THE IMPACT OF NURSE WORK ENVIRONMENT ON NURSE OUTCOMES, NURSE-PERCEIVED QUALITY OF CARE AND PATIENT SAFETY IN SAUDI ARABIA

by

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A THESIS PROPOSAL SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIRMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

(Nursing)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

April 2018

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Abstract

Background: The current shortage of nurses jeopardizes the quality and safety of patient care globally, and is particularly serious in Saudi Arabia. There is ample evidence that nurse work environments are important to nurses' job satisfaction, burnout, and retention, and the quality and safety of patient care. However, most of this research has been conducted in the United States and Europe with very little emanating from Saudi Arabia or the Middle East.
Purpose: This study investigated relationships between components of nurse work environment and nurse outcomes and nurse-perceived quality of care and patient safety.
Methods: This correlational study was conducted using cross-sectional data collected from 496 registered nurses working in a large tertiary hospital in Riyadh, Saudi Arabia.
Participants completed an online survey similar to that used in RN4Cast studies. Nurse-reported measures were used to assess nurses' perceptions of their work environments, nurse-outcomes (i.e., job satisfaction, burnout, and intent to leave), and nurses' perceptions of quality of care and patient safety. Hierarchical logistic regression was conducted to examine the relationships between components of nurse work environment and nurse and patient outcomes, after controlling for nurse and patient characteristics.

Findings: Nurses' perceptions of staffing and resource adequacy was predictive of all nurse outcomes except for intent to leave whereas nurse manager ability and leadership was found to be predictive only of job satisfaction. In terms of patient outcomes, staffing and resources adequacy and nursing foundation for quality of care were found to be the only independent predictors of quality of care and patient safety.

Implications for Nurse Leaders: Nurse leaders in Saudi Arabia should give special attention to staffing and resources adequacy, nursing management and leadership, and nursing foundation for care delivery at the unit level. Hospitals in Saudi Arabia should strive for magnet-like qualities as they play a critical role in the recruitment and retention of nurses and contribute to better quality and safe care delivery.

Conclusion: Magnet-like work environments that are culturally sensitive are critical to attracting and retaining Saudi nurses and nurses from other countries who are currently vital to alleviating the nursing shortage in Saudi Arabia.

Lay Summary

This study investigated characteristics of nurses' work environment that influence quality of care, patient safety, and nurse outcomes such as job satisfaction and burnout in Saudi Arabia. The results indicated that the adequacy of staffing and other resources, nursing leadership, and hospital support for professional nursing practice (e.g., continuing education and the use of a nursing model rather than a medical model) are associated with higher quality of care and patient safety, and better nurse outcomes. These results are consistent with similar studies conducted in other countries, and reinforce the importance of adequate nursing practice. These results are particularly important in Saudi Arabia for recruiting and retaining Saudi nurses as well as expatriate nurses who are currently crucial to alleviating the nursing shortage in Saudi Arabia.

Preface

This thesis is an original, unpublished, intellectual product of Amal Alharbi. The research study was conducted under the supervision of committee members: Dr. Susan Dahinten (Supervisor), Dr. Maura MacPhee, and Dr. Angela Wolff. I conducted the literature review, collected the data, and wrote Chapters 1 to 5. Design of the study was completed in collaboration with Dr. Dahinten and Dr. MacPhee. Data analysis was completed in collaboration with Dr. Susan Dahinten. All committee members reviewed and provided feedback on Chapters 1 to 5. Ethics approval was received from the University of British Columbia Research Ethics Board (ethics approval number H17-00219).

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Acknowledgements

All praises and thanks be to Allah, who guides and supports me through persistence, patience, and faith "For indeed, with hardship [will be] ease. For truly with hardship comes ease" **Quran 94:5-6**

I would like to extend my deepest gratitude to my thesis supervisor, Dr. Susan Dahinten. Susan, thank you so much for believing in me, being a thought-provoking mentor, and always challenging me to do better. You truly are a mentor who facilitates learning and growth for students at every opportunity. You have taught me so much throughout my studies; taught me patience and gave me strength to endure this rewarding journey. Next, I owe particular thanks to Dr. Maura MacPhee. Maura, thank you very much for all the support and counseling you have provided. I thank you for all the hard work you have done to facilitate this learning privilege. I also take this time to thank Dr. Angela Wolff for her countless insights and valuable expertise throughout this journey.

I also give my highest regards to University of Tabuk, represented by the Saudi Cultural Bureau, for gifting me this scholarship that has given this once in a life opportunity to grow academically. Special appreciation is also given to the University of British Columbia for the School of Nursing's Katherine McMillan Director's Discretionary Fund that supported me to undertake this study.

Thanks and best wishes, too, to all my nursing colleagues, who despite their heavy workload, have taken time to participate in The Impact of Nurse Work Environment in Saudi Arabia study. For without whose support and cooperation, I would not have been able to conduct this analysis of my thesis.

I would finally, but not least, like to extend my enduring gratitude to my parents, Ali and Shaikah, for their unconditional and unwavering support and consul throughout my life and particularly during my years at UBC. They have giving so much more than I can ever repay them, and for that I'm eternally grateful. I wish to thank my all my siblings whom without their support I would not have been able to fulfill one of my many goals in life. I would like to single out my sister Arwa for her constant emotional support she has bestowed on my forever humbled self. I also extend my sincere gratitude to my friends, all of whom have supported me throughout the years.

Chapter 1: Introduction

The current shortage of nurses is a global issue that jeopardizes the quality and safety of patient care in healthcare systems all over the world (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002b; Broughton, 2015; Rafferty et al., 2007). The situation in Saudi Arabia is particularly serious as there is a significant shortage of nurses in general, and of Saudi nationals in particular. The nurse-patient ratio in Saudi Arabia is 36 nurses per 10,000 patients, considerably lower than in many other countries such as Canada (100/10,000), the UK (101/10,000), Japan (95/10,000), and other Middle East countries such as Bahrain (58/10,000) (World Health Organization [WHO], 2010). Saudi Arabia has relied on expatriate nurses for the majority of their nursing workforce for several years, which led to a serious nurse staffing crisis during the Second Gulf War (1990) when many foreign nurses suddenly departed without notice. Despite the Royal decree passed in 1992 calling for "Saudization" where the expatriate workforce would be replaced with Saudi nationals (Aboshaiqah, 2016), and the government's effort to attract and retain more Saudi nurses in the nursing profession, Saudi nurses constituted only 32% of the total nursing workforce in Saudi Arabia in 2009 (Ministry of Health [MOH], 2009). Some of the factors that deter Saudi nationals from choosing nursing as a profession are the negative perceptions of nursing and low status associated with nursing (Alyami & Watson, 2014). Moreover, unfavorable working conditions such as long hours and heavy workloads (Aboshaiqah, 2016; Alotaibi, Paliadelis, & Valenzuela, 2016), not only deter Saudi nationals from becoming nurses, but have also resulted in a rapid turnover rate of foreign nurses (less than $2\frac{1}{2}$ years on average; Alyami & Watson; Walston, Al-Harbi, & Al-Omar, 2008). However, research evidence has shown that there are other aspects of nurses' work environment that are important to nurses' job satisfaction, burnout, intent to leave, and nurse retention, as well as to the quality of nursing care provided, and ultimately to patient safety outcomes. Most of this research has been conducted in the United States and Europe, with very little emanating from Saudi Arabia or the Middle East. Therefore, the aim of this study was to investigate the quality of nurses' work environment in Saudi Arabia, and its relationships with nurse outcomes, quality of nursing care, and patient safety outcomes.

1.1 Nurse Work Environment

Nurse work environment refers to the organizational attributes of the "work settings that facilitate or constrain professional nursing practice" (Lake, 2002, p.178). Over the years, work environment research focused on exploring attributes of a desirable work environment for nurses and examined their influence on multiple outcomes including nurse and patient safety outcomes (Pearson et al., 2007). Multiple studies on work environment and its impact on nurse outcomes demonstrated a strong relationship between attributes of nurse work environment and nurse outcomes such as job satisfaction, work-related burnout, and intent to leave (Aiken, Clarke, Sloane, Lake, & Cheney, 2008a; Coetzee, Klopper, Ellis, & Aiken, 2013; Kutney-Lee, Wu, Sloane, & Aiken, 2013; Liu et al., 2012). The effects that nurse work environment have on nurse outcomes also pose costs to the healthcare systems through their effects on illness/injury rates, overtime, staff turnover, recruitment and retention costs, as well as costs related to quality of patient care (Geiger-Brown & Lipscomb, 2010; Pearson et al., 2007).

In 2004, the landmark report *Keeping Patients Safe: Transforming the Work Environment of Nurses* was published by the Institute of Medicine [IOM] (IOM, 2004) highlighting the importance of workplace environment in improving the quality of nursing care. The IOM (2004) indicated that "the typical work environment of nurses is characterized by many serious threats to patient safety" (P. 3). Nursing researchers found that patient safety outcomes were significantly influenced by work environment attributes including nurse perceptions of overall safety, and specific patient adverse events, such as patient falls with injury, medication errors, and pressure ulcers (Lee & Scott, 2016). Nurse perceptions of quality of nursing care was also shown to be influenced by attributes within nurse work environments (Aiken et al., 2008a; Coetzee et al., 2013; Van Bogaert et al., 2014).

The majority of studies exploring the relationships between nurse work environment and nurse outcomes, nurse-perceived quality and safety of care, and specific patient safety outcomes were conducted primarily in Western contexts such as the United States (Aiken et al., 2008a), Canada (Friese, Lake, Aiken, Silber, & Sochalski, 2008) and Europe by initiatives such as the Nurses Early Exit (NEXT) and RN4CAST (Aiken et al., 2012; Estryn-Be'har et al., 2007). Similar research was conducted in some Asian countries such as Thailand (Nantsupawat et al., 2012) and China (You et al., 2013), as well as South Africa (Coetzee et al., 2013).

