assessed quality of care (β=.22, p<.001).

Differences Related to Unit and Demographic Characteristics.

Differences in patient outcomes attributed to unit characteristics were evaluated using ANOVA. No differences were found due to staff mix or type of shifts (eight versus twelve hours). For variables at the ratio-level of measurement, correlational analyses were used to determine the association with patient outcomes. Units with a greater number of beds were associated with more nurse-assessed risks (r=.35, p<.01) and lower nurse-assessed quality of patient care (r= -.31, p<.05). The rate of falls was inversely proportional to the percentage of full-time nurses (r= -.27, p<.05) as well as the overall percentage of RNs in a staff mix of RN/RPNs (r= -.60, p<.01) or RN/RPN/PSWs (r= -.57, p<.01).

At the individual level, there were no significant effects of gender, nursing license, full or part time employment status or educational level for the nurses' job satisfaction and their quality of patient care ratings. However, nurses who were older and had more nursing experience reported higher levels of job satisfaction (r=.22 and .20 respectively, p<.01). Since age and years of nursing experience are interchangeable, only years experience was included in the MLSEM analysis.

Summary of Overall Findings

A multilevel model hypothesizing the effect of empowered work environments on patient and nurse outcomes was tested using MLSEM. Model fit indices and path coefficients provided support for the majority of theorized relationships among variables in the model. Structural empowerment, mediated through group processes, significantly

impacted a variety of patient outcomes including nurse-assessed quality and risk as well as a more objective measure of patient falls although no significant effect was found for variables assessed using patient data sources. The presence of structurally empowering workplace factors was found to have a significant influence on how nurses functioned together as a group but these factors accounted for a small non-significant but non-trivial amount of variance in psychological empowerment. Nurses who felt more psychologically empowered were more likely to engage in empowered behaviours. Psychological empowerment was only partially mediated by empowered behaviours and had stronger direct effects on nurses' job satisfaction and ratings of patient care quality. There was no contextual effect of group processes on the relationship between psychological empowerment and empowered behaviours as originally predicted. Therefore, the data supports the relationship between the quality of the workplace and nurse work effectiveness as manifested in positive patient outcomes. The evidence also supports the positive impact of psychologically empowering work environments on empowering behaviours and job attitudes. A more detailed discussion of the final model and study results is provided in Chapter 5.

Chapter 5

Discussion

This study was concerned with the quality of the nurses' work environment and its impact on nursing and patient outcomes. The intention was to generate evidence to support the investment in work environments as a means to recruit and retain an adequate supply of nurses. Given that decision makers within organizations are accountable for financial and patient care quality performance indicators, the argument was made that investments to enhance the quality of the work environment for nurses could be the means by which to achieve the end of improved patient care quality. The purpose of this study was to determine the relationship between nurses' perceptions of their work environment and the quality and risk outcomes for patients and nurses in acute care settings. A multi-level multi-site cross-sectional design was used to test hypothesized relationships between a) empowered work environments, group processes and patient outcomes at the group level, b) psychological empowerment, empowered behaviour and nurse outcomes at the individual level and c) cross-level effects of group-level structural empowerment on individual-level psychological empowerment. Data were collected from hospital databases as well as self-report surveys from nurses and patients in 61 medical and/or surgical units within 21 hospitals across Ontario.

This chapter includes a discussion of the findings of this research beginning with the hypothesized model that was tested using multi-level structural equation modeling. Next, a discussion of the impact of work environments on patient and nursing outcomes is presented. The general discussion also focuses on the contextual effects of empowered workplaces and group processes on individual-level nurse attitudes and behaviour. Conclusions drawn from this study are then noted. A discussion of the implications of the

study findings to practice, policy and education are provided followed by the strengths and limitations of this research. The chapter closes with a discussion of directions for future research and an overall summary.

Discussion of Findings

The majority of studies examining nursing work environments have not attended to the impact of these environments on processes and outcomes that occur at a group level. As well, there have been few studies that have captured the influence of the specific context of the patient care unit on nurse and patient outcomes. Since nurses working within a given unit are exposed to similar environmental factors, it is likely that there are shared perceptions of the quality of the workplace and group processes. Similarly, nurse-sensitive patient outcomes such as patient satisfaction and adverse events (e.g. falls) arise from the collective efforts of many nurses working on a given unit. As such, the measurement of work effectiveness in the form of patient outcomes needs to be captured at the unit or group level. As well, a "single-level perspective can not adequately account for organizational behaviour" since individual attitudes and behaviour are influenced by unit-level contextual factors (Kozlowski & Klein, 2000, p.7). In this study, cross-level effects of empowering work environments and group processes were tested as contextual influences on individual-level nurse job attitudes and behaviour. Moreover, the use of multilevel structural equation modeling provided the simultaneous evaluation of relationships between variables at different levels that has the advantage of evaluating causal processes while including the assessment of measurement error (Byrne, 2001) to create a more accurate representation of the phenomena of work environments and related nurse and patient outcomes.

This is the second study found to date to test a multi-level model of the impact of nursing work environments on nurse attitudes but the first to include patient outcomes. The results indicate that nurses who had access to structurally empowering factors functioned better as a team and were able to achieve higher levels of nurse-assessed quality of care and lower levels of risk for patient-related adverse events. At the individual level, nurses who felt more empowered psychologically were then more likely to engage in empowered behaviours leading to both job satisfaction and higher levels of nurse-assessed quality of patient care. Feeling more empowered had both direct and indirect effects on these nurse outcomes.

Structurally empowered workplaces, as a group-level construct, accounted for a promising albeit non-significant portion of the variance in individual psychological empowerment (described in more detail on page 127). This more complete examination of work environments offers a broader understanding of the impact of the nursing workplace on nurses and patients. In addition, empowerment theory has been extended to include the multi-level perspective regarding the consequences of empowered workplaces for nurses and patients. Finally, additional support for the validity of structural empowerment as a group-level construct was achieved. Laschinger, Finegan and Wilk (2009) examined structural empowerment at the group level but had higher within-group agreement and between-group variance. Greater within-group agreement in the Laschinger et al. study may have resulted from a more homogenous group as only RNs were included while the sample in the current study included both RNs and RPNs. Lower empowerment scores have been reported for RPNs in earlier studies (DeCicco, 2006, Tuer Hodes in Laschinger, 2004). Greater between-group variance may have arisen from the broader mix and number of units sampled in the Laschinger et al. study. For example,

specialty areas such as critical care and emergency departments may have differing levels of empowering work conditions than medical and surgical settings. Seibert, Silver and Randolph (2004) tested empowerment climate at the group-level with a sample of workers from a high-tech manufacturing company. Using a structural form of empowerment, a referent-shift compositional model was used to create the group-level construct, as opposed to shared consensus model as in the current study. Empirical support was also found for structural empowerment as a group-level construct. Together, these results offer further understanding of the contextual effects of empowerment operating at the group level in an organization. i.e. effects on group-level outcomes as well as effects on individual job attitudes and behaviours. A more detailed discussion of the findings related to group-level, individual-level and cross-level effects of the study model are presented next.

Effects of work environments on patient outcomes.

The first two aims of the study were to determine the impact of empowering work conditions on group processes that contribute to work effectiveness as measured by subjective and objective measures of patient outcomes. Staffing (HPPD) and the patient's length of stay (LOS) were incorporated in the study model as control variables for the patient outcome measures. The intent of the study was to determine the impact of work environments on patient outcomes that occurs above and beyond the influence of staffing, a well established predictor of patient care quality (McGillis Hall, Doran & Pink, 2004). In the current study, there was a moderate inverse correlation between staffing and falls ($r= -.37$, $p<.01$) as well as nurse-assessed risk ($r= -.43$, $p<.01$). Therefore, increased staffing levels were associated with fewer risk-oriented outcomes. In addition, as patients become more ill, there are many confounding variables influencing their overall care

experience. The risk of adverse events becomes greater as their care becomes more complex. In place of performing risk adjustment, the patient's length of stay was used as an indirect measure of the patient's severity of illness. The LOS was moderately and inversely related to inpatient satisfaction (r= -.45, P<.01) and the rate of falls (r=.30, p<.05) in this study. By accounting for severity of illness using LOS in the study model, the specific impact of structural factors within the work environment on patient outcomes could be examined.

Structural empowerment.

Nurses were moderately empowered ($\overline{X}$ =17.58, SD=1.56, range 19-30) similar to other hospital-based staff nurses as reported in studies from 1992-2003 ($\overline{X}$ =17.73; Laschinger 2004) although these studies were conducted at the individual level. In the more recent multilevel study where structural empowerment was analyzed as the group level (Laschinger, Finegan & Wilk, 2009), the mean score was much higher ($\overline{X}$ =19.44). In the current study, nurses worked in medical and/or surgical units and included both RNs and RPNs. In the Laschinger et al. study, only RNs were surveyed and 41% of the sample was drawn from medical-surgical units with the remaining units spanning critical care, maternal child, mental health and rehabilitation specialties. Higher levels of empowerment have been reported for RNs as compared to RPNs (DeCicco, Laschinger & Kerr, 2006; Laschinger 2004). Nurses working in specialized units may have greater access to empowering conditions due the higher visibility of their role and greater networking opportunities with interdisciplinary team members and departments. Of the 6 dimensions that comprise structural empowerment, access to resources ($\overline{X}$ =2.58, range 1-5, SD=.39) and formal power ($\overline{X}$ =2.24, SD=.34) were the lowest ranked factors.

Resources and formal power have been the weakest empowerment factors reported across a series of studies examining workplace empowerment for staff nurses from 1992-2003 (Laschinger, 2004) and thereafter (DeCicco et al., Laschinger, 2008).

Teamwork.

Campion, Papper and Medsker (1996) recommended that a supportive context for teams should include adequate supports, resources, information and encouragement. This recommendation is supported by the findings of the current study. The presence of structurally empowering factors in the workplace had a large positive effect (β=.64, p<.001) on group processes as hypothesized. Nurses having access to opportunities, supports, information and resources, were able to work more interdependently by supporting one another, communicating and cooperating, sharing workload and developing a sense of potency or team spirit. The nurses in this study functioned better as a team ($\overline{X}$ =4.75, SD=.53) than non-professional clerical staff ($\overline{X}$ = 3.63; Campion, Medsker & Higgs, 1993) although they had slightly lower scores when compared to a sample of non-healthcare knowledge-based workers ($\overline{X}$ = 5.16; Campion, Papper & Medsker, 1996). Some of the differences may reflect variations in the context and roles of these comparison groups e.g. differences in the availability of resources, opportunities to use advanced skills, or availability of the manager for support. If nurses had access to the factors that helped them work effectively as an individual, there was possibly more time available for them to participate in team-oriented processes such as helping other nursing colleagues on their team to accomplish their patient care responsibilities. Empowering conditions therefore can promote positive working relationships among nurses as they interact to accomplish their work. Based on the results of this study,

structural empowerment factors represent a set of antecedent conditions that can impact team functioning in a healthcare environment.

This study adds to the limited research examining nurse-nurse interactions as much of the current research has focused on interdisciplinary teams with the exception of Kalish, Weaver and Salas (2009) who examined nursing-specific teams. In their qualitative study of acute care nurses, they obtained support for the presence of several team processes that were also relevant in the current study including interdependence (shared mental models), shared workload (back-up behaviour), support from team members (leadership) and communication. Their study did not address contextual factors that influenced these processes.

Not only does this study expand upon our understanding of relevant contextual variables that enhance teamwork, but the contextual factors have been elucidated at the group-level which is fundamentally the level at which teams operate, a shortcoming of most of these previous studies. In a recent policy synthesis on teamwork in healthcare, recommendations to enhance team functioning incorporated structurally empowering factors such as information, resources and feedback (Canadian Health Services Research Foundation, 2006b).

Work effectiveness and patient outcomes.

Quality outcomes.

The quality-oriented patient outcomes in the current study were derived directly from patients as they shared their views on satisfaction with the quality of nursing care received as well as how well they thought they could manage their care when discharged home i.e. therapeutic self care. Unexpectedly, no significant relationship was found between empowering workplaces, teamwork and these quality outcomes. Although the

instrument used to measure patient satisfaction had demonstrated discriminant validity in a previous study (Laschinger, McGillis Hall, Pederson & Almost, 2005), in the current study there was little variability between subjects. Patients were overall very satisfied with the care they had received as they were in the Laschinger et al. study. The overall quality of nursing care ($\overline{X}$ =4.45) was higher as well than in this previous study of medical and surgical patients in Ontario ($\overline{X}$ =4.06). A recent concentrated effort across the province to improve patient satisfaction may account for higher level of satisfaction but may have also been due in part to the recruitment method. Although nurses on each unit were instructed to offer the survey to any patient scheduled for discharge within 24 hours, they may have introduced some bias by possibly distributing the survey to patients who were more likely to complete it i.e. those who appeared to be more satisfied with their care experience. In other studies, the satisfaction surveys were mailed to the patient's home thereby avoiding this possible source of bias.

The inability to detect an effect of the nurses' work environment on patient outcomes may also be due to a power issue related to the sample size of 61 units. In a related group-level study, Bae (2008) was able to detect a small effect of group processes on patient satisfaction based on a sample of 268 medical-surgical units from across the United States. In this latter study, patient satisfaction scores were likewise high with little variation across subjects ($\overline{X}$ = 3.43, range 1-4, SD .22). Therefore, it is possible that a Type 2 error, or false negative result, could have occurred as a result of the small effect size and small sample size in the current study. Alternatively, other investigators applying a multi-level model to examine patient satisfaction found that unit characteristics accounted for less than one percent of the variance in patient satisfaction and that the

episode of care (e.g. patient-provider interaction) and individual patient characteristics accounted for the main differences in patient satisfaction (Aiello, Garman & Morris, 2003). While this outcome is plausible, the study also suffers from a few design flaws, previously described in Chapter 3, therefore rendering the conclusions to be more tenuous.