There is limited work environment research from the Middle Eastern region. For example, in a study of 69 nurses working in Lebanese hospitals, El-Jardali and colleagues (El-Jardali et al., 2011) found a positive relationship between unfavorable nursing work environments and nurses' intention to leave. Two studies in Jordan explored the association between nursing work environment and job satisfaction and intent to leave (AbuAlRub, El-Jardali, Jamal, & Al-Rub, 2016; Al- Hamdan, Manojlovich, & Tanima, 2016). Both studies found that more favorable work environments were associated with greater nurses' job satisfaction and intent to stay. One study that measured components of nurses' work environment (Aboshaiqah, 2015) was solely a descriptive study that did not investigate outcomes associated with work environment. A few other studies looked at nurse outcomes such as nurse job satisfaction (Al-Ahmadi, 2002; Al-Ahmadi, 2009; Alasmari & Douglas, 2012; Zaghloul et al., 2008), nurse burnout (Al-Turki, 2010), and nurse intention to leave (Al-Ahmadi, 2009; Zaghloul et al., 2008) but not in association with nurse work environment. In addition, there was a qualitative study (Alotaibi et al., 2016) that explored Saudi nurses' perceptions of factors that affected their job satisfactory. I also located two Saudi studies that explored patient safety (El-Jardali, Sheikh, Garcia, Jamal, & Abdo, 2014; Mwachofi, Walston, & Al-Omar, 2011); but neither of these investigated the influence of nurse work environments on patient safety outcomes.

No previous studies in Middle Eastern regions, therefore, examined the relationship between nurses work environment and nurse outcomes, nurse-perceived quality of care, and specific patient safety outcomes.

1.2 Problem Statement

Healthcare organizations in Saudi Arabia rely on expatriate nurses due to the insufficient supply of Saudi nurses to meet the demands of health staffing. Despite the "Saudization" policy aimed to increase the number of local nurses, 74% of the nursing professionals in Saudi Arabia are expatriates (Aboshaiqah, 2016). Combined with the rapid population growth and expansion of healthcare organizations across the country, the current global nursing shortage exacerbates the serious shortage of nurses in Saudi Arabia (Almalki, Fitzgerald, & Clark, 2011). Nurses constitute the largest group of healthcare professionals

and provide most of the direct bedside care; thus, the recruitment of more Saudi nurses and the retention of all nurses (Saudi and expatriate) are essential for the provision of quality care (Needleman, Kurtzman, & Kizer, 2007).

Creating a healthy work environment is fundamental to nurse retention and recruitment, the provision of safe, quality care, and ultimately, health care institutions' financial viability (Buchan, 2010). An increasing body of evidence shows the associations between nurse work environment and nurse outcomes such as job satisfaction, work-related burnout and turnover intentions, as well as nurse-perceived quality and safety of care and specific patient safety outcomes. While relationships between nurse work environments and nurse and patient outcomes have been well described in North American, Asian, and European contexts, little is known about these relationships in Saudi Arabia. The ongoing nursing shortage and increasing demands for health care in Saudi Arabia makes it important to understand the effects of the work environment on nurse outcomes, quality of care, and patient safety outcomes. Thus, this study investigated how nurses in Saudi Arabia perceive their work environment, providing the first empirical evidence of the interrelationships among nurse, patient and quality and safety factors mentioned above. Results of this study will broaden the body of literature on the significance of nurse work environments by comparing the Saudi nurses' work environments with evidence from other countries. Results will also inform Saudi nurse administrators about aspects of the work environment that contribute most to nurse perceptions of quality, safe patient care delivery.

1.3 Research Purpose and Questions

The purpose of this study was to examine relationships between components of nurse work environments and nurse outcomes, and nurse-perceived quality of care and patient safety among a sample of registered nurses (N= 496, RNs) working in a large multispecialty hospital in Riyadh city, Saudi Arabia. The study aimed to answer the following questions:

 What are the relationships between components of the nurse work environment and nurse outcomes (i.e., job satisfaction, burnout, and intent to leave) after controlling for nurse and patient characteristics?

- 2) What are the relationships between components of the nurse work environment and nurse-perceived quality of care after controlling for nurse and patient characteristics?
- 3) What are the relationships between components of the nursing work environment and nurse-perceived patient safety outcomes after controlling for nurse and patient characteristics?

1.4 Outline of Thesis Proposal

This chapter has provided an introduction to the study and a brief overview of the research literature on nursing work environment and the impact it has on nurse, patient, and system outcomes, and identified the purpose of the study and research questions to be answered.

Chapter 2 provides a review of empirical literature on key concepts in the study: nurse practice environments, nurse outcomes, quality of nursing care and patient safety outcomes, and their inter-relationships. Chapter 3 discusses study methods, beginning with a description of research design, setting and sampling plan, access and recruitment methods. Data collection methods, measures, analytical procedures, and ethical consideration are also described. Study findings are presented in Chapter 4 and discussed in Chapter 5.

Chapter 2: Literature Review

The purpose of this study was to examine the relationships between nurse work environments and nurse outcomes, and nurse-perceived quality of care and patient safety outcomes in Saudi Arabia. This chapter provides a review of empirical literature on key concepts in the study: nurse work environments, nurse outcomes, quality of care and patient safety outcomes, and their inter-relationships. This chapter is organized as follows:

- Nurse Work Environment: This section provides an overview of the concept of nurse work environment including historical perspectives; the development of scales to measure the nurse work environment; and an introduction to the impacts of nurse work environment on nurse outcomes, quality of nursing care, and patient safety outcomes.
- Nurse Outcomes: This section discusses theoretical perspectives on (1) nurse job satisfaction, (2) work-related burnout, and (3) intention to leave, and the empirical literature on their associations with nurse work environment.
- Quality of Care and Patient Safety Outcomes: This section reviews the literature on (1) quality of care and (2) patient safety outcomes, and their relationships with nurse work environment.
- Impact of components of nurse work environment on nurse outcomes, quality of care and patient safety outcomes.
- 5) Nurse Work Environment within the Middle Eastern context.
- 6) Chapter Summary.
- 7) Conceptual Framework.

2.1 Search Strategy

The search for related literature was conducted by systematically searching the following databases: CINAHL, Medline, PubMed, PsycINFO, ScienceDirect, and Web of Science. The key terms that made up the search included nurse/nursing work environment, practice environment, magnet hospital, magnetism, nursing shortage, nurse outcomes, job satisfaction, 'intent to leave', 'turnover intention', burnout, patient outcomes, patient safety, adverse events, quality of nursing care, nurs*, Saudi nurses, nursing, and Saudi Arabia.

MeSH terms were used where possible, and no exclusion criteria were applied except for English language. All articles were reviewed for relevance, and those that addressed constructs of interest were retained. A variety of quantitative and qualitative studies in nursing and non-nursing literature, along with review articles, were included. The bibliographies of relevant articles and citation indices were also examined for relevant studies.

2.2 Nurse Work Environment

Within nursing literature, there is little consensus on the definition and attributes of the nursing work environment. However, it is generally conceptualized as the organizational attributes of the "work settings that facilitate or constrain professional nursing practice "(Lake, 2002, P. 178). According to Kotzer and Arellana (2008), it is a multidimensional phenomenon that entails various organizational characteristics that impact the practice of nursing. Laschinger (2008) stated that work environment is one where nurses feel empowered through the provision of greater opportunities for autonomy, accountability, and control over the environment. It is the system that assists registered nurses to gain control over the provision of nursing care and the environment in which they deliver the care (Hoffart & Woods, 1996).

2.3 Historical Perspectives

Nursing work environment has attracted nurse scientists' attention since the early1980s when a nursing shortage posed a national threat to the United States health system. In 1981, an initial attempt began by the American Academy of Nursing (AAN) to identify attributes of hospitals that consistently succeeded in recruiting and retaining professional nurses during the shortage (McClure et al., 1983 as cited in Lake, 2002). These hospitals were identified as "magnet" due to their ability to attract and retain professional nurses while providing excellent nursing and patients care despite the national nursing shortage (American Nurses' Credentialing Center [ANCC], 2000; Kramer & Schmalenberg, 1988a; Kramer & Schmalenberg, 1988b; Scott et al., 1999). As a result, 46 hospitals in the US were designated as "magnet hospitals" based on their organizational characteristics that helped provide adequate nursing staff and fostered excellent nursing care. Subsequently, group interviews with the nurse directors and staff nurses working in 41 participating hospitals were conducted. These interviews uncovered a shared set of organizational characteristics commonly present in magnet hospitals that enabled greater capacity to attract and retain nurses (McClure et al., 1983 as cited in Lake, 2002). These characteristics have become known as the 14 ''forces of magnetism'' representing key factors associated with excellent nursing and patients care including, but not limited to, quality of nursing leadership, adequate resources and support, nurse autonomy, accountability, and responsibility for quality patient care, interdisciplinary relations and adequate staffing and flexible scheduling (ANCC, n.d). Ten years later, the ANCC established the magnet Recognition Program[©] primarily based the 14 forces of magnetism that were identified in the original magnet hospital research (Kramer & Schmalenberg, 2005a).

Following the original magnet hospital study, extensive research was conducted to investigate organizational characteristics that are common to hospitals that have excellent nurse recruitment and retention rates and provide high quality nursing care. Results of these studies constitute the original body of knowledge on what constitutes a desirable work environment for nurses. In a literature review of 45 studies published between 1976 and 1996 on magnet hospital research, Scott et al. (1999) found that autonomy, control over practice, and collaborative relationships were the most commonly studied attributes of nurse practice environment. The main nurse and patient safety outcomes that were most commonly investigated during the same period included job satisfaction, mortality, and patient satisfaction (Scott et al., 1999).

Further investigation of nurse work environment and its influence on nurse and patient safety outcomes revealed eight structural attributes that enable the delivery of safe and quality patient care including: collegial-collaborative nurse-physician relationships, practice of clinical autonomy, working with clinically competent peers, supportive nurse manager relationships, perceived adequacy of staffing, control of nursing practice, maintenance of a patient-centered culture, and support for education (Kramer & Schmalenberg, 2004a; 2005b). In addition to previous nurse and patient outcomes, nurse burnout, patient adverse events and nurse reported quality of care were included in this research (Kramer & Schmalenberg, 2005a).

2.4 Instrumentation

The work on magnet hospitals done by Kramer and colleagues during the 1980s led to the development of the 65-item Nursing Work Index (NWI) (Kramer & Hafner, 1989) which was designed to measure the extent to which an organization demonstrates attributes of excellent and professional nursing practice environment. It consisted of a comprehensive list of all organizational attributes that were identified as having an influence on nurse job satisfaction and nurse perceptions of quality nursing care (Kramer & Hafner, 1989; Lake, 2002) in the original magnet hospital study (McClure et al, 1983) or other research literature from 1962 to 1986 (as cited in Lake, 2002). Early researchers using the NWI investigated whether nurses in different roles (i.e., staff nurses, clinical nurse experts, and head nurses) shared common values related to their work environments, and the impact of those values on nurse outcomes and perceived quality of care (Kramer & Hafner, 1989). Researchers also used the NWI to gain insight into job satisfaction and how it varied between nurses working in magnet versus non-magnet hospitals (Kramer & Schmalenberg, 1991). Building on the original magnet hospital study and the work of Kramer and colleagues, a number of other instruments were developed from the NWI. These include the Nursing Work Index- Revised (NWI-R) (Aiken & Patrician, 2000), the Practice Environment Scale of the Nursing Work Index (PES-NWI-Lake, 2002), and the Practice Nursing Work Environment (PNWE) (Choi, Bakken, Larson, Du, & Stone, 2004).

The PES-NWI is the most widely used tool to assess nurses' perceptions of their practice environment (Warshawsky & Havens, 2011). Using a five-stage approach, Lake developed the PES-NWI to identify attributes of nursing work environment that have an influence on nurse and patient outcomes (Lake, 2002). Its reliability and validity were initially established using data from two independent studies including large samples of nurses in magnet versus non-magnet hospitals. Of the 65 NWI items, 48 that met the definition of the nursing work environment were selected for use in the PES-NWI. Using nurse data collected in 1985-1986 from 16 magnet hospitals, exploratory factor analysis was conducted to detect subscales that represent aspects of nurse work environment along with clusters of highly related items. Internal consistency was found to be satisfactory with Cronbach's alphas that ranged from .71- .84. Construct validity was judged by the ability of the measure to differentiate between nurses working in magnet versus non-magnet hospitals.

Significantly higher mean subscale scores and composite scores were found for nurses in magnet-recognized hospitals than for nurses working in non-magnet recognized hospitals (p < .001). Confirmatory analysis was supported using data from a large sample of staff nurses (N=11,636) in Pennsylvania hospitals (Lake, 2002). The final PES-NWI consists of 31 items representing five domains: nurse participation in hospital affairs; nursing foundations for quality of care; nurse manager ability, leadership, and support of nurses; staffing and resource adequacy; and collegial nurse-physician relations (Lake, 2002).

In 2007, Lake reviewed seven instruments measuring nursing practice environments that were developed between 1996 and 2005 including the NWI-R and the PES-NWI. Among the seven, the PES-NWI was endorsed as the "most useful instrument" for capturing nurses' perceptions of practice environment (Lake, 2007, p. 117S). The PES-NWI was adopted by several nurse researchers to measure nurse perceptions globally. In these instances, PES-NWI reliability and validity were examined and confirmed (Aiken et al., 2008a; Coetzee et al., 2013; Friese et al., 2008; Lake & Friese, 2006). Although the PES-NWI has not been used in Saudi Arabia, Liou and Cheng (2009) tested the subscales for validity and reliability among a sample of Asian nurses (*N*=230) working in the U.S and found it to have acceptable validity and reliability when applied to Asian nurses.

2.5 The Significance of Nurse Work Environments

An abundance of evidence demonstrates that professional nurse practice environments are associated with positive nurse outcomes such as intention to remain employed in the job (Hinno, Partanen, & Vehvilainen-Julkunen, 2011; Tourangeau & Cranley, 2006; Van Bogaert, Meulemans, Clarke, Vermeyen, & Van de Heyning, 2009a), job satisfaction (Friese, 2005; Laschinger, Almost, Tuer-Hodes, 2003; Manojlovich, 2005; Van Bogaert et al., 2009a), lower levels of nurse burnout (Aiken et al., 2001; Friese, 2005), and higher quality of nursing care (Friese, 2005; Hinno et al., 2011; McCusker, Dendukuri, Cardinal, Laplante, & Bambonye, 2004; Van Bogaert et al., 2009a). In contrast, poor nurse work environments are associated with an increased likelihood of negative patient outcomes including nurse-reported adverse patient events (Laschinger, & Leiter, 2006), failure to rescue (Friese et al., 2008), and patient mortality (Aiken et al., 2008a; Friese et al., 2008). Details of these and other studies are discussed following a discussion of the literature on nurse outcomes, quality of nursing care, and patient safety outcomes.

2.6 Nurse Outcomes

2.6.1 Nurse job satisfaction.

Job satisfaction is a concept studied extensively by nurse researchers as well as researchers in other disciplines including human resources management, organizational management, psychology, and economics for more than 100 years (Castaneda & Scanlan, 2014). Despite the substantial literature on employees' job satisfaction in general and within nursing in particular, there seems to be no agreed-upon precise and consistent definition of job satisfaction (Cavanagh, 1992; Hayes et al., 2010). It is typically defined as the extent of positive attitudes or affect one has towards their job (Price & Mueller, 1986 as cited in Mrayyan, 2006). These feelings are considered to be highly subjective and vary over time (Cumbey & Alexander, 1998). According to Fung-Kam (1998), job satisfaction is the "affective reaction to a job that results from the comparison of perceived outcomes with those that are desired" (p.355). Job satisfaction, according to McKenna (2000), is one's attitude towards how well their personal expectations at work are consistent with the outcomes. Therefore, the extent to which the job fulfills an individual's own work values can result in a positive emotional state of job satisfaction or an opposite negative feeling of dissatisfaction. In a recent concept analysis of job satisfaction in nursing, the authors concluded that there appears to be a general agreement in the literature that job satisfaction is best defined as the "affective (i.e., emotional) reaction to a job that results from the incumbent's comparison of actual outcomes with those that are desired, expected, and observed" (Castaneda & Scanlan, 2014, p.136).

Job satisfaction is cited as the number one predictor of nurses' intention to remain employed (Cavanagh, 1992; Duffield, Roche, Blay, & Stasa, 2010; Fitzgerald, 2007; Gauci-Borda, & Norman, 1997; Laschinger, Leiter, Day, & Gilin, 2009; Strachota, Normandin, O'Brien, Clary, Krukow, 2003). When nurses reported dissatisfaction about their jobs, their absenteeism increased (Kelly, McHugh, & Aiken, 2011; Tourigny, Baba, & Wang, 2010); they were less committed to their units and/or institutions (Ahmad, & Oranye, 2010); they also were more stressed which, in turn, resulted in burnout (Jourdain & Chenevert, 2010; Maslach & Jackson 1981) and an increased intent to leave their current jobs (Coomber & Barriball, 2007; Djukic, 2011; Hayes, Bonner, & Pryor, 2010). In contrast, nurses' job satisfaction had a positive impact on nurses' subjective well-being (Murrells, Clinton, & Robinson, 2005), physical health (Abushaikah & Saca-Haazboun, 2009), and personal life satisfaction (Golbasi, Kelleci, & Dogan, 2008). As the nursing shortage grows and difficulties in retention become a global issue, there is an urgent need to identity all aspects influencing job satisfaction among nurses.

Factors contributing to nurses' job satisfaction can be categorized into intra-personal (i.e., related to individual nurse characteristics), inter-personal (i.e., between nurses and coworkers), and extra-personal (i.e., influenced by institutional policies) factors (Hayes et al., 2010). Intrapersonal factors such as nurses' age, educational qualifications, and years of experience were shown to influence nurses' job satisfaction (Chang, Li, Wu, & Wang, 2010; Sheward, Hunt, Hagen, MacLeod, & Ball, 2005; Wilson, Squires, Widger, Cranle, & Tourangeau, 2008). Nurses who were older and had longer years of experience were found to be more satisfied with aspects of their jobs (Hayes et al., 2010). Interpersonal factors include nurses' interactions with colleagues and patients, autonomy, control over practice, decisionmaking, direct patient care (e.g., good relationships with patients, a joy of providing a good care to patients and watching them get better) (Hayes et al., 2010; Castaneda & Scanlan, 2014). Castaneda and colleagues found autonomy and interpersonal relationships to be repeatedly identified as one of the most significant attributes contributing to nurses' job satisfaction. Extra-personal factors such as remuneration (e.g., pay, benefit), workload, scheduling, and organizational structure were reported to influence nurses' satisfaction (Hayes et al., 2010).