Nurses also evaluated the quality of care from their professional perspective. The mean value of the single-item for overall quality of care was 3.26 out of a possible 4.00 for this group-level variable. No other group-level comparators were found in the literature. Correlational analyses indicated only a weak relationship ($r = 0.25$, $p<.05$) between nurse and patient assessments of the quality of nursing care. This is consistent with previous research but may be one of the first studies to empirically test the association between patients' and nurses' assessments of quality care. Nurses therefore likely use different criteria by which to judge the effectiveness of their work and thereby the quality of care delivered. Patients may judge quality by what is important to them i.e. caring and concern, competence, privacy, etc. while nurses may judge quality by the care they wanted to provide as a professional versus the care they were able to provide given the constraints within the work environment.

There was also little variability in the therapeutic self care (TSC) measure of quality as patients felt well prepared to manage their care when discharged home ($\overline{X}$ =4.04, range 1-5, SD=.38). This measure evaluated the patient's ability to engage in self-care activities such as taking medications, managing symptoms, performing activities of daily living and managing their health condition (Sidani & Doran, 2004). In previous studies of medical-surgical patients across Ontario, the mean scores for TSC were

somewhat higher (4.37-4.47) than in the current study despite data collection occurring prior to discharge in all studies (Irvine Doran , Sidani, Keatings & Doidge, 2002; Doran et al., 2006). It is possible that the patients in the current study had an overall lower level of functional ability accounting for the lower TSC scores. Support for this assumption was found within the nurses' assessment of the quality of patient care. Forty-two percent of nurses noted that they were only somewhat or not at all confident that the patients were ready to manage their care after discharge. As well, 45% of patients reported their general health as poor to fair. This is consistent with the current trend of higher acuity and greater complexity of care observed in hospitalized patients. Given that TSC and self-rated health were moderately correlated ($r = .41$, $p<.01$), perhaps TSC was influenced more by patient's overall health status and disease state than by the quality of the work environment.

Empowering work environments, fully mediated by group processes, had a large significant indirect effect on nurse-assessed quality of care ($\beta=.61$, $p<.001$). Therefore, structurally empowering factors within the work environment played a key role in the nurse's ability to deliver quality patient care primarily through the impact on teamwork processes. When nurses had access to information and resources needed to perform their clinical roles, then the quality of care improved. Support in the form of feedback and problem-solving advice as well as opportunities to learn and use new skills and knowledge also facilitated their ability to deliver quality care. Likewise, the quality of nursing care was also enhanced when the clinical role of the nurses had a degree of flexibility and visibility along with opportunities to network with other nurses and health care professionals across the organization to solve problems. The results of this study are consistent with a number of studies that have obtained empirical support for the direct

effect of structurally empowering workplaces on the quality of patient care from the nurse's viewpoint (Donahue, Piazza, Quinn Griffin, Dykes & Fitzpatrick, 2008; Laschinger, 2008; Laschinger, Finegan, Shamian & Wilk, 2001; Robertson, 2003). Together, this body of evidence supports the hypothesis that enhancing structurally empowering factors within the workplace can lead directly and indirectly to an improved quality of care for patients.

The evidence obtained in the current study supported the hypothesis that empowering working conditions that enhance the work effectiveness of the individual also enhanced the effectiveness of teams. Group processes exhibited a large positive effect on nurse-assessed quality of care. By working together to complete patient care activities, as demonstrated by better communication, cooperation and support, it is possible that time could be used more efficiently to better meet patient care needs thereby leading to fewer risks and better quality nursing care. Nurses working interdependently as a collective may also have a greater awareness of patient needs beyond their own assignment. Thus nurses working with a strong team spirit and team orientation would more likely be aware of other patients' needs and would be better positioned to assist when needed throughout the shift.

The integrative approach used in the study model that considered input, process and outcome variables enabled a more thorough examination of teams (Campion, Medsker & Higgs, 1993; Stock, 2004) and addressed a current gap in our understanding of how workplace factors affect patient outcomes. In addition, empowerment theory has been extended to include teamwork as mediator contributing to work effectiveness. While there are no studies to date addressing the empowerment-work effectiveness link at the group-level within nursing, the results of this study are consistent with another group-

level study of empowerment, teamwork and work outcomes within the business sector (Mathieu, Gilson & Ruddy, 2006). Mathieu et al. found that empowered employees exhibited improved team functioning that, in turn, accounted for higher levels of customer satisfaction.

Within acute care settings, the relationship between group processes and quality patient outcomes is consistent with previous research where a teamwork culture had a positive effect on patient care quality and patient satisfaction (Meterko, Mohr & Young, 2002; Rondeau & Wagar, 1998; Shortell et al., 1995). Bae (2008) found that work group cohesion (β=.09, $p<.001$) and relational coordination, including communication among nurses (β=.16, $p<.05$) predicted higher levels of patient satisfaction although the effect size was small. The small effect size may be due to the use of patient-assessed versus nurse-assessed quality of care measures. In the current study, a different set of group processes were evaluated (i.e. communication and cooperation, workload sharing, social support, team spirit and interdependence) and had a moderate effect on nurse-assessed quality of care although no significant effect on patient-assessed outcomes. The greater effect size in the current study could be due to the specific the group processes evaluated as compared to those measured in Bae's study.

In two prior studies of work group characteristics using the same instrument as in the current study, processes such as team spirit, social support, workload sharing, communication and cooperation within the team as well as task interdependence were all found to be significantly correlated to various measures of performance (Campion, Medsker & Higgs, 1993; Campion, Papper and Medsker, 1996). The strength of these relationships were higher for the professional knowledge-based workers than non-professionals (.22- .69, $p<.05$ versus .14-.38, $p<.05$ respectively). In the current study,

the significant correlation between group processes and the performance measure of nurse-assessed quality of patient care ($r=.64$, $p<.01$) is consistent in magnitude with the findings for the knowledge-based workers although no significant associations were found for the other quality and risk patient outcomes. Some of the variation may be accounted for in the types of performance measures used e.g. productivity indicators versus quality/risk outcomes.

Looking beyond the mediating effects of group processes, other group-level studies have also provided supportive evidence of the empowerment-work effectiveness relationship. Seibert, Silver and Randolph (2004) found that structurally empowering work conditions were associated with high levels of performance ($\beta=.48$, $p<.01$) among engineers. Chen, Kirkman, Kanfer, Allen and Rosen (2007) studied 62 shipping and receiving teams of a home improvement company and found that when team members were highly interdependent, psychological empowerment (at the group and individual level) positively predicted team performance ($\beta=.61$, $p<.05$) and individual performance ($\beta=.29$, $p<.05$).

Therefore, findings of the current study support previous research in healthcare and non-healthcare settings regarding the critical relationship between structurally empowering workplaces, effective group processes and overall work effectiveness. The study also addresses limitation of former studies in that the analysis was completed at the group level, included units from a myriad of organizations, and evaluated the relationships between team inputs, processes and outcomes simultaneously.

Risk outcomes.

The average rate of falls across the units was 4.91 per 1,000 patient days. Fall rates in other published studies have ranged from 2.2-3.73 per 1,000 patient days for

medical and surgical units in the United States and Switzerland (Mulvey Boyle, 2004; Cina-Tschumi, Schubert, Kressig, De Geest & Schwendimann, 2008; Donaldson, Storer Brown, Aydin, Burnes Bolton & Rutledge, 2005; Dunton, Gajewski, Taunton, & Moore, 2004). For other risk outcomes, the percentage of adverse events occurring occasionally or frequently was 12-22% higher in the current study than reported in a comparative study involving nurses from across Canada, with the exception of patient and family complaints (Aiken et al., 2001). Despite a call to action, the results suggest that the patient safety indicators, measured in this study, have deteriorated rather than improved over the past decade.

Falls were measured using an objective data source, i.e. hospital databases. Nurses' assessments of patient risk included the frequency of occurrence of falls over the past month as well as medication errors, nosocomial infections and patient/family complaints. These nurses' assessment of these adverse events was moderately correlated with the rate of falls ($r=.44$, $p<.01$) and 49% of nurses reported falls had occurred occasionally to frequently. These findings suggest that nurses' perceptions offered a valid view of patient risk in this study. This result supports the findings of an earlier study examining the consistency of falls rates measured by nurses perspectives and by incident reporting systems in Switzerland where the two measures were highly correlated ($r=.63$-$.69$; Cina-Tsumi, Schubert, Kressig, Geest & Schwendimann, 2008). Mulvey Boyle (2004) suggests that reporting systems offer only a conservative estimate and that adverse events are likely underreported as they depend on nurses finding additional time for this documentation. The results of this study support the use of nurse-assessed adverse events as an indicator of patient safety.

While empowered work environments supported the delivery of quality care, the lack of these structurally empowered conditions contributed to increased risks for the patient. In units where nurses experienced low empowerment in their work environment, nurses had lower team process scores and higher rates of patient falls and nurse-assessed risks occurred. This result reinforced the critical link between quality workplaces and patient safety found in other reports (Institute of Medicine, 2004; Quality Workplace Quality Healthcare Collaborative, 2007). Adequate staffing has been well established as a key contributor to patient safety but the results of this study indicate that the quality of the work environment exerts an effect over and above the impact of staffing on patient risk. The direct effect of group processes ($\beta = -.19$, $p < .05$) and the indirect effect of structural empowerment ($\beta = -.12$, $p < .05$) were statistically significant contributors to lower rates of falls after controlling for staffing and patient length of stay. For nurse-assessed risk, the indirect effect of structural empowerment had a statistically significant effect on lower incidences of adverse events ($\beta = -.11$, $p < .05$) although staffing ($\beta = -.44$, $p < .001$) and patient length of stay, as an indicator of the patient's severity of illness, ($\beta = .31$, $p < .01$) were stronger predictors. Together, 29% of falls and 31% of nurse-assessed risk were accounted for by the quality of the work environment, teamwork, as well as staffing and length of stay.

Based on the evidence from this study, there is support for the proposition that patient safety and the reduction of adverse events can be achieved by creating more structurally empowering work environments. Workplaces that promote work effectiveness by increasing the nurses' access to resources, support and guidance, information and opportunities to develop skills can thereby enable nurses to interact with patients with sufficient frequency and skill to prevent the occurrence of risk. This is

consistent with a previous unit-level study by Mulvey Boyle (2004) where the rate of patient falls was lower when nurses in those units experienced more autonomy, collaboration and support from their managers. In an individual-level study using other work environment characteristics, investigators found significant relationships between the quality of the work environment and nurse-assessed adverse patient events (Laschinger & Leiter, 2006). Staffing adequacy (β= -.13) and the use of a nursing model (β= -.25) had direct relationships to these risk outcomes. While the findings are similar, the current study provides evidence that was obtained at the unit-level, included multiple hospitals and the influence of staffing was controlled, all of which were design limitations found to some degree in the aforementioned studies.

The role of staffing (HPPD) and skill mix (proportion of RN staff) have been identified as important variables associated with various quality and risk outcomes. In a systematic review of international studies published since 1990, two thirds of the studies found a link between nurse staffing, skill mix and falls (Lankshear, Sheldon & Maynard, 2005). Results of the current study add to this growing body of evidence. The rate of falls and the frequency of nurse-assessed patient risks were inversely proportional to staffing and to the proportion of RNs in the total staff mix. That is, as staffing levels decreased and fewer RNs made up the staffing complement, a larger number of falls were likely to occur. The strength of the current study lies in the use of unit-based staffing measures (as opposed to a general hospital-based value) adding to the validity of the comparisons. Since risk adjustment could account for some, but not all, of the associations found between staffing and patient outcomes (Lankshear et al.), risk adjustment was included by controlling for the patient's LOS in the analysis.

Taken together, quality work environments characterized by well functioning teams along with staffing levels to meet patient care needs could be proactive strategies to reduce patient adverse events. While the cost of these improvements may seem prohibitive in times of fiscal restraint, the cost of adverse events, that do not get factored into balance sheets, may in fact be avoided to offset the expenditures related to implementing empowering work environment strategies. In a systematic review of nursing-sensitive patient outcomes, the average cost of a patient fall was calculated to be an additional $7,118 in medical costs arising from treatment and an increased length of stay (Dall, Chen, Seifert, Maddox & Hogan, 2009). The estimated cost of adding one RN to the staffing plan was calculated to be a reduction in medical costs equivalent to 72% of the total labour cost for the RN. The calculation reflected only a subset of nursing value and did not reflect additional benefits such as reduced pain and suffering experienced by patients and families, litigation payouts, improved work environments and reduced turnover. Other workplace improvement strategies that serve to improve the nurse's access to opportunities for development, managerial support and technical information may also require time to be built into the nurses' workday. If staffing levels are low, it is probable that the nurses also do not have the time to participate in workplace improvement strategies thereby undermining the effectiveness of these initiatives. Therefore, a comprehensive cost-benefit analysis of staffing strategies must be considered to ensure safe patient care and quality workplaces.

Effects of work environments on nurse outcomes.

The second area of focus for the study was the impact of work environments on nursing outcomes. Three relationships were examined: the effect of psychological empowerment (feeling empowered) on empowered behaviour (acting empowered), as

well as the direct and indirect effects of psychological empowerment on the nurse outcomes of job satisfaction and quality of care delivered. A discussion of each set of results follows.

Years of nursing experience was used as a control variable based on the significant correlation found between experience and the individual-level variables in the study model, with the exception of patient care quality. As nurses gain more experience, they are likely to also develop more advanced competencies and expertise. Experience and expertise may reflect antecedent conditions for psychological empowerment, the use of proactive problem-solving behaviours and also contribute to one's overall sense of satisfaction from the job. Ahearne, Mathieu and Rapp (2005) have conceptualized this phenomenon as 'empowerment readiness' that arises from the individual's years of experience and tenure within an organization. They define empowerment readiness as the level of "task-relevant knowledge and experience that will enable them (employees) to benefit from, and be successful in, an empowered environment" (p. 948). In the current study, nurses had an average of 12 years in their current role and 18 years nursing experience in total. As such, this variable was controlled in order to isolate the unique effects of psychological empowerment on nursing behaviours and outcomes.