Job satisfaction researchers typically use two different approaches to assess job satisfaction, the facet and global approaches (Spector, 1997). The global approach is adopted when the researcher aims to measure the nurse's overall feeling about the job, whereas the facet approach is used to determine which specific aspects of the job are contributing to individual's satisfaction or dissatisfaction (Cicolini, Comparcini, & Simonetti, 2014). There are also different instruments available pertaining to each approach. For instance, Ouyang, Zhou, and Qu (2015) used Spectors' Job Satisfaction Survey (Spector, 1997), which consists of nine dimensions measuring job satisfaction. Wilson et al. (2008) used the McCloskey/Mueller Satisfaction Scale (MMSS, 1990), which measures eight dimensions of nurses' job satisfaction including extrinsic rewards, scheduling, balance of family and work, coworkers, interaction opportunities, professional opportunities, praise and recognition, and control and responsibility. Additionally, Ahamd and Oranye (2010) used a multidimensional index adapted from the job satisfaction Index developed by (Stamps, 1997) which measures job satisfaction in relation to six dimensions: pay, autonomy, task requirements, professional status, interaction, and organizational policies.

In contrast, several researchers adopted the global approach where they used simpler approaches to measure nurses' job satisfaction such as a 4-item global measure of work satisfaction adapted from Hackman and Oldham's job diagnostic survey (Laschinger, 2008; Laschinger, Finegan, & Shamian, 2001a,b; Laschinger, Finegan, & Shamian, 2011; Laschinger, Finegan, Shamian, & Wilk, 2004; Laschinger, Leiter, & Gilin, 2009a; Lautizi, Laschinger, & Ravazzolo, 2009; Manojlovich & Laschinger, 2002). Moreover, the RN4CAST studies used a single-item question to measure overall nurses' job satisfaction (Aiken et al., 2012; 2013).

2.6.2 Work-related burnout.

Burnout is a multidimensional psychological syndrome characterized by emotional exhaustion, depersonalization, and diminished personal accomplishment (Maslach, 1982). Burnout results from the gap between one's expectations to fulfill his/her duties and the failure of organizational structures (Leiter, 1991; 1992). Maslach and colleagues (2001) identified six aspects of work life that lead to burnout including workload, lack of control, lack of rewards, lack of community, lack of fairness and value conflict (Maslach, Schaufeli, & Leiter, 2001). These areas are often influenced by organizational and administrative policies and decisions resulting in feelings of emotional exhaustion, depersonalization and inefficacy. Emotional exhaustion is regarded to as an energy deficit and depletion of one's emotional resources as a result of excessive psychological needs of a job. Depersonalization occurs when employees treat others as objects, rather than human beings, through negative, callus, cynical, and uncaring behaviors and feelings. Diminished personal accomplishment refers to tendency to negatively evaluate oneself, especially regarding personal work with clients (Maslach, Jackson, & Leiter, 1996).

Burnout-related symptoms not only have a negative impact on individual worker, but can also decrease productivity, and negatively influence the quality of services provided (Schaufeli & Buunk, 2003). Researchers found that burnout had negative impacts on nurses' physical and mental health, as it was associated with anxiety, depression, somatization and physical tiredness (Khamisa, Peltzer, & Oldenburg, 2013). As burnout increased, nursereports of patient adverse events such as patient falls, nosocomial infections, medication errors increased (Laschinger & Leiter, 2006) and nurse-reported quality of care decreased (Poghosyan, Clarke, Finlayson, & Aiken, 2010).

Previous studies showed that nurses working in hospitals suffered from high levels of work-related burnout (McHugh, Kutney-Lee, Cimiotti, Sloane, & Aiken, 2011), levels that were higher than other health care professionals (Rada & Johnson-Leong, 2004; Chopra, Sotile, & Sotile, 2004). The high levels of nurses' burnout were mostly attributed to the nature of nurses' work where there is prolonged direct personal contact of an emotional nature compared to other health care workers (Levert, Lucas, & Ortlepp, 2000; Van Der Doef, Mbazzi, & Verhoeven, 2012). Individual characteristics such as age and years of experience (Ang et al., 2016; Maslach et al, 2001), work-related stress including role stress and hostility with colleagues and patients (Jourdain & Chenevert, 2010), and high physical and emotional demands (Van Den Tooren & de Jonge, 2008), were also found to be associated with higher levels of nurses' burnout. In addition to these factors, low levels of job satisfaction (particularly with supervisors and coworkers) played an important role in influencing nurse burnout (Kalliath & Morris, 2002; Önder & Basim, 2008; Tourigny et al., 2010).

There is evidence in the literature that the nurse practice environment has an influence on nurses' burnout. Numerous studies explored attributes of the work environment that positively or negatively influenced burnout among nurses. Among these attributes, heavy workloads and inadequate staffing levels were identified as antecedents of nurse burnout (Aiken et al., 2011b; Doef, Mbazzi, & Ver- hoeven, 2012; Lang, Patrician, & Steele, 2012; Liu et al., 2012; Teng, Shyu, Chiou, Fan, & Lam, 2010). In contrast, strong nursing leadership, nursing foundation for quality of care, positive nurse-physician relationships, and nursing participation in hospital affairs and decision making were associated with lower levels of nurse burnout (Kanai- Pak, Aiken, Sloane, & Poghosyan, 2008; Van Bogaert,

Kowalski, Weeks, Van Heusden, & Clarke, 2013b).

Various instruments are used to measure burnout such as the stress screening system for human service providers (Hacker et al., 1995) and the General Health Questionnaire (Goldberg & Hillier, 1979) (as cited in Westermann, Kozak, Harling, & Nienhaus, 2014). However, a systematic review by Westermann et al. (2014) found that the most commonly used tool to measure nursing burnout is the Maslsach Burnout Inventory (MBI, Maslach et al., 1996). This tool was developed by Maslach and colleagues in the late 1990s and is considered to be the most valid and reliable indicator of occupational burnout (Westermann et al, 2014). Several versions of the MBI were constructed for specific occupations. Among these versions is the MBI-Human Services Survey (MBI-HSS), which is a 22-item measure that incorporates three subscales: Emotional Exhaustion (EE), Depersonalization (DP), and Reduced Personal Accomplishment (PA). This tool was designed to measure characteristics of burnout experienced by employees working in human services organizations and health care professions, including nurses (Maslach et al., 1996). The EE subscale is often used as a proxy for the entire MBI (Westerman et al., 2014).

2.6.3 Intention to leave.

The increasing nursing shortage is one of the most serious issues threatening health care systems all over the world. This shortage has stimulated considerable research on nurses' turnover and their intentions to leave their jobs and/or profession. High nursing turnover has a negative influence on different levels of healthcare delivery including patient, nurse, and system outcomes (Davis, Ward Woodall, Shultz, & Davis, 2007; Hayes et al., 2006; 2012; O'Brien-Pallas et al., 2006). Turnover intention is conceptually defined as the worker's willingness or efforts to voluntarily leave their current positions (Sablynski, Lee, Mitchell, Burton, & Holtom, 2002; Vigoda-Gadot & Ben-Zion, 2004). According to Takase (2010)'s concept analysis, turnover intention is a complex, multi-phase process that incorporates psychological, cognitive, and behavioral elements leading to actual turnover. While this decisional process is triggered by negative psychological reactions to the surrounding internal and external job environment, the core of the process includes the cognitive component interpreted as intentions to leave and withdrawal behaviors. These withdrawal behaviors are recognized by manifestations of withdrawing from the job or

actions oriented to future opportunities (Takase).

High levels of nursing turnover had financial ramifications for healthcare organizations due to staff instability and productivity losses, which also hindered the safety and quality of healthcare delivery (Jone, 2008; O'Brien-Pallas, Tomblin Murphy, Shamian, Li, & Hayes, 2010). Inadequate staffing created by excessive nurse turnover resulted in high nurse-to-patient ratios and decreased productivity (Duffield, Roche, O'Brien-Pallas, & Catling-Paull, 2009a), and decreased quality of nursing care (Jone, 2008). O'Brien-Pallas et al. (2010) found that higher turnover rates were associated with negative nurse outcomes such as deteriorated mental health status, and decreased job satisfaction. High turnover rates were also associated with lack of continuity of nursing care (Duffield et al., 2009a), poor patient outcomes including pain (Castle & Lin, 2010), and increased likelihood of adverse events such as pressure ulcers (Castle & Lin, 2010), and medication errors (O'Brien-Pallas et al., 2010). Patient dissatisfaction with the care provided was associated with higher levels of nurses' intentionsto leave their job (Gardner, Thomas-Hawkins, Fogg, & Latham, 2007).

A myriad of factors have had an impact on turnover intentions, which can be categorized into individual, organizational, and work-related factors (Takase, 2010). Individual characteristics associated with greater nurses' intention to leave included being younger, having no kinship responsibilities, and experiencing a lack of challenge and development opportunities in their organizations (Hayes, 2012). Mixed results were found in regard to years of experience and educational background. For example, nurses with more years of nursing experience were less likely to report intentions to leave their jobs (Chan, Luk, Leong, Yeung, & Van, 2009; Delobelle et al., 2011; Tschannen, Kalisch, & Lee, 2010), although one contrasting study found that the odds of reporting turnover intentions were greater in nurses who had more than five years of experience (Ma, Lee, Yang, Chang, 2009). Similarly, studies have shown both higher (e.g., Stewart et al., 2011) and lower (e.g., Borkowski, Amann, Song, & Weiss, 2007) turnover intentions in relation to higher education levels. Organizational attributes and work-related job stressors associated with nurses' intention to leave included a lack of support by coworkers, leadership, and the organization; a lack of professional growth opportunities; inadequate resources; inadequate staffing; excessive workload; role stress; low job control, and low levels of autonomy (Hayes et al, 2012; Takase, 2010). Similar results were found by Sawatzky, Enns, and Legare (2015) who

also noted that job satisfaction, engagement, and work-related burnout functioned as intermediary factors that affected nurse's intention to leave.

2.6.4 Effects of nurse work environment on nurse outcomes.

During the last three decades, an abundance of empirical evidence demonstrated associations between unfavorable nurse work environments and poor nurse outcomes such as job dissatisfaction, work-related burnout (Aiken et al., 2008a; 2011b; Nantsupawat et al., 2011), and intention to leave (Aiken et al., 2008a; Nantsupawat et al., 2011). Similar findings were also obtained in cross-sectional studies by Liu et al. (2012) and Coetzee et al. (2013), and in a longitudinal study by Kutney-Lee et al. (2013), all of which measured work environment using the PES-NWI (Lake, 2002).

Liu et al., (2012) examined the relationship between hospital practice environment and job satisfaction, work-related burnout, and intention to leave among 1,104 bedside nurses from 89 units in 21 hospitals across the Guangdong province in China. The emotional exhaustion subscale of the Maslach Burnout Inventory (Maslach et al., 1996) was used to measure nurse burnout; nurse job satisfaction and intention to leave were each measured using a single item question. The study found that nurses working in better practice environments reported 50% less job dissatisfaction and 33% less work-related burnout than nurses working in poor practice environments.

Coetzee et al., (2013) conducted a similar study using a large sample of bedside nurses (N = 1187) working in medical, surgical, and critical care units from 62 private and public hospitals across six provinces in South Africa. Subscale scores for the PES-NWI were aggregated to obtain a total score by nurse; total scores were then aggregated at the hospital level and categorized into three levels: unfavorable, mixed, and favorable practice environments. Findings revealed that on a national level, 52% of nurses rated their practice environment as poor or fair, 46% reported high levels of burnout, and 54% intended to leave their hospital due to job dissatisfaction. A significant association was found between more favorable nurse work environments and more positive nurse outcomes in relation to job satisfaction, burnout, and intent to leave. Bedside nurses who reported better practice environments were half as likely to report poor nurse outcomes. The reliance on crosssectional data in this study and the study by Liu et al., (2012) precluded inference of a causal relationship between better practice environments and nurse outcomes, but the findings provided empirical support for the existence of a relationship between nurse perceptions of work environment and nurse outcomes.

In contrast to the two studies described above, Kutney-Lee, et al. (2013) conducted a longitudinal study to explore whether changes in nurse practice environment were associated with changes in nurse outcomes such as job satisfaction, job-related burnout, and intention to leave current position after accounting for simultaneous changes in nurse staffing levels. This study used survey data collected from large random samples of staff nurses from 137 Pennsylvania hospitals in 1999 (N = 9,345) and 2006 (N = 5,957). The researchers found that rates of nurse burnout, job satisfaction, and intention to leave current position improved between 1999 and 2006, and were strongly associated with improvements in nurse practice environments. This study provided one of the first empirical explanations on how changes in hospital practice environments are strongly linked to nurse outcomes including nurse retention.

The previous three studies examined the effects of work environment on nurse outcomes using only an aggregated measure of work environment. Although these research findings provided evidence that the practice environment as a whole influenced nurses outcomes, this approach precluded the ability to identify which particular aspects or components of the work environment were driving the relationships or had the strongest impact on nurses' outcomes.

2.7 Quality of Nursing Care and Patient Safety Outcomes

Following the release of the Institute of Medicine report "To Err Is Human" in 1999, patient safety drew significant attention in the U.S healthcare system due to the direct relationship of safety to people's health and well-being and medical expenses. Several billion dollars were spent annually on medical expenditures related to negative patient outcomes (Coomer, & Kandilov, 2016). The nursing workforce constitutes the majority of any healthcare system and nurses are the main contributor to patient outcomes (Institute of Medicine, 2004). Patient outcomes are considered to be nurse sensitive if they are directly affected by nursing care; that is, if more effective nursing care leads to improved patient outcomes (American Nurse Association [ANA], 2010). With the US quality/safety movement, a number of patient outcomes were identified as nurse-sensitive patient outcomes by the National Quality Forum (NQF, 2004), namely: falls, falls with injury, failure to rescue, pressure ulcers, urinary catheter-associated urinary tract infections, ventilatorassociated pneumonia, and central-line catheter-associated bloodstream infection. According to the NQF, these complications are preventable, directly associated with quality of nursing care, and account for substantial patient morbidity and mortality. Patient falls, infections, and medication errors have been the most frequently studied patient safety outcomes in the nursing literature because they are considered significant indicators for quality of care and are directly affected by nursing care (Nantsupawat, Nantsupawat, Kunaviktikul, Turale, & Poghosyan, 2016). However, only infections and patient falls were identified by the NQF (2004, 2009) and ANA (2010) as indicators for measuring nursing care performance, as medication errors were considered to be a systems problem.

A myriad of organizational factors were positively related to better patient outcomes (Aiken et al., 2008a; Friese et al., 2008; Trinkoff et al., 2011). Many studies that examined the associations between components of nurse work environment and patient safety outcomes focused on nurse staffing (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007; Lang, Hodge, Olson, Romano, & Kravitz, 2004; Penoyer, 2010). However, there were other essential components of nurse work environment associated with lower rates of negative patient outcomes such as collaborative nurse-physician relationships, higher levels of nursing education, and more years of experience (Stalpers, de Brouwer, Kaljouw, & Schuurmans, 2015).

In previous research, patient safety outcomes data were collected using several data sources. While some researchers used objective outcome measures, deriving their data from administrative databases such as medical records (Aiken et al., 2008a; Estabrooks, Midodzi, Cummings, Ricker, & Giovannetti, 2005; Fasolino & Snyder, 2012), others used surveys to measure nurses' subjective perceptions of quality of care and patient safety outcomes (e.g., Laschinger & Leiter, 2006; Manojlovich & DeCicco, 2007; McCusker et al., 2004). There is evidence demonstrating that nurses are reliable informants of the quality of care they provide and patient safety outcomes (Aiken et al., 2012; You et al., 2013). Williams (1998) concluded that nurses perceive quality of care as the extent to which physical, psychological,

and any additional care needs are met; thus, they can be a valuable source reporting the quality of care they provide. Nurse reports of overall quality care, therefore, were employed by a number of researchers who found it to be strongly related to patient safety outcomes, and they validated nurse reports with independent data on patients outcomes (Aiken et al., 2011a; 2012; Kutney-Lee et al., 2009; Lucero, Lake, & Aiken, 2010; McHugh & Witkoski Stimpfel, 2012).

2.7.1 Effects of nurse work environment on nurse-perceived quality of care and patient safety outcomes.

An ample body of evidence from various countries around the world linked nurses' perceptions of their work environments with nurse-reported quality of care and patient safety outcomes. Most of the studies found that more favorable nurse practice environments were associated with better quality nursing care (Aiken, Clarke, & Sloane, 2002a; Aiken et al., 2008a, 2012; Aiken, Buchan, Ball, & Rafferty, 2008b; Coetzee et al., 2013; Lake et al., 2016; Nantsupawat et al., 2011: Van Bogaert et al., 2014). In contrast, there were mixed findings in regard to the relationship between nurses' perceptions of their practice environment and nurse-reported patient safety outcomes (Coetzee et al., 2013; Lake et al., 2016; Van Bogaert et al., 2014). Different methods may account for the inconclusive findings in the literature.

Coetzee et al. (2013) examined the impact of nurse work environment on nursereported quality of care and patient safety with a large sample of RNs from 62 hospitals across six provinces in South Africa. Nurses were asked to report their confidence level that patients could manage their own care when discharged, and whether they would recommend their hospital to (1) their friends or family if they needed hospital care, and (2) to a nurse colleague as good place to work, as a measure of quality of care. An overall grade of patient safety was also measured subjectively. The authors found that better nurse practice environments were significantly associated with more positive reports of quality of care, but not with nurse-reported overall patient safety.

In another cross-sectional study, using survey data collected from a large sample of direct-care RNs (*N*=1108) working in 96 nursing units in Belgium, Van Bogaert et al. (2014) investigated the impact of three specific components of nurse work environment on nurse-reported quality of care and patient adverse events at the nursing unit level. This study used

three subscales of the Nursing Work Index Revised (NWI-R): nurse-physician relations, nursing management at the unit level, and hospital management and organizational support, as well as nurse-reported measures of care quality and patient safety. Nurses also reported the frequency of the following adverse patient events: patient and family complaints, patient and family verbal abuse, patient falls, nosocomial infections, and medication errors. Study findings showed that not all components of nurse work environment were related to all measures of quality of nursing care and patient safety outcomes. For example, satisfactory nurse manager ability and support at the unit level was found to be associated with better nurse-reported quality of care, fewer complaints from patients and their families, and fewer rates of medication errors, but not with patient falls or verbal abuse from patients and their families.

Most recently, Lake and colleagues examined the relationships between neonatal intensive care unit (NICU) practice environments and nurse-reported quality of care, patient safety, and selected patient outcomes (Lake et al., 2016). They conducted a secondary analysis of cross- sectional nurse survey data collected in 2005-2008 from 1247 NICU Registered Nurses working in 171 hospitals in four states in the USA. Results suggested that nurses who reported better work environments were 66% less likely to report fair/poor quality of care and 80% less likely to report poor safety scores as compared to nurses with poor work environments.

2.8 Impacts of Components of Nurse Work Environment on Nurse Outcomes, Quality of Care and Patient Safety Outcomes

Some studies explored the relationships between specific components of the nurse work environment and nurse outcomes and nurse-perceived quality of care. Of these, staffing and resources, nurse-physician relations, and managerial and organizational support were the most commonly studied components, and these were repeatedly found to have an impact on nurse outcomes such as job satisfaction, burnout, turnover intentions (e.g., Cho et al., 2009) and nurse-perceived quality of care (e.g., Friese, 2005; Hinno et al., 2011; Kanai- Pak et al., 2008).