Psychological empowerment.

The high level of psychological empowerment experienced by nurses in this study ($\overline{X}$ = 3.82) was similar to another recent study of staff nurses across Ontario (3.89; Laschinger, Finegan & Wilk, 2009). Nurses felt slightly more empowered than a sample of nurses from urban hospitals in the province ($\overline{X}$ = 3.59; Laschinger, Finegan, Shamian & Wilk, 2001). The relatively high level of psychological empowerment across studies

suggests that nursing work, by its nature, is meaningful work. Autonomy and impact were the lowest scores of the four dimensions of psychological empowerment in the current study and in the 2001 study. The ability to act empowered may be limited by the autonomy permitted within the staff nurse role.

Empowered behaviour.

Nurses in this sample participated in empowered behaviours only moderately ($\overline{X}$ = 5.28) as compared to a subsample of acute care nurses ($\overline{X}$ = 7.80; Irvine, Leatt, Evans & Baker, 1999), critical care nurses ($\overline{X}$ =7.55; Suominen, Leino-Kilpi, Irvine Doran & Puukka, 2001), multidisciplinary team members ($\overline{X}$ =7.64-7.76; Kuokkanen et al., 2007) and nurse managers ($\overline{X}$ =8.18; Suominen, Savikko, Puukka, Irvine Doran & Leino-Kilpi, 2005). The primary difference is that the instrument used in the current study was revised to capture the frequency with which the nurses engaged in empowered behaviours as opposed to measuring confidence in their ability to execute these behaviours. It is possible that one might have the confidence but not the opportunity to enact empowerment-related behaviours.

Nurses who felt more psychologically empowered were more likely to engage in empowered behaviours. This medium-sized effect (β=.47, $p<.001$) suggests that work environments that enable nurses to feel more autonomous, self-efficacious and that support meaningful work with visible impact can likewise encourage the use of empowered behaviours such as proactively solving problems, speaking up on issues of concern and bringing about improvements in their work. This is one of few studies that have addressed the link between feeling empowered and acting empowered among nursing professionals. Similar to the concept of empowered behaviour, Knol and van

Linge (2009) describe recognizing problems, generating ideas, mobilizing support and implementing ideas as innovative behaviour. They found that psychological empowerment accounted for 28% of the variance in innovative behaviour among acute care nurses in Holland. Similarly, Sprietzer (1995) reported a path coefficient of .30 ($p<.001$) for the relationship between psychological empowerment and innovative behaviour among managers and non-managers in the business sector. Therefore, there is support for psychological empowerment having the motivational potential to encourage nurses to engage in empowering behaviours.

Educational institutions strive to develop the critical thinking and problem-solving skills of student nurses so that they can function autonomously and engage in actions to create change within their workplace. Nurses entering the workforce therefore expect environments that will promote the expression of these skills. Organizations benefit from the input and solutions generated by nurses who function at the point of care as they can offer useful insights into patient care and unit operations. Based on the findings of this study, creating conditions to build individual psychological empowerment may be one way to promote empowered behaviour.

Job satisfaction.

Nurses were only moderately satisfied with their job ($\overline{X}$ =2.85, range 1-5) which is consistent with other studies of nurses across Ontario using the same job satisfaction measure ($\overline{X}$ =3.33, Laschinger, 2008; $\overline{X}$ =2.78-2.90; Laschinger, Finegan, Shamian & Wilk, 2004;) . In the current study 40% of the nurses were satisfied overall with their jobs as compared to 49.7% for nurses across England (Shields & Ward, 2001). Buerhaus et al. (2005) reported better results where 83% of nurses were a little satisfied to very satisfied

with their job which was consistent across two time points (2002 and 2004). This can be explained in part by the use of a different survey instrument and rating scale. In this latter study that included a national sample from the United States, a smaller proportion (21-34%) of nurses was very satisfied with their job. The results of the current study indicate the need for continued attention to the factors that will improve the level of satisfaction experienced by hospital-based direct care nurses.

Nurse-assessed quality of care.

This variable was measured and analyzed at the individual level for this component of the study model. The overall quality of nursing care delivered, as assessed by nurses, was high with a mean of 3.31 (range 1-4), similar to a recent study of Ontario nurses ($\overline{X}$ =3.45; Laschinger, 2008). Using another of the four quality items from this measure (quality of care on the last shift), care was rated as fair or poor by 7.7% of the nurses as compared to 15.4% in an earlier province-wide study (Aiken, Clarke & Sloan, 2002) and 20% in an American study focused on acute inpatient care (Sochalski, 2004). The nurses in the current study therefore consider the quality of their care to be higher than in comparative studies cited. Nurses also commented that they did their best to not let their work issues affect the care that they provided.

Direct and indirect effects of psychological empowerment.

Support for empowered behaviour as a mechanism through which feeling empowered leads to job satisfaction and quality patient care was mixed. Psychological empowerment had a moderate and stronger direct effect (β=.39, $p<.001$) on job satisfaction and only a small indirect effect when mediated through empowered behaviour (β=.07, $p<.001$). The significant impact of psychological empowerment on job

satisfaction has been consistent across a variety of studies examining nursing work environments (Laschinger, Finegan, Shamian & Wilk, 2001/2004; Laschinger, Almost, Purdy & Kim, 2004). Therefore, the motivational potential of psychological empowerment can influence greater levels of nurse job satisfaction.

The small direct effect of empowered behaviour on nursing job satisfaction (β=.15, $p<.001$) may be due to the limited extent to which nurses in this sample reported being actively engaged in these behaviours. However, the small but significant effect suggests that enabling nurses to engage in empowered behaviours is an important means by which to increase job satisfaction. It appears that contributing to improved patient care processes and solving other issues that impact the work of nurses offers a source of job satisfaction.

Overall, the results of the study indicate that strategies to enhance the autonomy, self-efficacy, meaningful work and influence of nurses are likely to positively impact nurses' satisfaction with their work. It is imperative to move forward with such strategies as 60% of nurses were either neutral or dissatisfied with their job. Since job satisfaction has been shown to be a strong predictor of intent to leave one's job (Shields & Ward, 2001; Tourangeau & Cranley, 2006), it becomes more critical to address the low levels of job satisfaction particularly when facing the current and expected nurse shortages. Given that the variables of psychological empowerment, empowered behaviour and years nursing experience together accounted for only 26% of the variance in job satisfaction, other predictors of job satisfaction need to be considered when designing improved work environments.

Empowered behaviour only partially mediated the relationship between psychological empowerment and nurse-assessed quality of care at the individual level.

The hypothesis that acting empowered would result in better patient care quality was only minimally supported as the effect size was small (β=.10, $p<.05$). Instead, psychological empowerment, or feeling empowered, had a stronger influence on the nurse-assessed quality of patient care on their unit. As noted above, this result may be due to the lower than anticipated levels of empowered behaviour that were reported. Perhaps acting empowered had a greater effect on unit operations than patient-related issues although unit operations were not measured in this study. Alternatively, given that the path between nurses' empowered behaviour and the quality of care achieved statistical significance, this result may have been due to a positive effect on patient empowerment as postulated in the recently published comprehensive model of empowerment (Laschinger, Gilbert, Smith & Leslie, 2009). In the proposed model, nurse/patient empowering behaviours are viewed as a means to empower patients to optimize their own health and well-being such that the satisfaction with care will be enhanced. Therefore the results of the current study provide important initial support for this integrated model of nurse/patient empowerment and warrants further study.

Job satisfaction and quality of patient care.

Although not originally proposed, the moderate and significant relationship between job satisfaction and quality of care (β=.27, $p<.001$) could indicate that the ability to provide quality care is also an important contributor to job satisfaction. This finding is consistent with McNeese-Smith's qualitative study of factors that lead to job satisfaction and dissatisfaction (1999). Job satisfaction was influenced by "the experience of providing good care, meeting patients needs and leaving nothing undone" (p. 1334). Similarly, job dissatisfaction factors included poor quality care delivered by the nurse and/or co-workers and bad patient outcomes (McNeese-Smith). Kangas, Kee and McKee-

Waddle (1999) suggest that being able to provide quality care develops a sense of professional self-esteem within the nurse that then leads to higher levels of job satisfaction. Conversely, nurses' job satisfaction may influence the patient's satisfaction with care. Tzeng, Ketefian and Redman (2002) obtained support for their model where job satisfaction was an indirect predictor of patient satisfaction. It is possible that nurses who have a positive attitude toward their work, engage in more positive interactions with patients influencing their patients' overall impressions of the care received. Further research is needed to determine the directionality of the relationship between nurse job satisfaction and patient satisfaction. Kangas argues that the association between job and patient satisfaction needs to be examined further to identify ways in which supportive environments affect nurse-patient interactions. Further testing of the nurse/patient empowerment model developed by Laschinger, Gilbert, Smith and Leslie (2009) may illuminate this relationship i.e. testing if empowered work environments enable nurses to engage in empowering strategies that, in turn, empower the patient leading to satisfaction with nursing care.

Contextual cross-level effects.

Structurally empowering workplace factors accounted for a small non-significant but non-trivial amount of variance in psychological empowerment. The group-level effect of empowering work conditions may have been too small to detect in the sample of only 61 units. That said, the path coefficient (β=.25, p=.299) was of sufficient size to warrant further research using a larger sample (>100 for structural equation modeling; Meuleman Billiet, 2009) to confirm the hypothesis that differences in structurally empowering conditions, operating at the level of the patient care unit, could account for differences in how individual nurses react psychologically to their workplace. To date, the only other

known nursing study to examine the effect of group-level structurally empowering workplaces on individual psychological empowerment was conducted by Laschinger, Finegan and Wilk (2009) who found a strong significant cross-level effect (β=.67). The stronger relationship found in the Laschinger et al. study may be due to a broader sampling of varied types of units where nurses experienced somewhat higher levels of structural empowerment ($\overline{X}$ = 19.44 compared to 17.58 in the current study). The sample selected for this current study included nurses from medical-surgical units whereas the Laschinger et al. study had only 41% of the sample from medical-surgical units with the remaining units spanning critical care, maternal child, mental health and rehabilitation specialties. Although levels of psychological empowerment were similar in both studies ($\overline{X}$ = 3.89 compared to 3.82 in the current study), the variability in psychological empowerment at the individual level was limited as only 5% of the variance was explained by group membership in the current study.

Outside of nursing, a structural view of empowerment was used to test the impact of group-level empowerment climate on individual-level psychological empowerment among 50 project-based teams of engineers (Seibert, Silver & Randolph, 2004). A strong empowerment climate was found to be related to individual-level psychological empowerment (β=.49, p<.01) consistent with the multilevel model tested with a nursing sample described above (Laschinger, Finegan & Wilk, 2009) and as suggested in the current study. Based on these studies, research that pursues multi-level models of empowerment can generate a more comprehensive theoretical understanding of factors that impact individual nurse job attitudes and behaviour.

It was hypothesized that the relationship between psychological empowerment on empowered behaviour would be moderated by the quality of the team processes. For the nurse to engage in empowering behaviours, such as trying to proactively solve clinical or operational problems, requires the nurse to offload some of their patient care responsibilities to their team members so that attendance at meetings or investigating an issue could be accomplished. If there were effective group processes such as shared workload and cooperation, perhaps nurses who felt empowered and wanted to engage in empowered behaviours would be more likely to do so. There was no support for this hypothesis. While there was a strong relationship found between psychological empowerment and empowered behaviour at the individual level, the relationship was not affected by the differences between units in aggregate-level group processes. One explanation for the lack of effect may be that the relationship between psychological empowerment and empowered behaviour may be less sensitive to the influence of group processes than other contextual factors. For example, empowered leader behaviours may have stronger moderating effects on the relationship between feeling and acting empowered. As well, group processes other than those included in this study may exert stronger cross-level effects e.g. group cohesion. Further study of other group-level moderating variables is warranted to better understand the effect of the work environment context on individual-level cognitive and behaviour-based forms of empowerment.

Conclusions

The results of this study offer further support regarding the relationship between the quality of the workplace and nurse work effectiveness as manifested in both nursing and patient outcomes. Beyond the influence of staffing and patient's severity of illness, the structurally empowering factors in the work environment were shown to influence

quality care and reduce risk for patients. This study extends empowerment theory by identifying group processes as an important mechanism by which patient outcomes may be achieved and provides further support for structural empowerment as a group-level construct. Empowering conditions that support patient care were also found to positively influence the psychological empowerment, or the motivational state of nurses, thereby contributing to nurse job satisfaction and that could contribute to nursing retention. Therefore, evidence-based and theory-informed strategies to improve the workplace may be value-added investments enhancing patient care quality as well as nursing workforce sustainability.

Limitations

Limitations to the design of this study reflect common issues arising from multi-level approaches to examining organizational behavior. These issues include cross-sectional design, common method variance, convenience sampling, response rate, sample size (number of groups), and variations in the process for collecting patient data.

A disadvantage of cross-sectional designs is that is difficult to separate out the cause from the effect given that data is obtained at one point in time. Causal inferences are possible in cross-sectional designs if the hypothesized causes and effects in the study model are guided by theory and then causal modeling statistical techniques are employed (Polit & Beck, 2004). Structural equation modeling is a causal modeling technique used to analyze data generated from cross-sectional designs for the purpose of theory testing. The statistical techniques do not discover the cause but instead test theory-driven relationships as outlined or specified in the model (Grapentine, 2000). For the current study, the rationale provided for the hypothesized study model was described with theoretical and empirical support for proposed relationships. Multi-level structural

equation modeling was used thereby supporting the validity of the proposed cause and effect relationships between work environments and nurse and patient outcomes. The outcomes of the study must still be considered tentative until further evidence from longitudinal studies provides additional support.

Common method variance refers to potential for systematic measurement error arising from using a single source and method to collect data. Bias arising from common methods was controlled by seeking data from patients, nurses and obtaining falls data from hospital databases. Unexpectedly, data obtained from patients did not support the hypothesized relationships and the majority of data used for remaining predictor and outcome variables was obtained from nurses. The bias may have been limited to some extent by the use of psychometrically sound instruments with varying scales and anchors for predictor and outcome variables (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). As well, survey items to measure predictor variables preceded items for outcome variables thereby creating a degree of psychological separation (Podsakoff et al.).

For regression-based analyses, a random sample is the preferred sampling technique since convenience sampling may introduce bias (Burns & Grove, 2009). Some self-selection bias could be present given that the Chief Nursing Executives (CNE) and nurse managers needed to agree to the study as a condition to inviting their nurses and patients to participate. It is possible that only managers confident in the quality of their work environments and patient care may have agreed to implement the study. Contrary to this assumption, some CNEs and managers commented that they knew their units had workplace issues and wanted to participate in order to obtain an objective assessment that they could then use to argue for increased resources. While nurses and patients were not selected randomly within the unit, the total population of eligible nurses on each unit was

approached to complete a survey. There was no specific order in which patients were asked to participate and it was assumed that there was no inherent pattern in when they were discharged from the unit.

The response rate for nurses was 34% raising concerns about the representativeness of the sample. Response rates for published studies of nursing research are often over 60% (Badger & Werrett, 2005) although designs using self-report surveys are in the range of 40% (May, 2001). While nurse surveys were personalized to include the name of each nurse, it is possible that many nurses did not receive their survey due to poor mail delivery systems on some units. It is possible that the actual number of surveys distributed was lower than originally noted thereby artificially lowering the response rate. Overall sample size of 61 units was likewise a limitation as discussed previously (refer to p. 45).

Instructions were provided verbally and in writing for nurses assisting with the distribution and collection of patient surveys although there were no guarantees that the instructions were followed as intended. Patients may have responded differently to their assigned nurse as opposed to another unit nurse, the hospital volunteer or the investigator. Differences in the patient satisfaction and therapeutic self care related to the type of data collector were assessed using ANOVA and no significant differences were identified.

On balance, the results of the study must be considered with an element of caution based on the limitations discussed above. Future studies are needed to overcome these limitations and validate the conclusions reached in this research.

Implications

Practice and administration.

The results of this study indicate that work environments characterized by structural and psychological empowerment factors may enhance the quality of patient care, reduce patient risk and increase nurses' job satisfaction. The patient safety agenda needs to include a focus on improving the work environment as a means to reduce patient risk. Unit-based comparisons of empowered workplaces and outcomes served to differentiate between superior and less optimal workplaces. It is therefore possible, even in these difficult economic times, for managers and organizational leaders to create empowering conditions conducive to work effectiveness. The application of empowerment theory can guide the selection of strategies to enhance both patient and nurse outcomes.

Strategies to improve the workplace are readily available as evidenced in the many databases of best practices generated by healthcare and professional organizations such as the Canadian Nursing Innovations Exchange sponsored by the Canadian Nurses Association. According to structural empowerment theory, workplace improvement initiatives that address any or all of the dimensions of opportunity, information, resources and support hold promise to increase the outcomes noted in the current study. For example, mentoring and career coaching programs can be a source of support and growth opportunities. Access to online internal and external information sources can make information more readily available for clinical care decision-making. Staff resources (e.g. educators and clinical nurse specialists) are likewise keys to ensuring innovative practices are implemented, staff is supported and knowledge needs are met through the availability of expert consultation. Staffing levels were found to be the largest predictor of falls and

nurse-assessed risk indicating that adequate resources are critical workplace factors. Other low or no-cost strategies can be employed through the use of empowering manager/leader behaviours such as sharing information, providing regular feedback on performance or changing assignments to ensure growth opportunities in clinical and leadership skills (Laschinger, Gilbert, Smith & Leslie, 2009). The nurses' sense of power that increases access to these structural factors can be supported by assisting nurses to develop their internal and external networks. Interdepartmental committees and involvement in project work are structures to support networking. As nurses are given opportunities for development, the formal roles that they are given within these projects or committees can be communicated and rewarded so that their contributions are made visible throughout the organization thereby building their formal power as well.

The motivational potential of psychological empowerment can be capitalized upon by implementing strategies that serve to promote meaningful work, self-efficacy, autonomy and impact. While the delivery of quality care is inherently meaningful, other challenge and growth opportunities must be seen as meaningful by the individual nurse otherwise the intended effects may not be realized. Providing adequate orientation and timely feedback can help to build the nurse's sense of mastery for new skills so that they have confidence to use the skills in the future. Autonomy can be developed by broadening the nurses' scope of decision making regarding care and operational issues. This might take the form of unit-based councils or may be less structured and include opportunities for more decisional latitude regarding the management of daily issues. Helping the nurse to see the impact of their work and the influence they hold in creating positive change for patients and their workplace will also build the cognition of feeling empowered.

Together, strategies to enhance structural and psychological empowerment may also encourage nurses to engage in empowered behaviours. Involvement in unit councils or committee work can provide the forum for nurses to exercise verbal empowerment by sharing or debating their point of view. Behavioural and outcome empowerment behaviours can also be promoted within committee work as the nurses achieve success in learning new skills or solving work problems. If manager roles are too broad to lead these initiatives, then the manager can consider organization-wide resources to assist nurses with these new levels of involvement. For example, educators or organizational development staff can work with nurses to develop their planning and change-management skills. Overall, a top-down and bottom-up approach is recommended. Top-down strategies refer to specific initiatives that require manager intervention, resources and a detailed plan for implementation e.g. mentoring programs. Bottom-up strategies refer to those ideas that are generated and validated by staff as being important to improving their workplace. McGillis Hall, Doran and Pink (2008) evaluated the impact of work environment improvement strategies that were designed using staff nurse involvement. Over a six-month period, a statistically significant difference in overall perceptions of the quality of the nursing work environment was found as a result of the changes developed by the nurses. To honour the principle of autonomy, nurses need to have input into the plan for enhancing their workplace.

As a key dimension of structural empowerment, resources in the form of staff, time, equipment and supplies are essential to achieving patient and nurse outcomes. One approach to enhance resources is to make a business case for the investment. By conducting a value-proposition analysis, a more complete picture of the costs, benefits and value associated with adding staff and equipment can be determined. Cost

avoidance, by reducing patient risk and harm as well as the negative nurse outcomes such as turnover, absenteeism and overtime, is also important to add into the cost-benefit equation. Therefore, enhancing resources to improve nursing work environments can be shown to add value at the level of the patient creating a more compelling case for this investment.

A second approach, that does not involve increasing resources, is the strategy to use existing resources more effectively through job redesign and process improvement. The National Health Service (NHS) program entitled "The Productive Ward: Releasing time to care" is a promising strategy designed to enhance efficiency and use of resources. Preliminary results indicate that staff has found more time to provide direct care, teamwork was improved along with calmer working environments, improved job satisfaction for nurses and fewer patient falls (NHS Institute for Innovation and Improvement, 2010). The program reflects key tenets of workplace empowerment, is staff-driven, manager supported and evidence-based (NHS Institute for Innovation and Improvement).

Both types of strategies will be needed to meet the challenge of an increasing demand for health care and a concurrent shortage of nurses. Ongoing monitoring of work environment indicators, such as those included in this study, will be essential for organizations to track the impact of investments made in resources and workplace improvements.

Often educative strategies are used to improve team functioning but the current results demonstrate the importance of empowering factors to facilitate greater nurse-to-nurse support, workload sharing, communication and cooperation. Organizational development approaches to improve team functioning often focus on creating awareness

and improving processes that characterize effective teams. By addressing contextual factors in the work environment such as resources, information , support and opportunities, it is possible to reap better gains in team effectiveness. For example, assessing teams for their resource and informational needs, ensuring that the teams receive feedback on their performance and are given new challenges may help the team members to work more interdependently, cooperatively and with improved communication. A better understanding of nursing team processes that lead to improved work effectiveness can also guide both the design of nursing work groups and interventions to further enhance their productivity (Campion, Medsker & Higgs, 1993).

Policy.

This study adds to the growing body of evidence regarding the link between quality work environments, improved patient outcomes and nurse job satisfaction. The results of this study can be used to further advocate for policies that will enable both the implementation of work environment improvement strategies but also the resources that will be required to sustain them such as adequate staffing. In Ontario, the Nursing Secretariat and HealthForce Ontario have provided one-time funding for pilot projects within various healthcare organizations. In the adjudication of proposal requests, policy makers could apply criteria that reflect the key dimensions of structural and psychological empowerment as these theory-informed and evidence-based approaches have been shown to yield important outcomes for patients and nurses.

To improve the impact of the initiatives, protected and continuous funding is needed as change often takes longer than a budget year to implement and become embedded in an organization so that intended outcomes can be realized. For greater impact of dollars invested, regional approaches through Local Health Integrated

Networks (LHINs) could be used whereby sister organizations could share resources and skills in preparing proposals for funding and work collaboratively on strategy implementation. Continuous funding could be contingent on such collaborations as well as demonstration of outcomes. The nurse and patient outcomes such as those used in the current study would provide performance measures of interest to policy makers whose role includes ensuring quality health care, patient safety, efficiency and adequate human resources to deliver nursing care. Partnering between the LHINs and academia could facilitate ongoing research involving a large enough sample to identify work environment interventions that have the most promise. While progress has been made on the issue of healthy work environments for nurses, a greater and more comprehensive action plan is needed as nurses continue to experience only moderately empowering workplaces, are dissatisfied with their job and these working conditions impact on the ability to provide high quality low risk patient care.

Education.

In the process of socializing students into the nursing profession, curriculum that includes the dynamics of the work environment would enhance the student's ability to identify healthy workplaces for future employment and also instill a sense of responsibility for improving workplace conditions that would benefit nurses and patients. Leadership courses could reinforce the leader's and follower's role in creating an empowering work environment. Tools and techniques associated with various forms of empowered behaviour could be included to encourage nurses in direct care roles to provide meaningful input into planning changes to the work environment. A solution-focused orientation, guided by empowerment theory, could be included in course activities, assignments and practicum experiences during undergraduate, graduate and

continuing education programs. In this way, students will be educated to be aware of, value and take action to achieve healthy work environments.

Future Research

Next steps in understanding the effects of work environments on nursing and patient outcomes includes the need to validate the findings by replicating the multi-level design using a larger number of units and continuing to examine structural empowerment as a group-level construct. A longitudinal design could be used to further validate the causal model tested in this study where empowered work environments were linked to outcomes reflective of nursing work effectiveness.

Future research is needed on related variables, samples and settings to better understand human health resource issues beyond nurses in acute care. In the current study, a set of four nursing-sensitive patient outcomes were analyzed. Subsequent research could include other outcomes such as those already captured in the provincial database as part of the HOBIC initiative e.g. pressure ulcers and pain symptoms. A subset of group processes were examined and future research could examine if other work group processes also mediate the effect of empowered workplaces on patient outcomes, and if so, determine the processes with the greatest impact on outcomes. There is a paucity of research on the work environment dynamics of other professional groups and this study model could be revised to examine work environments and outcomes of other healthcare professional groups. Additional research is needed on to understand work environments of nurses delivering care in other sectors such as community and home care.

As the body of evidence on work environments grows, a shift from descriptive correlational to intervention-based research is needed to determine the quantifiable effects

of specific empowerment-based strategies. Given the fiscal pressures faced by decision makers in the hospital sector, an economic analysis of the costs and outcomes of empowered workplaces could also provide further support and justification for expenditures to improve the workplace conditions for nurses.

Finally, some of the findings of this study suggest other promising avenues to explore in greater depth. A test of the extended patient empowerment model proposed by Laschinger, Gilbert, Smith & Leslie (2009) is warranted given that many of the proposed relationships within the new model were supported in the current study. The influence of staff mix on patient outcomes needs further examination to determine if other confounding variables such as type of unit, geographical location of hospital, type of unit, or other factors better explain the differences in patient outcomes observed in this study.

Summary

In conclusion, the findings of this study supported the proposition that creating empowering work environments for nurses may result in higher levels of quality care and fewer risks for patients while at the same time enhance nurses' job satisfaction. The presence of structurally empowerment factors not only influenced work effectiveness for individual nurses but also contributed to team functioning in terms of group processes. By analyzing these relationships at the group level, the contribution of contextual factors on these outcomes was elucidated. The presence of structural factors influenced individual nurse's feelings of empowerment and, in turn, their use of empowered behaviours. Theoretically, evidence was created to support the further evolution of structural empowerment theory to include group processes and empowered behaviour as mediators to various nurse and patient outcomes. The multilevel analysis has offered a more comprehensive view of work environments from an empowerment perspective. The

evidence from this study reinforces the critical need to invest in improving nursing work environments for the benefit of patients and nurses. Theory-informed strategies for changes to the workplace have the potential to mitigate projected nursing shortages and ensure a sustainable workforce to meet future demands for care.

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Appendix A

Research Ethics Approval and Re-approval

Office of Research Ethics
The University of Western Ontario
Room 00045 Dental Sciences Building, London, ON, Canada N6A 5C1
Telephone: (519) 661-3036 Fax: (519) 850-2466 Email: ethics@uwo.ca
Website: www.uwo.ca/research/ethics

Use of Human Subjects - Ethics Approval Notice

Principal Investigator: Dr. H.K.S. Laschinger
Review Number: 12544E **Revision Number:**
Protocol Title: Effects of Work Environments on Nursing and Patient Outcomes
Department and Institution: Nursing, University of Western Ontario
Sponsor:
Ethics Approval Date: August 14, 2006 **Expiry Date:** December 31, 2007
Documents Reviewed and Approved:
Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted expedited approval to the above named research study on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

This approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without prior written approval from the HSREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of monitor, telephone number). Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed information/consent documentation.