Staffing levels were often measured by patient to nurse ratios on each shift. Aiken et al. (2002b) found that one extra patient per nurse was related to an increased likelihood of

nurses reporting job dissatisfaction (15%) and higher odds of nurse burnout (23%). Cho et al. (2009) investigated the association between nurse staffing and nurse-perceived quality of care, job satisfaction, burnout, and plan to leave among intensive care units nurses (N =13,365) in Korea. They demonstrated that nurses who perceived the staffing level as adequate were more likely to rate their quality of care as high and less likely to have a high level of burnout, be dissatisfied, and intend to leave their organization in the next year. Similar results were also found in a more recent study conducted by Choi, Cheung, and Pang (2013) among 1,271 registered nurses in Hong Kong where more positive perceptions of nurse staffing and other resources, as well as management support, were significantly associated with higher odds of job satisfaction and lower odds of intention to resign from current positions.

Studies by Friese (2005) and Van Bogaert et al. (2014) showed that more satisfactory nurse-physician relationships were associated with higher levels of nurse-perceived job satisfaction and quality of care. Van Bogaert et al. (2014) also found that hospital management and organizational support were associated with better job satisfaction and nurse-perceived quality of care, and lower intentions to leave the nursing profession.

A recent literature review of 18 studies published between 1999 and 2016 explored a total of 85 relationships between components of nurse work environment and subjective and objective measures of patient safety outcomes—with inconclusive findings (Lee & Scott, 2016). The six components of work environment were categorized according to Lake's (2002) five components of nurse practice environment and nurse autonomy. Twenty-six of the 85 relationships showed that better nurse work environments were associated with positive patients outcomes; one showed the reverse; and 57 were not significant, indicating no relationships between the two concepts. Moreover, no relationships were found between nurse participation in hospital affairs or nurse autonomy and patient safety outcomes (Lee & Scott, 2016).

Lee and Scott (2016) found that adequate staffing and resources and collegial relationships were the two most commonly studied components of nurse work environment in relation to patient outcomes, albeit with mixed results. For example, more positive nurse perceptions of staffing were associated with decreased rates of nurse-reported adverse events (Laschinger & Leiter, 2006), decreased patient hospitalization (Gardner et al., 2007), and

decreased patient falls (Broughton, 2015 as cited in Lee & Scott, 2016), whereas no significant association was found between staffing and medication errors (McCusker et al., 2004), 30-day mortality rates (Estabrooks et al., 2005), and rates of nurse-reported adverse events, particularly, nosocomial infections and patients and/or family complaints (McCusker et al., 2004). Moreover, a significant positive association was found between adequate staffing and increased rates of pressure ulcers (Broughton, 2015 as cited in Lee & Scott, 2016). Additionally, although satisfactory collegial relationships were found to be inversely related to 30-day mortality rate (Estabrooks et al., 2005), and patient hospitalizations (Gardner et al., 2007), mixed results were found between collegial relationships and other patient outcomes such as medical errors, patient falls, pressure ulcers, nosocomial infections, and patients and/or family complaints. For example, while unsatisfactory nurse-physician relationships were associated with increased rates of nurse-reported medication errors (Van Bogaert et al., 2014), McCusker et al. (2004) failed to find a significant relationship between the two concepts. Lee and Scott concluded that the lack of theoretical frameworks and substantial differences in instrumentation and other methods may have contributed to the inconsistent findings. They recommended more careful consideration of instrumentation and an increased use of longitudinal research designs.

2.9 Nurse Work Environment within the Middle Eastern Context

There has been limited research in the Middle Eastern region in regard to nurse work environment and the impact it has on nurse outcomes. For example, AbuAlRub et al. (2016) found a positive association between satisfactory nursing work environments and job satisfaction and intent to stay among a sample of Jordanian nurses (N= 330). Similar results were found in another Jordanian study of 650 registered nurses (Al-Hamdan et al., 2016). Nurses who perceived their work environment as favorable were found to be more satisfied and have higher intent to stay in their current positions. These results were consistent with an earlier study conducted with a small sample of Lebanese nurses (N= 69), which found an association between unfavorable nursing work environments and nurses' intention to leave (El-Jardali et al., 2011). Insufficient opportunities for professional development and career control were the most frequently reported aspects of work environment influencing nurses' intention to leave. Given the strong linkage between nurse retention problems and population health (International Council of Nurses, 2006), there is a critical need for more studies investigating the relationships between work environment and nurse outcomes,

To date, no studies examined the relationship between nurses' work environment and nurse outcomes, and nurse-perceived quality of care and patient safety outcomes in Saudi Arabia. The one study that measured components of nurses' work environment (Aboshaiqah, 2015) was solely a descriptive study that did not investigate outcomes associated with work environment. A few other studies looked at nurse outcomes such as nurse job satisfaction (Al-Ahmadi, 2002; Al-Ahmadi, 2009; Alasmari & Douglas, 2012; Zaghloul et al., 2008), nurse burnout (Al-Turki, 2010), and nurse intention to leave (Al-Ahmadi, 2009; Zaghloul et al., 2008) but not in association with nurse work environment. In addition, there was a qualitative study (Alotaibi et al., 2016) that explored Saudi nurses' perceptions of factors that affected their job satisfactory. This study identified five factors that affect Saudi nurses' job satisfaction: lack of educational opportunities and support, the poor image of the nursing profession, perceptions of favouritism, high workloads and a stressful work environment, and religion. I also located two Saudi studies that explored patient safety (Mwachofi et al., 2011; El-Jardali et al., 2014); but neither of these investigated the influence of nurse work environments on patient safety outcomes.

2.10 Chapter Summary

The relationships between nurse practice environment and nurse outcomes were extensively studied during the last three decades. Most of the studies demonstrated that more positive perceptions of the practice environment were associated with increased job satisfaction, lower levels of burnout (Aiken et al., 2002a,b; 2008a,b; Coetzee et al., 2013; Kutney-Lee et al., 2013; Liu et al., 2012; Nantsupawat et al., 2011) and decreased intent to leave (Aiken et al., 2012; Coetzee et al., 2013; Kutney-Lee et al., 2013; Liu et al., 2013; Kutney-Lee et al., 2013; Liu et al., 2012). There is also consistent evidence of a positive relationship between the quality of nurse work environments and nurse-perceived quality of care (Aiken et al., 2002a, 2008a,b, 2012; ; Coetzee et al., 2016; Nantsupawat et al., 2011; Van Bogaert et al., 2014). However, findings pertaining to the relationship between nurses practice environment and patient safety outcomes were less conclusive. Moreover, while some researchers measured work environment as a single score (Coetzee et al., 2013; Kutney-Lee et al., 2013; Liu et al., 201

2012), other researchers studied the effects of components of the work environment (Van bogaert et al., 2014). These mixed findings and methods suggest a need for the application of a theoretical foundation, greater methodological consistency, and clear conceptual and operational definitions of key constructs.

It should also be noted that although the relationship between nurse work environment and nurse and patients outcomes were well described in North American (e.g., Friese et al., 2008), Asian (e.g., Nantsupawat et al., 2011) and European contexts (e.g., Aiken et al., 2012), little is known about these relationships in the Middle Eastern region in general, and Saudi Arabia in particular. In Saudi Arabia, research focusing on the influence of the work environment on nurse and patient safety outcomes is relatively new. Moreover, as far as I know, the PES-NWI was not previously used in Saudi Arabia. Therefore, additional research is needed to explore relationships between the work environment and nurse and patient safety outcomes in Saudi Arabia, and whether these relationships are consistent with the relationships revealed in other cultures and contexts.

2.11 Proposed Conceptual Framework

Lake (2002) defined nursing practice environment as the "organizational characteristics of a work setting that facilitate or constrain professional nursing practice" (p. 178). The professional nursing practice environment model developed by Lake (2002) was based on characteristics of hospitals that were successful in attracting and retaining nurses during the nursing shortage crises in the United States in the early 1980s. This model identified five domains of nursing practice environment including nurse participation in hospital affair, nursing foundations for quality of care, nurse manager ability, leadership, and support of nurses, staffing and resource adequacy, and collegial nurse–physician relations. Adopting these characteristics in any organization will help to create and sustain practice environment that will facilitate professional nursing practice, enhance the quality of patient care, and improve outcomes for both nurses and patients (Lake, 2002). Thus, the five domains of professional nursing practice environment were used in this study as conceptually defined by Lake (2002), and each was hypothesized to influence each of the six outcomes identified in Figure 1, after controlling for nurse and patient characteristics.
Nurse Work Environment

- Staffing and Resource Adequacy
- 2 Nurse-Physician Relations
- 3 Nursing Leadership
- 4. Participation in Hospital Affairs
- 5. Nursing Foundation of Care Delivery

Nurse Outcomes

- Job Satisfaction
- 2. Burnout
- a Intent to Leave

Quality of Nursing Care

Control Variables

- Nurse Characteristics
- 2 Patient Characteristics

Patient Safety Outcomes

Overall Patient Safety
 Patient Adverse Events

Figure 2. 1. Conceptual Framework of the Study

Chapter 3: Methods

The purpose of this study was to examine relationships between components of nurse work environment and nurse outcomes, and nurse-perceived quality of care and patient safety outcomes in Saudi Arabia. The study aimed to answer the following questions:

- What are the relationships between components of nurse work environment and nurse outcomes (i.e. job satisfaction, burnout, and intent to leave) after controlling for nurse and patient characteristics?
- 2) What are the relationships between components of nurse work environment and nurse-perceived quality of care after controlling for nurse and patient characteristics?
- 3) What are the relationships between components of nurse work environment and nurse-perceived patient safety outcomes (i.e., overall patient safety and patient adverse events) after controlling for nurse and patient characteristics?