Investigators must promptly also report to the HSREB:
a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) all adverse and unexpected experiences or events that are both serious and unexpected;
c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this office for approval.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

Chair of HSREB: Dr. John W. McDonald
Deputy Chair: Susan Hoddinott

Ethics Officer to Contact for Further Information		
☒ Denise Grafton (dgrafton@uwo.ca)	☐ Janice Sutherland (jsuther@uwo.ca)	☐ Jennifer McEwen (jmcewen4@uwo.ca)

This is an official document. Please retain the original in your files.

cc: ORE File
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Faxed: Y / N

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Western

Use of Human Subjects - Ethics Approval Notice

Principal Investigator: Dr. H.K.S. Laschinger
Review Number: 12544E **Revision Number:** 2
Review Date: January 8, 2008 **Review Level:** Expedited
Protocol Title: Effects of Work Environments on Nursing and Patient Outcomes
Department and Institution: Nursing, University of Western Ontario
Sponsor:
Ethics Approval Date: January 8, 2008 **Expiry Date:** December 31, 2008
Documents Reviewed and Approved: Revised study end date.
Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced revision(s) or amendment(s) on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

The ethics approval for this study shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without prior written approval from the HSREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of monitor, telephone number). Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed information/consent documentation.

Investigators must promptly also report to the HSREB:

a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) all adverse and unexpected experiences or events that are both serious and unexpected;
c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this office for approval.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

Chair of HSREB: Dr. John W. McDonald

Ethics Officer to Contact for Further Information

☐ Janice Sutherland (jsuther@uwo.ca)	☐ Jennifer McEwen (jmcewen4@uwo.ca)	☑ Grace Kelly (grace.kelly@uwo.ca)	☐ Denise Grafton (dgrafton@uwo.ca)

This is an official document. Please retain the original in your files.

cc: ORE File
LHRI

Appendix B

Invitation to Participate

Western
Faculty of Health Sciences
School of Nursing

Effects of Work Environments on Nursing and Patient Outcomes

INVITATION TO PARTICIPATE FOR CHIEF NURSING EXECUTIVES

Date.

Dear

I am a doctoral student at the School of Nursing, University of Western Ontario and would like to invite your hospital to participate in a research study. The study is a component of my dissertation and will be overseen by Dr. Heather Laschinger who is my thesis advisor. Studies have shown that the current and projected nursing shortage is fuelled by job dissatisfaction arising from working conditions. As nursing manpower is reduced, the patient is at more risk for experiencing adverse events. Evidence linking nursing staffing patterns to patient outcomes has accumulated, but the impact of other latent workplace conditions on patient outcomes has only begun to be examined. The purpose of this study is to determine the relationship between nurses' perceptions of their work environment and the quality and risk outcomes for both the patient and the nurse. The results of this study have the potential to provide evidence that supports the investment in strategies that will create healthy work environments, sustain and build the nursing workforce and, in turn, achieve positive patient outcomes.

Nurses and discharged patients from selected medical-surgical units will be invited to participate in this study. Participation includes the completion of a survey that will take approximately 15-20 minutes. The nurses would be given a letter inviting them to participate through completion of an online web-based survey while patients would complete a written survey that is distributed to them prior to discharge. Additional details regarding the study are included in the attached executive summary. I will contact you by phone within the next week to discuss the study in more detail. I am also available to meet with you in person if preferred.

If you are interested in participating in this study, please complete the attached fax back sheet as soon as possible and return it to the fax number listed on the form. If you have any questions at this time, please contact me by email at xxxx, by pager xxxx or by voice mail xxxx. You may also contact my thesis advisor, Dr. Heather Laschinger at xxxx or by phone xxxx. Thank your for considering this request.

Sincerely,
Nancy Purdy, RN, PhD (c),
Voice mail xxxx
Pager xxxx

Attachments:

- Executive Summary of Study
- Summary of Study Activities, Roles and Responsibilities
- Fax-back Form
- UWO ethics approval

Executive Summary

The purpose of this study is to determine the relationship between nurses' perceptions of their work environment and the quality and risk outcomes for both the patient and the nurse. Data will be collected using standardized questionnaires completed by a sample of nurses and discharged patients affiliated with selected medical and surgical units from acute care community and teaching hospitals in Ontario. Chief Nursing Executives (CNE) will be contacted regarding their organization's interest in participating in the study. If there is agreement to proceed, the investigator will seek ethics approval from your organization. Once ethics approval has been obtained, a sample of patient care units will be selected. The CNE will provide the investigator with contact information for the patient care unit managers and the manager of quality and risk (names, work email addresses and phone numbers).

The data will be collected over a one-month period (approximately) at each hospital at a time negotiated with the patient care unit manager. The investigator and/or nurse manager will introduce the study to all nursing staff one week prior to the negotiated starting date. The researcher will provide the manager with posters and a standardized email message for staff to reinforce key messages regarding the study.

Managers will be requested to prepare a list of RNs and RPNs who meet the inclusion criteria. Based on the number of potential participants, the investigator will prepare individualized letters (by number only) that includes the study information, a user ID/password and a web address to access the online survey. This information will be shared with the investigator when onsite so that individualized letters can be prepared/distributed in person to the nurses. Nurses will be asked to complete the nursing survey in private at work or at home and will take approximately 15-20 minutes.

Patients will receive a package of information from their nurse on the day of discharge from hospital. This package will contain a questionnaire, letter of information and a pencil. Questionnaires will be coded to identify the hospital, unit and subject number only. Participants will complete the questionnaire (approximately 10 minutes in length) or leave it blank then seal it in the envelope provided. Patients will keep a copy of the letter of information for their personal records and the pencil as a token of appreciation. The nurse will collect the envelope and place it in a designated secure area (determined by the Nurse Manager). Fifty packages per unit will be made available and will be distributed to the first 50 patients to be discharged after the start date for the study. After all of the patient survey packages have been distributed and returned, the Nurse Manager will seal them in a single envelope or box (provided by the investigator) and will courier them to the investigator at the university address (cost of mailing paid by the investigator).

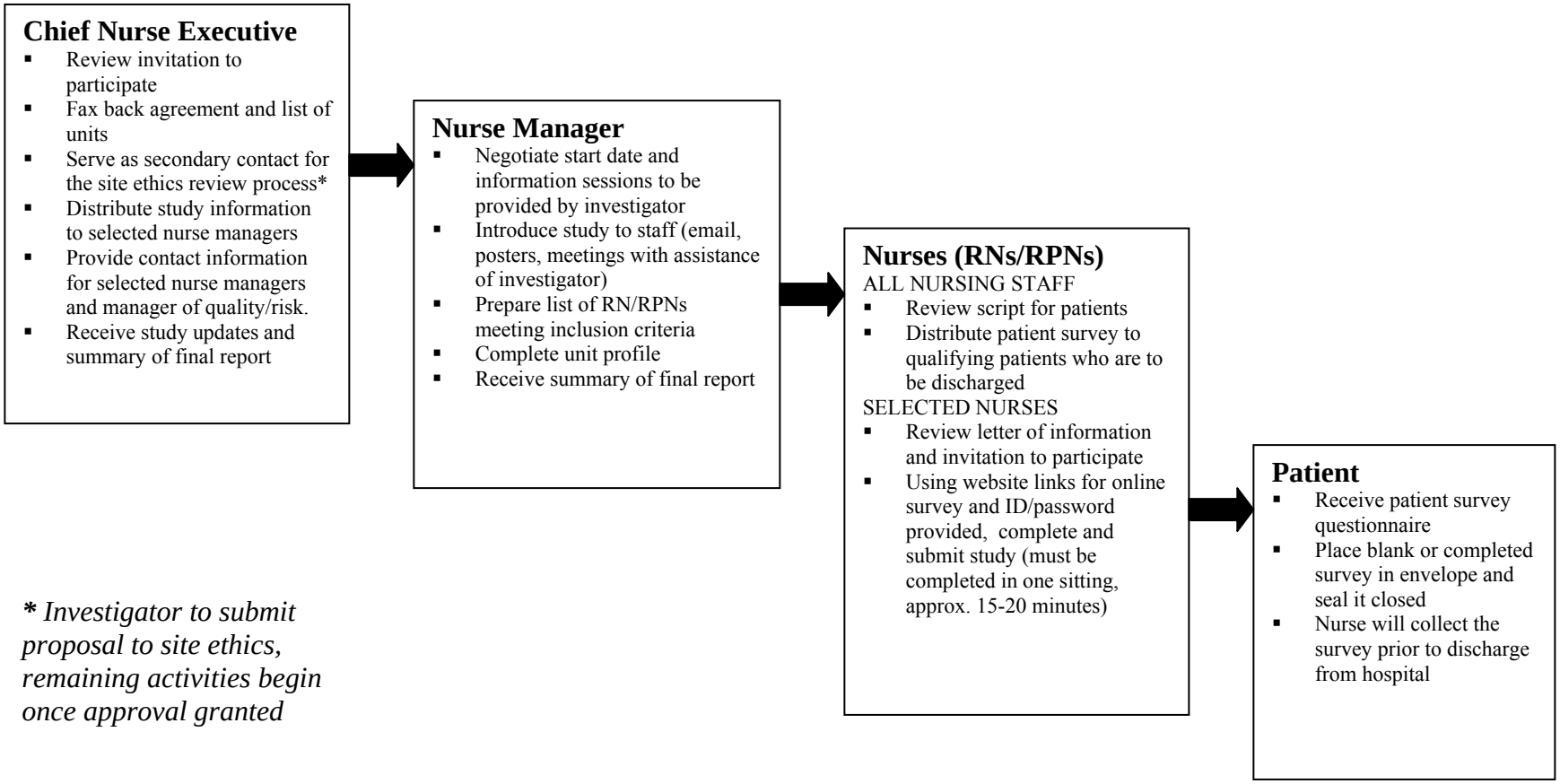
The manager will complete a brief unit profile describing the general characteristics of the unit based on data that is routinely collected/reported. The manager of quality/risk will also be requested to provide data regarding the number of patient falls and pressure ulcers for the most recent 12-month period for selected units based on existing records.

The Social Science Network and Data Services (SSNDS) at the University of Western Ontario has been contracted to manage the online nursing survey process. All data will be secured in a locked cabinet accessible only the researcher. Raw data will be destroyed after the required time frame and only grouped data will be reported. No names will appear on any of the electronic data files used by the researcher.

A summary of the activities, roles and responsibilities of the organization is found on the next page.

Summary of Study Activities, Roles and Responsibilities

Effects of Work Environments on Nursing and Patient Outcomes



** Investigator to submit proposal to site ethics, remaining activities begin once approval granted*

CNE FAX BACK and AGREEMENT FORM

TO: Attention - Nancy Purdy, RN, PhD (c)
FAX: xxxx **PHONE:** xxxx
RE: **Effects of Work Environments on Nursing and Patient Outcomes**

FROM: Name _____
Organization _____
Fax _____ Phone _____

Email address _____

MESSAGE:

☐ I do not agree to enrolling our organization in the study entitled "Effects of Work Environments on Nursing and Patient Outcomes" at this time. The total number of adult medical and/or surgical inpatient units in our hospital is _____ (excluding critical care and step-down units).

☐ I agree to enrolling our organization in the study entitled "Effects of Work Environments on Nursing and Patient Outcomes" pending ethics approval by our hospital. I have had an opportunity to discuss the study and have had questions answered to my satisfaction.

Signature_____ Title _____

Date _____

List of Names of Medical and/or Surgical Inpatient Units (Adult only)

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

To assist with internal marketing and communication of the study, I would like to use the following strategies:

☐ Intranet posting ☐ Hospital newsletter ☐ Email to nursing staff for general distribution

☐ Other -_____

The content for the marketing messages will be drafted by the investigator, negotiated with the CNE and approved by the University of Western Ontario and this organization's ethics committee

Western
Faculty of Health Sciences
School of Nursing

Effects of Work Environments on Nursing and Patient Outcomes

LETTER OF INFORMATION FOR MANAGERS OF QUALITY AND RISK

Date
Dear

I am a doctoral student at the School of Nursing, University of Western Ontario and I have recently implemented my research study " Effects of Work Environments on Nursing and Patient Outcomes" at Cambridge Memorial Hospital. The study is a component of my dissertation and it is being overseen by Dr. Heather Laschinger who is my thesis advisor. Studies have shown that the current and projected nursing shortage is fuelled by job dissatisfaction arising from working conditions. As nursing manpower is reduced, the patient is at more risk for experiencing adverse events. Evidence linking nursing staffing patterns to patient outcomes has accumulated, but the impact of other latent workplace conditions on patient outcomes has only begun to be examined. The purpose of this study is to determine the relationship between nurses' perceptions of their work environment and the quality and risk outcomes for both the patient and the nurse. The results of this study have the potential to provide evidence that supports the investment in strategies that will create healthy work environments, sustain and build the nursing workforce and, in turn, achieve positive patient outcomes.

Nurses and discharged patients form randomly selected medical-surgical units have been invited to participate in this study. The nurses would be given a letter inviting them to participate through completion of an online web-based or printed survey while patients would complete a printed survey that is distributed to them on the day of discharge. Additional details regarding the study are included in the attached executive summary.

I will be contacting you by phone and/or email within the next week to discuss the study in more detail and request selected unit-based data on the number of patient care falls and wounds that have been reported/recorded over the past year. I am requesting data that has already been collected by your organization and is found in existing hospital databases. I am not requesting any new data to be collected. I have attached a copy of the ethics approval from the University of Western Ontario (UWO) and from the organization's ethics committee that authorize the request for this information.

If you have any questions at this time, please contact me by email at xxxx, by phone xxxx or by pager xxxx. You may also contact my thesis advisor, Dr. Heather Laschinger at xxxx or xxxx. I look forward to speaking to you further about this data.

Sincerely,

Nancy Purdy, RN, PhD (c),

Attachments: Executive Summary of Study, Copy of Ethics Approvals (UWO, site ethics)

Western
Faculty of Health Sciences
School of Nursing

Effects of Work Environments on Nursing and Patient Outcomes

INVITATION TO PARTICIPATE FOR NURSE MANAGERS

Date
Dear

I am a doctoral student at the School of Nursing, University of Western Ontario and would like to invite your hospital to participate in a research study. The study is a component of my dissertation and will be overseen by Dr. Heather Laschinger who is my thesis advisor. Studies have shown that the current and projected nursing shortage is fuelled by job dissatisfaction arising from working conditions. As nursing manpower is reduced, the patient is at more risk for experiencing adverse events. Evidence linking nursing staffing patterns to patient outcomes has accumulated, but the impact of other latent workplace conditions on patient outcomes has only begun to be examined. The purpose of this study is to determine the relationship between nurses' perceptions of their work environment and the quality and risk outcomes for both the patient and the nurse. The results of this study have the potential to provide evidence that supports the investment in strategies that will create healthy work environments, sustain and build the nursing workforce and, in turn, achieve positive patient outcomes. The Chief Nursing Executive is in agreement with the study being implemented in this hospital pending approval of the ethics committee.

Nurses and discharged patients from medical-surgical units across Ontario will be invited to participate in this study and your unit (name of unit) has been randomly selected. The nurses would be given a letter inviting them to participate through completion of an online web-based survey while patients would complete a written survey that is distributed to them on the day of discharge. Additional details regarding the study are included in the attached executive summary. I will contact you by phone within the next week to discuss your role in the study in more detail.

I have attached a copy of the ethics approval from the University of Western Ontario (UWO) and from the organization's ethics committee that authorize the request for this information. If you have any questions at this time, please contact me by email at xxxx, by phone xxxx or by pager (to be arranged). You may also contact my thesis advisor, Dr. Heather Laschinger at xxxx or xxxx. Thank you in advance for your assistance with this research.

Sincerely,

Nancy Purdy, RN, PhD (c),

Attachments: Executive Summary of Study, Copy of Ethics Approvals (UWO, site ethics)

Appendix C

Recruitment Material for Nursing Staff

Email to Nursing Staff to Introduce Study

Effects of Work Environments on Nursing and Patient Outcomes

Beginning in the next week, nurses and patients on your unit will be participating in a study examining
the relationship between nurses' views of their work environment and the outcomes for both the patient and the nurse. This study is being conducted at various hospitals across Ontario by Nancy Purdy, RN, PhD (c) who is a doctoral student at the University of Western Ontario.

Your support and perspectives are critical to the success of this study and to the quality of the evidence used to inform changes directed to enhancing nursing work environments.

HIGHLIGHTS

Start Date: to be arranged Completion Date: to be arranged (approximately one month)

FOR ALL NURSES – You will be asked to distribute patient survey packages to the first 50 patients to be discharged from the unit. A brief script has been prepared to help you introduce the study to the patient.

FOR SELECTED NURSES – RNs and RPNs who have worked on this unit for at least one year (full time or part time capacity) will provided a letter of information, an individualized user ID/password and a web address to access an online survey. The survey will take 15-20 minutes and can be completed in private either at work or home. All results are received by the staff at the Social Sciences Network & Data Centre at the University of Western Ontario who have been contracted to manage the survey. No names or contact information will be given to the investigator who will analyze the data. In recognition of your support, you will have a 1/500 chance to win a cheque for $100 . Further details will be provided in a letter of information and an informal information session given by the investigator.

This study has been approved by the ethics committee of your hospital. If questions, please contact Nancy Purdy at xxxx or visit her website at xxxx (under construction).

Email - Week 1 Reminder

TO: RNs and RPNs (sent to the Nurse Manager forwarded as general distribution to unit nurses)

FROM: Nancy Purdy, RN, PhD (c), Principal Investigator

SUBJECT: Nursing Research Study - Work Environments and Outcomes - Reminder Week 1

(Date)

Within the last week, nurses were selected to participate in a research study examining work environments and their relationships to nursing and patient outcomes. Your experiences and perspectives are critical to the development of strategies and policies that can improve both the workplace for nurses as well as the quality of care delivered.

Participation in the study involves completing an online survey that should take no more than 15-20 minutes to complete. If you agree to participate, please visit the website listed below and enter the user ID and password provided. Please contact your nurse manager if you have misplaced this information.

Study website: (tba)

The survey needs to be completed at one time and you will not be able to return to the questionnaire at a later date.

Thank you for your support,

Nancy Purdy, RN, PhD (c)
PhD Student, School of Nursing
University of Western Ontario

Email - Week 3 Reminder

TO: RNs and RPNs (sent to the Nurse Manager and forwarded as general distribution to unit nurses)

FROM: Nancy Purdy, RN, PhD (c), Principal Investigator

SUBJECT: Nursing Research Study - Work Environments and Outcomes - Second Reminder

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Your schedule is likely very busy and you may not have had an opportunity to complete the nursing survey. Your views on your nursing work environment and the quality of care delivered are very important. Every nurse's survey is critical to the success of this study, and more importantly, to building quality evidence that can be used to influence decision makers to improve the workplace for nurses as well as the patients who receive nursing services.

Participation in the study involves completing an online survey that should take no more than 15-20 minutes to complete. If you agree to participate, please visit the website listed below and enter the user ID and password provided. Please contact your nurse manager if you have misplaced this information.

Study website: (tba)

The survey needs to be completed at one time and you will not be able to return to the questionnaire at a later date.

Thank you for your support,

Nancy Purdy, RN, PhD (c)
PhD Student, School of Nursing
University of Western Ontario

Email - Week 4 Reminder

TO: RNs and RPNs (sent to the Nurse Manager and forwarded as general distribution to unit nurses)

FROM: Nancy Purdy, RN, PhD (c), Principal Investigator

SUBJECT: Final Reminder -Nursing Research Study - Work Environments and Outcomes

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The study period is almost over and I would like to offer one final reminder to encourage you to complete the nursing survey that is available online. The research study is examining work environments and their relationships to nursing and patient outcomes. Your experiences and perspectives are critical to the success of the study. The collective views of all nurses across Ontario will be summarized, analysed and shared (as group data) with key decision makers within hospitals, professional organizations and government.

Participation in the study involves completing an online survey that should take no more than 15-20 minutes to complete. If you agree to participate, please visit the website listed below and enter the user ID and password provided. Please contact your nurse manager if you have misplaced this information.

Study website: (tba)

The survey needs to be completed at one time and you will not be able to return to the questionnaire at a later date. As a token of appreciation for your efforts, your name will be entered into a lottery for a $100 cheque (10 prizes, odds of winning are approximately 1 in 500).

> *NOTE – The survey will remain active until (2 months, enter date) after which time you will not be able to access this survey.*

Thank you for considering this request,

Nancy Purdy, RN, PhD (c)
PhD Student, School of Nursing
University of Western Ontario

Appendix D

Study Worksheets

Western
Faculty of Health Sciences
School of Nursing

Effects of Work Environments on Nursing and Patient Outcomes

Study Worksheet - Manager

Please complete the following chart by including the names of Registered Nurses and Registered Practical Nurses employed as staff nurses on your unit who meet the following inclusion criteria:

- employed on the unit for a minimum of 1 year
- employed Full Time or Part Time (including Job Sharing positions, excluding nurses currently on MLOA or LTD)

Number	Name	Number	Name
1.		21.	
2.		22.	
3.		23.	
4.		24.	
5.		25.	
6.		26.	
7.		27.	
8.		28.	
9.		29.	
10.		30.	
11.		31.	
12.		32.	
13.		33.	
14.		34.	
15.		35.	
16.		36.	
17.		37.	
18.		38.	
19.		39.	
20.		40.	

Complete more than one page if needed.

The investigator will ask for this information in person on the day the study is introduced to staff. An individualized letter inviting the nurses to participate in the study will be prepared for each name on this list. Each letter will contain a number on the envelope to correspond to each of the nurses listed above. This list will be returned to you and no copies will be retained by the investigator. The list should be discarded in confidential garbage upon completion of the study for your unit.

Investigator – Nancy Purdy

Faculty of Health Sciences
School of Nursing

Effects of Work Environments on Nursing and Patient Outcomes

Study Worksheet - Investigator

Registered Nurses and Registered Practical Nurses employed as staff nurses who meet the following inclusion criteria:

- employed on the unit for a minimum of 1 year
- employed Full Time or Part Time (including Job Sharing positions, excluding nurses currently on MLOA or LTD)

Hospital _____(Code)_____Unit Name _____ _____(Code)_____

Manager Name_____Number of Nurses meeting inclusion criteria ____

Number	User ID	Password	Number	User ID	Password
1.			21.		
2.			22.		
3.			23.		
4.			24.		
5.			25.		
6.			26.		
7.			27.		
8.			28.		
9.			29.		
10.			30.		
11.			31.		
12.			32.		
13.			33.		
14.			34.		
15.			35.		
16.			36.		
17.			37.		
18.			38.		
19.			39.		
20.			40.		

Complete more than one page if needed.

Appendix E

Data Collection Tools

Western

Faculty of Health Sciences
School of Nursing

Effects of Work Environments on Nursing and Patient Outcomes

Nancy Purdy, RN, PhD(c)
School of Nursing,
The University of Western Ontario

Heather Laschinger, RN, PhD
School of Nursing,
The University of Western Ontario

NURSING SURVEY

The study is intended to examine the relationship between nursing work environments and outcomes experienced by nurses and patients. Your experiences and perspectives are critical to the development of strategies and policies that can improve both the workplace for nurses as well as the quality of care delivered. Registered Nurses and Registered Practical Nurses who have worked on selected medical and/or surgical units across Ontario are invited to participate if they have been employed on the unit for a minimum of 1 year either full time, part time or in a job sharing position and are not currently on maternity leave or long term leave due to illness.

CONFIDENTIALITY

By completing this survey, you are agreeing to participate in this research, have read the letter of information provided by the investigator and have had your questions answered to your satisfaction. Any information collected through this survey will be kept strictly confidential. The information will be coded using an identification number and stored in a password protected or locked location. Furthermore, your name will not appear in any report, oral presentation, or publication for this study.

INSTRUCTIONS

The survey should take no more than 15-20 minutes to complete. There are 2 ways that you can complete the survey. Select the one method that is most convenient.

OPTION 1: ONLINE SURVEY – The survey can be accessed at the following web address –(TBA). Please enter the following user ID and password:

USER ID _____ PASSWORD _____

The survey needs to be completed at one time and you will not be able to return to the questionnaire at a later date (answers are not saved until the survey is submitted).

OPTION 2: PAPER SURVEY – Please complete the survey questions starting on the next page. Place the survey in the self-addressed stamped envelope provided and place it in the mail.

Circle the appropriate response for each item. If you do not want to answer a specific question, simply leave it blank and move on to the next question.

SECTION 1 of 10

To what extent is each of the following present in your current job?

		None		Some		A Lot
1.	Opportunity for challenging work.	1	2	3	4	5
2.	The chance to gain new skills and knowledge on the job.	1	2	3	4	5
3.	Tasks that use all of your own skills and knowledge.	1	2	3	4	5
4.	Information about the current state of the hospital.	1	2	3	4	5
5.	Information regarding the values of top management.	1	2	3	4	5
6.	Information regarding the goals of top management.	1	2	3	4	5
7.	Specific information about things you do well.	1	2	3	4	5
8.	Specific comments about things you could improve.	1	2	3	4	5
9.	Helpful hints or problem solving advice.	1	2	3	4	5
10.	Time available to do necessary paperwork.	1	2	3	4	5
11.	Time available to accomplish job requirements.	1	2	3	4	5
12.	Acquiring temporary help when needed.	1	2	3	4	5
13.	Rewards for innovation on the job.	1	2	3	4	5

14.	Amount of flexibility in my job.	1	2	3	4	5
15.	Amount of visibility of my work related activities within the hospital.	1	2	3	4	5
16.	Collaboration with physicians.	1	2	3	4	5
17.	Being sought out by peers for help with problems.	1	2	3	4	5
18.	Being sought out by administration for help with problems.	1	2	3	4	5
19.	Collaborating with other health care professionals (e.g. Physiotherapists, Occupational Therapists, Dieticians).	1	2	3	4	5

Section 2 of 10

Please indicate the extent to which you agree or disagree with each statement.

		Strongly Disagree				Strongly Agree
1.	The work I do is very important to me.	1	2	3	4	5
2.	My job activities are personally meaningful to me.	1	2	3	4	5
3.	The work I do is meaningful to me.	1	2	3	4	5
4.	I am confident about my ability to do my job.	1	2	3	4	5
5.	I am self-assured about my capabilities to perform my work activities.	1	2	3	4	5
6.	I have mastered the skills necessary for my job.	1	2	3	4	5
7.	I have significant autonomy in determining how I do my job.	1	2	3	4	5
8.	I can decide on my own how to go about doing my work.	1	2	3	4	5
9.	I have considerable opportunity for independence and freedom in how I do my job.	1	2	3	4	5
10.	My impact on what happens in my unit/program is large.	1	2	3	4	5
11.	I have a great deal of control over what happens in my unit/program.	1	2	3	4	5
12.	I have significant influence over what happens my unit/program.	1	2	3	4	5

Section 3 of 10

This questionnaire consists of statements about your team, and how your team functions as a group. Please indicate the extent to which each statement describes your team.