This chapter discusses study methods, beginning with a description of research design, sampling plan, access and recruitment methods. Data collection methods, measures, analytical procedures, and ethical consideration are also described.

3.1 Research Design

A descriptive correlational study design using cross-sectional data was employed to explore the relationships between nurse work environments and nurse and patient safety outcomes variables among a sample of registered nurses (RNs) (N=496) from one large tertiary hospital in Riyadh region, Saudi Arabia. This study has been informed by prior nurse forecasting research such as the European RN4CAST where a similar approach was used (Aiken et al., 2008a; 2012; 2013; Sermeus et al., 2011).

3.2 Study Setting and Sampling Plan

This study was conducted at a large tertiary hospital in Riyadh region—one of the oldest and largest medical cities located in the capital city of Saudi Arabia. It is a multi-specialty public hospital that offers a wide variety of general and specialty medical services through inpatient, outpatient, and emergency units, with approximately 44,000 patients'

admissions on a yearly basis. The hospital provides primary and secondary care free of charge to all Saudi citizens, and tertiary care for patients referred from other regional public hospitals. It is accredited by a number of accrediting bodies for international health care organizations. The selected hospital has an 860-bed capacity and 77% bed occupancy rate. It employs approximately 4,900 staff, including 2182 RNs, 95% of which are expatriate RNs and it is similar to other government hospitals in Saudi Arabia in terms of services provided and nursing workforce (L. Bell, personal communication, November 19, 2016). (See Appendix A for an overview of the healthcare system in Saudi Arabia and description of nursing education programs.)

The sample for this study was a convenience sample of registered nurses (RNs) working in a large tertiary hospital in Riyadh region, Saudi Arabia. All RNs who met the following inclusion criteria were included in the study: direct care nurse in inpatient or outpatient nursing units at the selected hospital; employed on the same unit for at least one year; diploma in nursing or higher nursing credential; and Saudi citizens or foreign educated nurses (expatriates). RNs who did not provide direct nursing care (e.g., head nurses, supervisors, and educators) or had nursing experience for less than 1 year were excluded from the study. Determining sample size for multiple logistic regression is more complex than determining the required sample size for multiple linear regression. Hosmer, Lemeshow, and Sturdivant (2013), therefore, recommend a minimum of 20 cases per predictor variable. To test a model with 10 predictors would, therefore, require 200 nurse participants. However, following the formula recommended by Peduzzi, Concato, Kemper, Holford, and Feinstein (1996) yielded a much larger required sample size of 400:

 $N = (10 * \text{number of predictor variables}) \div (expected proportion of positive cases}).$ $N = (10 * 10) \div 25\% = 400.$

Personal communication with the nursing director had indicated that this would be feasible given the high response rate (90%) achieved by other, similar studies at the medical city (L. Bell, personal communication, June 13, 2016). I targeted the entire RN population at the hospital, and were able to recruit a larger sample (N= 507) that also allowed for subgroup analysis (e.g. nurses who received their basic nursing education in the Philippines versus India). However, the final sample size was (N= 496) after excluding participants who had less than one year of nursing experience.

3.3 Access and Recruitment Methods

Access to the tertiary hospital was arranged through professional connections using email, Skype calls, and a face-to-face meeting in Riyadh with the Nursing Director. Summary of the study, including research purpose and questions, design, sampling plan, measures, data collection and data analysis plans, and a timeline, was sent to the Nursing Director which she subsequently shared with the Chief Medical Officer of the selected hospital. At the face-to-face meeting with the Director of Nursing, the Chief Medical officer, and a member of the Information Technology (IT) department in June 2016, logistics and feasibility were discussed, and verbal approval for the study was received from the Nursing Director and Chief Medical Officer. The research team was invited to apply for Institutional Research Board approval from the selected hospital after the ethics approval from the Behavioral Research Ethics Board (BREB) of the University of British Columbia is obtained. They have also agreed and signed a statement identifying the recruitment and data collection procedures described by the research team.

Following ethics approval from the Behavioral Research Ethics Board of the University of British Columbia, and Institutional Research Board at the selected hospital, a convenience sample of RNs was recruited. The nursing staff was informed about the study at Quarter meetings where purpose and implications for nursing were explained, and a brief overview of methods was provided. A poster providing general information about the study (see Recruitment Poster, Appendix B) was posted on nursing units of the tertiary hospital. An electronic version of the recruitment poster was also uploaded on computers screensavers of nursing units and also on advertisement screens throughout the hospital. Potential participants who were interested in taking part in the study were encouraged to contact the student researcher via phone or email if they require any further clarification. The study questionnaire was made available one week after the study information was posted on nursing units, and was open for a total of 10 weeks. Nurses received an invitation email, which provided details of the study and a link to the online questionnaire. This included eligibility criteria, potential risks and benefits, participants' privacy and confidentiality, incentives, and research team contact information. The invitation emails were sent out by the Nursing Director of the tertiary hospital through the internal email service, on behalf of the research team (See First Invitation Email, Appendix C). There were two reminder e-mails

sent out to RNs at 4 weeks and 8 weeks following the first invitation (See Second and Final Invitation Emails, Appendix C). As incentive, interested participants were entered in a raffle draw to win one of ten S100 worth gift cards as a mean of appreciation (this is the RNs' preferred incentive for survey studies, as recommend by the Nursing Director of the Saudi hospital). After the RN completed the online survey, the RN was invited to send an email to the principal investigator of research team to enter the raffle (see Cover Letter and Consent, Appendix D). However, personal information provided for the raffle was used solely to determine and contact the winners and was not linked in any way to the completed survey. These data were deleted within 60 days after the raffle was completed. Participation in the raffle was completely optional.

3.4 Data Collection Methods

The cross-sectional data were collected using an online survey hosted by the Saudi hospital. After the study questionnaire was finalized and required approvals were received, the study questionnaire was uploaded to the hospital server by the IT department. A link to the study was made available for prospective participants to complete online once the data collection period started. Participants were able to access the online survey for 7 weeks starting from August 1st, 2017. Two email reminder alerts were sent out to nurses at 4 weeks and 8 weeks following the first invitation to encourage participation. It was estimated that it would take respondents 20 to 25 minutes to complete the online survey.

Data collection through an online survey was recommended by the Nursing Director, as this method has been previously used at the hospital in a number of prior studies, with good response rates. There were several advantages to the use of online surveys. An online survey was more accessible to participating nurse, and quicker and less expensive to distribute than paper and pencil surveys given that data were collected from all RNs across all inpatient and outpatient units at the hospital (Ahem, 2005; Douglas et al., 2005; Hunter, 2012; Sue & Ritter, 2007). In addition, online survey data were exported directly into an Excel database, thus requiring less time and resources than manual entry. This is particularly advantageous when handling large dataset (Duffett et al., 2012). The chance of human errors that would affect data integrity and reliability was also reduced (Bryman, 2012; Jones, Murphy, Edwards, & James, 2008; Sue & Ritter, 2007). Still, there are mixed opinions in the

literature about the advantages and disadvantages of using on-line surveys. For example, some researchers have suggested that online surveys may be associated with increased risk of bias and lower response rate as compared to paper surveys (Couper & Miller, 2008; Scott et al., 2011; Sheenan, 2001). In contrast, others have argued that online anonymity enhances response rates and promotes honest answers due to the sense of social distance (Beling, Libertini, Sun, Masina, & Albert, 2011; Brindle, Douglas, Van Teijlingen, & Vanora, 2005; Wharton, Hampl, Hall, & Winham, 2003), which in turn, minimizes the risk of bias (McPeake, Bateson, & O'Neill, 2014).

During my visit to the Saudi hospital, I met with the Nursing Director and IT department to clarify the process of data collection, access, and extraction. There had also been email communication to discuss issues of confidentiality, and hospital administrators provided a statement indicating that no one at the hospital will view the data except for the purpose of transferring the data to the research team. Following the completion of data collection, the data were transferred securely by the hospital IT department to the research team in Canada using encrypted, password-protected external hard drive, and the data on the hospital server were destroyed.

3.5 Measures

The questionnaire employed in this study was comprised of standardized scales used in the RN4CAST survey (e.g., Aiken et al., 2008a) and other questions developed for the BC Nurses' Workload Impact Study (MacPhee et al., 2015). Examples of Scales from the RN4CAST include the Practice Environment Scale of the Nursing Work Index (PES-NWI) revised (Lake, 2002) and the Emotional Exhaustion (EE) subscale of the Maslach Burnout Inventory – Human Service Scale (MBI-HSS). Additional questions from the BC Nurses' Workload Impact Study include those related to patient characteristics such as "*Over the past month, on average, how would you rate your patients' dependency level*?". The present study used nurse-reported measures to assess nurses' perceptions of their work environments, nurse-outcomes (i.e., job satisfaction, burnout, and intent to leave), and nurses' perceptions of quality of care and patient safety. (See Summary of Concepts and Operational Definitions, Appendix E).

English is the primary language in health care education and services across Saudi

Arabia, and inter-disciplinary communication and documentation are done in English. Therefore, data were collected using English language survey that included the following measures (see Study Survey, Appendix D).

3.5.1 Nurse work environment.

For the purpose of this study, the concept of nurse work environment was defined as organizational attributes of "work settings that facilitate or constrain professional nursing" practice" (Lake, 2002, P. 178). Nurses' perceptions of their work environment were measured using the Practice Environment Scale of the Nursing Work Index (PES-NWI) revised (Lake, 2002). The PES-NWI is a 31-item scale that measures five dimensions of nurse practice environment: Nurse participation in hospital affairs (9 items); nursing foundations for quality of care (10 items); nurse manager ability, leadership and support of nurses (5 items); staffing and resource adequacy (4 items); and collegial nurse-physician relationships (3 items). Nurses were asked to rate their perceptions of their current work environment on a four-point scale ranging from 1 = strongly disagree to 4 = strongly agree. Examples of items from each subscale (in order) are: "opportunity for staff nurses to participate in policy decisions;" "provision of active continuing education programs for staff nurses;" "supervisors use mistakes as learning opportunities, not criticism;" enough registered nurses to provide quality patient care;" and "a lot of teamwork between nurses and physicians". Mean subscale scores were computed with higher scores indicating a higher quality work environment.