		Strongly Disagree			Neither Agree nor Disagree			Strongly Agree
1.	I cannot accomplish my tasks without information or materials from other members of my team.	1	2	3	4	5	6	7
2.	Other members of my team depend on me for information or materials to perform their tasks.	1	2	3	4	5	6	7
3.	Within my team, jobs performed by team members are related to one another.	1	2	3	4	5	6	7
4.	Members of my team have great confidence that the team can perform effectively.	1	2	3	4	5	6	7
5.	My team can take on nearly any task and complete it.	1	2	3	4	5	6	7
6.	My team has a lot of team spirit.	1	2	3	4	5	6	7
7.	Being in my team gives me the opportunity to work in a team and provide support to other team members.	1	2	3	4	5	6	7
8.	My team increases my opportunities for positive social interaction.	1	2	3	4	5	6	7
9.	Members of my team help each other out when needed.	1	2	3	4	5	6	7
10.	Everyone on my team does their fair share of the work.	1	2	3	4	5	6	7
11.	No one in my team depends on other team members to do the work for them.	1	2	3	4	5	6	7
12.	Nearly all the members on my team contribute equally to the work.	1	2	3	4	5	6	7

13.	Members of my team are very willing to share information with other team members about our work .	1	2	3	4	5	6	7
14.	Teams enhance the communication among people working on the same tasks.	1	2	3	4	5	6	7
15.	Members of my team cooperate to get the work done.	1	2	3	4	5	6	7

Section 4 of 10

Please rate the frequency with which you engage in the following behaviours.

		Never										Always
1.	Work in a group to solve work problems.	0	1	2	3	4	5	6	7	8	9	10
2.	Identify work problems that need to be improved.	0	1	2	3	4	5	6	7	8	9	10
3.	Use analytic skills to collect data about work problems and recommend solutions.	0	1	2	3	4	5	6	7	8	9	10
4.	Learn new skills related to my current job.	0	1	2	3	4	5	6	7	8	9	10
5.	Use mathematical/statistical skills on the job.	0	1	2	3	4	5	6	7	8	9	10
6.	Help people from different departments determine the root cause of problems within the hospital.	0	1	2	3	4	5	6	7	8	9	10
7.	Work with other hospital employees outside of my own work group to solve work problems.	0	1	2	3	4	5	6	7	8	9	10
8.	Make a difference to the effectiveness of the hospital that I work in.	0	1	2	3	4	5	6	7	8	9	10
9.	Help my co-workers make improvements at work.	0	1	2	3	4	5	6	7	8	9	10
10.	Help my manager make improvements at work.	0	1	2	3	4	5	6	7	8	9	10
11.	Bring about changes in the way I do my work in this hospital.	0	1	2	3	4	5	6	7	8	9	10

	Never										Always
12. Bring about improvements in the way work is done in the hospital.	0	1	2	3	4	5	6	7	8	9	10
13. State my opinion in group meetings.	0	1	2	3	4	5	6	7	8	9	10
14. State my opinion about work problems to my manager.	0	1	2	3	4	5	6	7	8	9	10
15. State my opinion about work problems to managers who are outside my own department.	0	1	2	3	4	5	6	7	8	9	10
16. Handle a more challenging job.	0	1	2	3	4	5	6	7	8	9	10
17. Prepare written reports about work problems.	0	1	2	3	4	5	6	7	8	9	10
18. Work with co-workers in a group.	0	1	2	3	4	5	6	7	8	9	10
19. Debate my point of view in a group setting.	0	1	2	3	4	5	6	7	8	9	10
20. Debate my point of view with co-workers.	0	1	2	3	4	5	6	7	8	9	10
21. Participate in decisions concerning my work.	0	1	2	3	4	5	6	7	8	9	10

Section 5 of 10 - Please circle your responses to each question.

1. In general, how would you describe the quality of nursing care delivered to patients on your unit?

   Excellent Good Fair Poor

2. How would you describe the quality of nursing care delivered on your last shift?

   Excellent Good Fair Poor

3. Overall, over the past year would you say the quality of patient care on your unit has:

   Improved Remained the same Deteriorated

4. How confident are you that patients from your unit are able to manage their care when discharged from the hospital?

   Very Confident Confident Somewhat Confident Not at all Confident

Section 6 of 10

Over the past year, how often would you say each of the following incidents has occurred involving you or your patients.

		Never	Rarely	Occasionally	Frequently
1.	Patient received wrong medication or dose.	1	2	3	4
2.	Nosocomial infections.	1	2	3	4
3.	Patient falls with injuries.	1	2	3	4
4.	Complaints from patients or families.	1	2	3	4

Section 7 of 10

Please indicate the extent to which you agree or disagree with each statement.

		Strongly Disagree				Strongly Agree
1.	I feel very satisfied with my job.	1	2	3	4	5
2.	I feel that my coworkers are satisfied with their jobs.	1	2	3	4	5
3.	I feel that I would be happy to work here until I retire.	1	2	3	4	5
4.	I feel that the health care facility provides a supportive work environment in which to work.	1	2	3	4	5

Section 8 of 10

For each item, please indicate the extent to which you agree that the item is PRESENT IN YOUR CURRENT JOB. Indicate your degree of agreement by circling the appropriate number.

		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	Adequate support services allow me to spend time with my patients.	1	2	3	4
2.	Enough time and opportunity to discuss patient care problems with other nurses.	1	2	3	4
3.	Enough registered nurses to provide quality patient care.	1	2	3	4
4.	Enough staff to get the work done	1	2	3	4

Section 9 of 10

Please indicate the extent to which you agree or disagree with each statement.

		Strongly Disagree				Strongly Agree
1.	Overall, I consider my workplace to be an empowering environment.	1	2	3	4	5
2.	Overall, my current work environment empowers me to accomplish my work in an effective manner.	1	2	3	4	5

Section 10

Demographic information - Please tell us something about yourself.

1. ☐ RN
   ☐ RPN

2. Employment status on this unit:

   ☐ Full time
   ☐ Part time (including job sharing)
   ☐ Casual

3. Years in current role: _____ years

4. Years in nursing: _____years

5. Gender:

   ☐ Male
   ☐ Female

6. Age in years: _____ years

7. Highest level of education:

   ☐ College diploma Attended program in Canada: ☐ yes ☐ no
   ☐ BScN Attended program in Canada: ☐ yes ☐ no
   ☐ MScN Attended program in Canada: ☐ yes ☐ no
   ☐ Other: _____Attended program in Canada: ☐ yes ☐ no

Are there any further comments you would like to share with us?

Thank you very much for taking time to participate in this study.

For details about the prize draw and certificate of participation, please see next page.

☐ Please enter my name into the draw for one of ten $100 prizes. If I am selected for the prize, I can be notified at the following personal email address:

_____

☐ Please send a **Certificate of Participation** (in pdf format) to the following personal email address:

_____

(Your contact information will be destroyed once the certificate has been emailed.)

Version Dec 15/06

Effects of Work Environments on Nursing and Patient Outcomes

UNIT PROFILE

TO: Nurse Managers of Selected Units

Please complete the following questions to provide background information about your unit that will be used to understand the differences and similarities between patient care units involved in the study. Only a code number that identifies the hospital and unit will be used for the data file and any identifiers that associate your answers to your unit will be destroyed upon completion of the study. This document will likewise be destroyed and placed in confidential waste after the study has been completed. Grouped data will be reported at a hospital level for nursing responses. Patient data on quality and risk outcomes will be reported at a unit level to assist with your quality management activities. Questions can be left blank if you prefer but complete data is always more helpful in the analysis.

Questions *NOTE: responses based on last 12 months*	Answers	Data not available	Prefer not to answer
Hospital Name			
Unit Name			
Unit Characteristics			
No. of beds			
Average no. of patient discharges per month			
Best Practice Guidelines for falls have been implemented	No † Yes † If yes, how long have they been in place		
Best Practice Guidelines for wounds have been implemented	No † Yes † If yes, how long have they been in place		
Manager Characteristics			
No. of years in current role			

Nurse Staffing Characteristics			
Nurse-to-patient ratio Average number of patients assigned to each nurse	Days Evenings Nights		
Staffing -as reported in Nursing MIS guidelines e.g. unit producing personnel (UPP) worked hours for regulated staff	Nursing hours per patient day (HPPD)		
Staff mix/ Proportions of RNs	No. FTEs RN ▪ Full Time ▪ Part Time/job share ▪ Casual ▪ TOTAL No. FTEs RPN ▪ Full Time ▪ Part Time/job share ▪ TOTAL No. FTEs Unregulated clinical workers (e.g. PSWs) ▪ Full Time ▪ Part Time/job share ▪ Casual TOTAL		
Please identify any major changes that have occurred on the unit over the past year that may impact nursing care delivery (e.g. implementation of electronic documentation. etc.) or the quality of patient care.			

Thank you for your efforts to support the implementation of this study!

Please email, fax or mail the completed Unit Profile to Nancy Purdy:

Email xxxx
Fax xxxx

Phone xxxx
Pager (to be arranged)

Mail University of Western Ontario, School of Nursing
London, Ontario

Faculty of Health Sciences
School of Nursing

Effects of Work Environments on Nursing and Patient Outcomes

Nancy Purdy, RN, PhD(c)
School of Nursing,
The University of Western Ontario

Heather Laschinger, RN, PhD
School of Nursing,
The University of Western Ontario

PATIENT SURVEY

For office use: ID

The study is intended to examine the relationship between nursing work environments and outcomes experienced by nurses and patients.

CONFIDENTIALITY

By completing this survey, you are agreeing to participate in this research, have read the letter of information provided by the investigator and have had your questions answered to your satisfaction. Any information collected through this survey will be kept strictly confidential. The information will be coded using an identification number and stored in a password protected location. Furthermore, your name will not appear in any report, oral presentation, or publication for this study.

INSTRUCTIONS

The survey should take no more than 10-15 minutes to complete. A pencil has been included in this package for your convenience and is yours to keep. The questions start on the next page.

Place the completed or blank survey (if you decide not to participate) in the envelope provided and seal it so that your answers are private. Give this envelope to the nurse who will put it in a secure place until all surveys from this unit are collected and mailed to the researcher.

Thank you for being an important part of this study!

Part 1: Please answer the questionnaire for this admission to hospital. Answer the questions by circling the number beside each statement.

	Excellent	Very Good	Good	Fair	Poor
1. Information you were given: How clear and complete the nurses' explanations were about tests, treatments, and what to expect.	1	2	3	4	5
2. Instructions: How well nurses explained the preparation for tests and operations.	1	2	3	4	5
3. Ease of getting information: Willingness of nurses to answer your questions.	1	2	3	4	5
4. Information given by nurses: How well nurses communicated with patients, families, and doctors.	1	2	3	4	5
5. Informing family or friends: How well the nurses kept them informed about your condition and needs.	1	2	3	4	5
6. Involving family or friends in your care: How much were they allowed to help in your care.	1	2	3	4	5
7. Concern and caring by nurses: Courtesy and respect you were given; friendliness and kindness.	1	2	3	4	5
8. Attention of nurses to your condition: How often nurses checked on you and how well they kept track of how you were doing.	1	2	3	4	5

	Excellent	Very Good	Good	Fair	Poor
9. Recognition of your opinions: How much nurses ask you what you think is important and give you choices.	1	2	3	4	5
10. Consideration of your needs: Willingness of the nurses to be flexible in meeting your needs.	1	2	3	4	5
11. The daily routine of the nurses: How well they adjusted their schedules to your needs.	1	2	3	4	5
12. Helpfulness: Ability of the nurses to make you comfortable and reassure you.	1	2	3	4	5
13. Nursing staff response to your calls: How quick they were able to help.	1	2	3	4	5
14. Skill and competence of nurses: How well things were done, like giving medicine and handling IVs.	1	2	3	4	5
15. Coordination of care: The teamwork between nurses and other hospital staff who took care of you.	1	2	3	4	5
16. Restful atmosphere provided by nurses: Amount of peace and quiet.	1	2	3	4	5
17. Privacy: Provisions for your privacy by nurses.	1	2	3	4	5
18. Discharge instructions: How clearly and completely the nurses told you what to do and what to expect when you leave the hospital.	1	2	3	4	5

	Excellent	Very Good	Good	Fair	Poor
19. Coordination of care after discharge: Nurses' efforts to provide for your needs after you leave the hospital.	1	2	3	4	5
20. Overall perceptions: Overall quality of care and services received during your hospital stay.	1	2	3	4	5
21. Overall quality of nursing care received during your hospital stay.	1	2	3	4	5
22. In general, would you say your health is:	1	2	3	4	5
	Strongly Agree	Somewhat Agree	Agree	Somewhat Disagree	Strongly Disagree
23. Based on the nursing care I received, I would recommend this hospital to my family and friends.	1	2	3	4	5

Part 2: Each of the following questions is about an aspect of your care related to your present health condition. Indicate how much you are able to do each care related activity by circling the number between "0" and "5" that is most appropriate.

	Care Activity	Not at all					Very Much So
1.	Do you know what medication you have to take?	0	1	2	3	4	5
2.	Do you understand the purpose of the medications prescribed to you (that is, do you know what the medications do for your health condition)?	0	1	2	3	4	5
3.	Are you able to take the medications as prescribed?	0	1	2	3	4	5
4.	Can you recognize changes in your body (symptoms) that are related to your illness or health condition?	0	1	2	3	4	5
5.	Do you understand why you experience some changes in your body (symptoms) related to your illness or health condition?	0	1	2	3	4	5
6.	Do you know and understand what to do (things or activities) to control these changes in your body (symptoms)?	0	1	2	3	4	5
7.	Are you able to carry out the treatments or activities that you have been taught to manage these changes in your body (symptoms)?	0	1	2	3	4	5
8.	Are you able to do things or activities to look after yourself and to maintain your health in general?	0	1	2	3	4	5

Care Activity	Not at all					Very Much So
9. Do you know whom to contact to get help in carrying out your daily activities?	0	1	2	3	4	5
10. Do you know whom to contact in case of a medical emergency?	0	1	2	3	4	5
11. Are you able to perform your regular activities (such as bathing, shopping, preparing meals, visiting with friends)?	0	1	2	3	4	5
12. Are you able to adjust your regular activities when you experience body changes (symptoms) related to your illness or health condition?	0	1	2	3	4	5

Part 3:

Overall, how would you rate your health before this most recent hospital stay? (check one)

☐ Excellent ☐ Good ☐ Fair ☐ Poor ☐ Very Poor ☐ Unsure

How many days were you in the hospital? _____days

Gender: ☐ Male ☐ Female

Age: _____years

Marital Status: ☐ Single
☐ Married/Cohabitating
☐ Separated/Divorced
☐ Widowed

Please check here if someone other than the patient completed this survey:
☐ Yes ☐ No

Thank you for taking time to complete this survey.

Appendix F

Draw Entry Form for Patients

Effects of Work Environments on Nursing and Patient Outcomes

Draw Entry Form for Patients

I have read the letter of information for this study and agree to have my name entered into a draw for a prize of a $100 cheque.

Name: _____

Signature: _____

Address: Apt. No./Street _____ Town/City _____

Province _____ Postal Code _____

Date: _____

All forms will be discarded in confidential waste after completion of the research study and prize draw. You will only be contacted by mail if you are a prize winner.

Appendix G

Script for Nurses to Introduce Study to Patients Prior to Discharge

Effects of Work Environments on Nursing and Patient Outcomes

Please distribute a patient survey package to any patient who meets the following criteria:

- adult (>18 years of age)
- orders in place for discharge to home
- to be discharged within the next 24 hours
- 50% of their hospital stay was on this unit
- minimum length of stay on this unit of 2 days
- able to read and understand English (may be assisted by a family member if available)

The following is a script that can be used to introduce the study to the patient as you provide them with the patient survey package. Feel free to use any part of this script but it does not need to be followed exactly.

"Our unit is participating in a research study being conducted by the School of Nursing at the University of Western Ontario. Nurses and patients are being asked to complete a short questionnaire to share our views on our workplace and the nursing care that is delivered.

We are handing out this survey to a limited number of patients and would like to encourage you to take time now to read the information and decide whether or not you would like to participate. The questions ask about your satisfaction with your nursing care and also how prepared you are to manage after being discharged from hospital. Nurses and patients from across the province are participating in this study.

Answering the survey is voluntary. Your individual answers are confidential and will be seen only by the researcher. It should take about 10 minutes to complete and there is a pencil in this envelope for you to use and keep.

I will leave this with you to complete before you leave today. Regardless if you complete it or not, please place the questionnaire in the envelope and seal it. I will come by before you leave to pick it up. I will place it at the desk in a secure location before sending it back to the researcher. You will not receive any further mail about this study; this is the only time it will be offered to you.

To recognize your assistance with the study, your name can be entered into a contest to win $100. The odds of winning are 1 in 500.

Thanks, in advance, for considering participation in this study."

Appendix H

Letters of Information

Effects of Work Environments on Nursing and Patient Outcomes

Western
Faculty of Health Sciences
School of Nursing

Letter of Information for Patients

Date

Dear Sir or Madam,

I am a doctoral student at the School of Nursing, University of Western Ontario and would like to invite you to participate in a research study. The study is a component of my dissertation and will be overseen by Dr. Heather Laschinger who is my thesis advisor.

The purpose of this study is to determine the relationship between nurses' views of their work environment and the quality of care provided as evaluated by both the patient and the nurse. People who have been in hospital on a medical and surgical unit in selected hospitals across Ontario will be participating in this study (approximately 11,000 patients).

Participation includes completing the enclosed survey that will take approximately 10 minutes. A pencil is enclosed for your convenience and you may keep it regardless of whether or not you choose to complete the survey. Your consent to participate in this research is assumed if you complete the survey. Completed surveys will be picked up by your nurse before you leave today. The Nurse Manager will collect all of the sealed envelopes and will mail them by courier to me at the university.

Participation in the study is voluntary and your care will not be affected by whether or not you choose to complete the survey. You can leave some questions unanswered. There are no known risks to your participation and you will not benefit directly from your participation. The questionnaires are coded to help identify the unit and the hospital but no other personal information will be requested. You can withdraw from the study at any time by leaving questions blank. After the survey has been returned to the nurse, your survey cannot be removed as there are no identifiers linking you to a specific survey. All information will be securely stored in a locked office at the university and destroyed at the completion of the study. All reports of this research will include information that is presented as a group to keep your specific answers confidential.

In appreciation for the time you have taken to participate in this study, your name will be entered into a lottery for a $100 (odds of winning are approximately 1 in 500). A separate form is enclosed asking if you agree to having your name entered into the draw. The staff person from the university will store these forms until the prize draw and then the forms will be destroyed. Prize winners will be sent a cheque by mail.

If you have any questions about the implementation of this study or your rights as a research subject, you may contact the Director, Office of Research Ethics, The University of Western Ontario, xxxx or email xxxx . If you have any further questions about this study, please contact me anytime at the email address, telephone number or pager number provided below. You may also contact my thesis advisor, Dr. Heather Laschinger at xxxx or xxxx. Please keep this letter for your future reference. Thank your for considering this request.

Sincerely,
Nancy Purdy, RN, PhD (c),

Western
Faculty of Health Sciences
School of Nursing

Effects of Work Environments on Nursing and Patient Outcomes

Letter of Information for Nurses and Invitation to Participate

Date

Dear Nursing Colleague,

I am a doctoral student at the School of Nursing, University of Western Ontario and would like to invite you to participate in a research study. The study is a component of my dissertation and will be overseen by Dr. Heather Laschinger who is my thesis advisor.

The purpose of this study is to determine the relationship between nurses' views of their work environment and the quality and risk outcomes for both the patient and the nurse. Registered Nurses and Registered Practical Nurses employed in direct care roles from selected medical-surgical units across Ontario are invited to participate in this study (approximately 5,600 nurses).

You are invited to take part in this study. There are 2 ways that you can complete the survey if you agree to participate. Select the one method that is most convenient.

OPTION 1: ONLINE SURVEY – The survey can be accessed at the following web address – survey.uwo.ca/patientoutcomes. The survey needs to be completed at one time and you will not be able to return to the questionnaire to complete it at a later date (answers are not saved until the survey is submitted). Your personal ID and password are found on page 2 of the enclosed survey booklet.

OPTION 2: PAPER SURVEY – Please complete the enclosed survey booklet. Place the survey in the self-addressed stamped envelope provided and place it in the mail.

Social Science Network & Data Services (SSNDS) at the University of Western Ontario has been contracted to manage the online survey. Once you have completed the online survey, the SSNDS staff person assigned to this study will forward only raw data files from completed surveys to the investigator. The data files will only contain an identification number that denotes the hospital, unit and a participant number (no other personal identifiers are accessible by the researcher, no individual data is accessible to hospital staff). Data is maintained by the SSNDS staff on a secure server.

Participation in the study is voluntary and your job will not be affected whether or not you choose to complete the surveys. You can leave some questions unanswered. You can withdraw from the study at any time by closing the website prior to submitting your survey. After this time, your survey cannot be deleted as there are no identifiers linking you to a specific survey. There are no known risks to your participation and you will not benefit directly from your participation. No information that can link your name and your responses will be made available to myself and only grouped data will be reported. All information will be securely stored in computer files and a locked

office at the university that can only be accessed by the investigator. A unit profile of the results will be made available to the Nurse Manager and Chief Nursing Officer for planning purposes if there is a minimum of 10 nurses on your unit participating in the study (to further assure anonymity of individual responses). An executive summary of the overall research results will be available on my personal website (xxxx). Please keep this letter of information for your reference.

In appreciation for the time you have taken to participate in this study, your name will be entered into a draw for a $100 cheque (10 prizes awarded in total, odds of winning approximately 1 in 500). At the end of the survey, you will be asked if you agree to entering into the draw, and if so, will be asked for your personal email address. The staff person form SSNDS will randomly choose the winner from the list of participants and you will be notified by email if you were selected for the prize. Your name and address will be required at this time in order to mail the prize but records of this personal information will be destroyed after the prizes have been distributed. A certificate of participation is also available online if requested. The certificate can be added to your College of Nurses of Ontario professional portfolio as evidence of your participation in and support of nursing research.

If you have any questions about the implementation of this study or your rights as a research subject, you may contact the Director, Office of Research Ethics, The University of Western Ontario, xxxx or email xxxx . If you have any further questions about this study, please contact me anytime at the email address, telephone number or pager number provided below. You may also contact my thesis advisor, Dr. Heather Laschinger at xxxx or xxxx.

Thank your for considering this request. Your perspectives are important to understanding the current nursing workplace and will help provide evidence to assist with positive changes in the future.

Sincerely,

Nancy Purdy, RN, PhD (c),

Appendix I

Copyright Release – Therapeutic Self Care – Acute Care

University of Toronto

University of Toronto

SUBJECT: Invoice
INVOICE #: UOT5634976
ORDER DATE: 2 December 2005

Billing Information
Nancy Purdy

Order Details

Project:	Therapeutic Self-Care Tool
Product:	Therapeutic Self-Care Tool (Home Care Settings) for Researchers (Home Survey.pdf)
Quantity:	1
Tax calculated for Ontario	
Net Amount:	$10.50
GST Amount:	$0.74
Total Amount:	$11.24 CAD

If paying by Cheque or Money Order:

1. Please make out a Cheque or Money Order, made payable to **University of Toronto** in the amount of $11.24 CAD.

2. Refer to the invoice number memo section of the Cheque or Money Order.

3. Print out this invoice and mail with payment to:

University of Toronto

Appendix J

Detailed Study Model Results for Hypothesized Relationships

Table 18

Detailed Study Model Results for Hypothesized Relationships

Dependent Variable	Independent Variables	b	SE b	β	β *t*-value	β p-value (2-tailed)	R^2
Nurse-assessed quality of patient care (group-level)	Structural empowerment	.09	.02	.39	6.35	.000	.50***
	Group processes	.39	.05	.61	10.00	.000	
	Length of stay (LOS)	-.02	.01	-.27	-3.40	.001	
	Staffing (HPPD)	.03	.02	.13	1.70	.089	
Patient satisfaction	Structural empowerment	-.00	.01	-.02	-.29	.773	.20
	Group processes	-.02	.06	-.03	-.29	.774	
	Length of stay (LOS)	-.03	.01	-.44	-2.99	.003	
	Staffing (HPPD)	-.00	.02	-.02	-.15	.880	
Therapeutic self care	Structural empowerment	.02	.02	.07	.89	.376	.01
	Group processes	.07	.08	.10	.90	.366	
	Length of stay (LOS)	.00	.01	.02	.17	.867	
	Staffing (HPPD)	.01	.02	.02	.27	.787	
Falls	Structural empowerment	-.24	.13	-.12	-2.02	.044	.29***
	Group processes	-1.11	.59	-.19	-2.07	.039	
	Length of stay (LOS)	.23	.06	.36	4.16	.000	
	Staffing (HPPD)	-.80	.21	-.36	-4.07	.000	
Nurse-assessed risk	Structural empowerment	.02	.01	-.11	-1.74	.082	.31**
	Group processes	-.09	.05	-.17	-1.84	.067	
	Length of stay (LOS)	.02	.01	.31	2.96	.003	
	Staffing (HPPD)	-.09	.02	-.44	-4.97	.000	
Job satisfaction	Empowered behaviours	.08	.02	.15	4.33	.000	.26***
	Psychological empowerment	.75	.07	.39	11.20	.000	
	Years nursing	.01	.00	.09	2.26	.024	
Nurse-assessed quality of patient care (individual-level)	Empowered behaviours	.04	.02	.10	2.38	.017	.08***
	Psychological empowerment	.28	.05	.22	5.51	.000	
	Years nursing	-.00	.00	-.02	-0.47	.641	

Note. *p<.05, **p<.01, ***p<.001; HPPD = nursing care hours per patient day; b = unstandardized beta; SE = standard error, β = standardized beta.

VITA

Name:	Nancy M. Purdy
Post-secondary Education and Degrees:	McMaster University Hamilton, Ontario, Canada 1974-1978 B.Sc.N. The University of Western Ontario London, Ontario, Canada 1986-1991 M.Sc.N. The University of Western Ontario London, Ontario, Canada 2003-2011 Ph.D.
Honours and Awards:	Dorothy Ferguson Scholarship, Registered Nurses Foundation of Ontario 2008 Dorothy Wylie Leadership Fellowship Award Nursing Leadership Network of Ontario 2007 Academy of Canadian Executives in Nursing Scholarship 2006 Hospital Achievement Award, Peel Memorial Hospital 1997 Research Grant, Registered Nurses Association of Ontario 1991 Bursary for academic achievement, McMaster University 1977
Related Work Experience:	Associate Professor Ryerson University, Toronto, Ontario 2008-current Research Associate The University of Western Ontario, London, Ontario 2003-2007 Director of Professional Practice and Chief Nursing Officer William Osler Health Centre, Brampton, Ontario 1999-2003

Publications:

Purdy, N., Laschinger, H. K. L., Finegan, J., Kerr, M., & Olivera, F. (2010). Effects of work environments on nurse and patient outcomes. *Journal of Nursing Management, 18*, 901-913.

Laschinger, H. K. S., Purdy**,** N., & Almost, J. (2007). The impact of leader-member exchange quality, empowerment, and core self evaluation on nurse managers' job satisfaction*, Journal of Nursing Administration.* 37 (5), 221-229.

Laschinger, H., Purdy**,** N., Cho, J. & Almost, J. (2006). Antecedents and consequences of nurse managers' perceptions of organizational support. *Nursing Economics*, *24* (1), 20-29.

Laschinger, H., Almost, J., Purdy, N. & Kim, J. (2004). Predictors of nurse managers' health in Canadian restructured health care settings*. Canadian Journal of Nursing Leadership. 17* (4), 88-105.