The PES-NWI is the most widely accepted instrument for measuring nurse work environment. It has been used in multiple nursing studies and settings across the United States (Aiken et al., 2008a; Boev, 2012; Flynn, Liang, Dickson, Xie, & Suh, 2012; Gardner et al., 2007; Lake et al., 2016; Manojlovich, 2005; McHugh & Lake, 2010; Stone et al., 2007). It has also been widely used and accepted outside the U.S. (Kirwan et al., 2013; Warshawsky & Havens, 2011), for example, in Germany (Zander, Dobler, & Busse, 2013), China (Liu et al., 2012), and South Africa (Coetzee et al., 2013). Additionally, the PES-NWI has been endorsed and adopted by many agencies as a nurse-sensitive indicator of quality, including the National Database of Nursing Quality Indicators (NDNQI) and the National Quality Forum (NQF) (Lake, 2007; McHugh & Lake, 2010; NQF, 2004). In previous research, the PES-NWI subscales yielded Cronbach's alphas ranging from 0.71 to 0.84 (Lake, 2002). The predictive validity of the PES-NWI has been established in multiple international nursing settings in relation to nurse outcomes (Aiken et al., 2012; Warshawsky & Havens, 2011) and its subscales have been shown to have high predictive validity in relation to workforce stability and hospitals' quality of care (Aiken et al., 2008a; Bruyneel et al., 2009). In the present study, reliability coefficients (Cronbach's alpha) for the five subscales ranged from .76 to .90 indicating a satisfactory evidence of internal consistency (see table 3.1). According to George and Mallery (2003)'s guidelines, reliability coefficients that are more than .9 are "Excellent", those that are more than .8 are "good" and those that are more than .7 are "acceptable".

Table 3.1. Reliability Indices for the Practice Environment Scale of the Nursing Work Index(PES-NWI)

Subscale	Number of Items	Cronbach's Alpha (<i>N</i> = 496)
Nurse Participation in Hospital Affairs	9	.90
Nursing Foundations for Quality of Care	10	.90
Nurse Manager Ability, Leadership, and Support of Nurses	5	.84
Staffing and Resource Adequacy	4	.76
Collegial Nurse–Physician Relations	3	.76

3.5.2 Nurse outcomes.

Nurse outcomes were measured using nurse-reports of (a) overall job satisfaction, (b) burnout-emotional exhaustion, and (d) intent to leave.

Nurse Job satisfaction. Many established measures of nurses' job satisfaction have items that overlap with concepts and items of the PES-NWI. Therefore, to avoid conflation between the predictor and outcome measures, job satisfaction was measured with a singleitem that asked nurses to identify their overall satisfaction with their current job. The question was answered on a 6-point Likert scale (1= very dissatisfied, 2= moderately dissatisfied, 3= slightly dissatisfied, 4= slightly satisfied, 5= moderately satisfied, 6= very satisfied). Scores were dichotomized as *very dissatisfied to slightly satisfied* (0) versus *moderately or very satisfied* (1).

Several prior studies adopted a single-item measure to assess overall nurse job satisfaction (e.g., Aiken et al., 2002a,b; 2008a,b; 2012; Coetzee et al., 2013; Kutney-Lee, et al., 2013; Liu et al., 2012; MacPhee et al., 2015; Nantsupawat et al., 2011).

Burnout – Emotional Exhaustion. In the current study nurses' burnout was measured using the Emotional Exhaustion (EE) subscale of the Maslach Burnout Inventory – Human Service Scale (MBI-HSS) (Maslach et al., 1996). The EE subscale includes nine items such as "*I feel emotionally drained from my work*". In the current study, nurses were asked to indicate how frequently they experience each item, using a 6-point response scale ranging from 1= never to 6= every day. Scores were interpreted based on the established normative criteria for medical workers which indicate that scores equal to or greater than 27 on EE scale are suggestive of high level of burnout (Maslach et al., 1996). Scores were dichotomized as (0) *low burnout* with scores ranging from 0 to 26 versus (1) *high burnout* with scores that are equal or more than 27 on the EE scale.

The EE emotional exhaustion subscale of the MBI-HSS is the most widely used measure of job-related burnout (Aiken et al., 2011b, Coetzee et al., 2013; Kutney-Lee, et al., 2013; Liu et al., 2012; MacPhee et al., 2015; Nantsupawat et al., 2011; Sermeus et al., 2011). Maslach and colleagues (1996) estimated the reliability of the MBI-HSS subscales through the use of a criterion of .80 Cranach's alpha (N=1,316), which showed satisfactory internal consistency and reliability of the all subscales. The reliability coefficient for the EE subscale was .71. Test-retest reliability was also tested and demonstrated high degree of subscales stability that did not decrease radically over a period from one month to a year. Factorial validity was based on repeated confirmatory factor analysis, and evidence of convergent and discriminate validity was established (Maslach et al., 1996). More recent study provided evidence supporting the reliability and validity of the MBI-HSS (Poghosyan, Aiken, & Sloane, 2009). Poghosyan and colleagues validated the three-factor structure of the MBI among a sample of direct care professional nurses (N=54,738) in a large multi-country study and indicated that it can be employed with confidence to measure nurses' burnout internationally. In this study, internal consistency was acceptable with Cronbach's alpha value of .79 for the emotional exhaustion subscale.

Nurse intent to leave. Nurses' intention to leave their position was measured using a single-item question asking nurses to report whether they would leave their current job in the hospital within the next year. The question was answered on a 4-point Likert scale (1= very unlikely, 2= somewhat unlikely, 3= somewhat likely, and 4= very likely). These scores were then dichotomized to (0) *very unlikely to somewhat unlikely* versus (1) *somewhat likely or very likely*.

This measure of nurse intent to leave have been widely used in nursing literature to assess nurses' intention to leave their current job (Aiken et al., 2008a; 2012; Coetzee et al., 2013; Kutney-Lee, et al., 2013; Liu et al., 2012; MacPhee et al., 2015; Nantsupawat et al., 2011).

3.5.3 Quality of nursing care and patient safety.

Quality nursing of care and patient safety outcomes were assessed by asking nurses about their perceptions of (a) overall quality of care, (b) overall patient safety (c) and the occurrences of patient adverse events on their unit.

Nurse-perceived quality of care. Nurses were asked to rate the quality of care they delivered to patients on their units. This single question was rated on 6-point Likert scale (1= very poor, 2= poor, 3= fair, 4= good, 5= very good, 6= excellent). Scores were then dichotomized as (0) *very poor to good* versus (1) *very good or excellent*.

Nurse-perceived patient safety. Nurses was asked to rate patient safety on their units, using a 6-point Likert scale (1= very poor, 2= poor, 3= acceptable, 4= good, 5= very good, 6= excellent).

This single item was derived from the Agency of Healthcare Research and Quality (AHRQ, 2004) Hospital Survey on Patient Safety Culture. Scores were dichotomized as (0) *very poor to good versus* (1) *very good or excellent*.

Patient adverse events. Nurses were provided with a list of three possible adverse events incidents: *Patient received wrong medication, time or dose, Patient developed pressure ulcers after admission, and Patient falls with injury,* and were asked to indicate how often each of these incidents have occurred to patients on their primary unit during the past year, using a 6-point response scale ranging from 0= very rarely or never to 6= every day.

These three items were derived from the American Nurses Association of nursing quality indicators and used in Sochalski's (2001) study of nurse staffing, quality of care and patient outcomes. Prior studies have indicated that nurse-reported measures of frequency of adverse events were related to measures of quality of care (Lucero et al., 2010). An aggregated score for patient adverse events was computed, with possible scores ranging from 0 to 18.

3.5.4 Control Variables

Demographic characteristics. Participants' demographic characteristics were measured using ten researcher-developed questions about age, years of nursing experience, gender (0= male, 1= female), nationality (0= Saudi, 1=non-Saudi), Marital status (0= single, 1=married) and country where nursing education where received (1=Philippines, 2=India, 3=Saudi or other). Nurses were also asked to identify their highest educational qualification, current professional designation such as nurse specialist or technician, primary nursing role, and area of nursing practice.

Patient characteristics: Two additional questions were asked to identify patient acuity and dependency levels as these are factors that contribute to nursing workload. Acuity referred to amount of skilled nursing care required. Nurses were asked to rate their patients' average acuity level during the last month, using a 5-point scale ranging from 1= not at all acute to 5= very acute. These scores were dichotomized as (0) *less than moderately acute versus* (1) *moderately or very acute.*

Dependency refers to amount of support required for activities of daily living. One question was asked about their patients' average dependency level during the last month, using a 5-point scale ranging from 1= very independent to 5= very dependent. Scores were then dichotomized as (0) *less than moderately dependent* versus (1) *moderately or very dependent*.

3.6 Analytic Plan

Data were provided to the principal investigator in the form of an Excel spread sheet, and imported into a password-protected SPSS database. Data were cleaned using frequency listings and logic checks. The amount of missing data was assessed and no action was taken as the missing data amounted to less than 10% of cases per variable, and the sample size was sufficiently large for .80 power and a small-moderate effect size. The distribution of key study variables was examined using histograms, normality plots, as well as skewness and kurtosis indices. Data were non-normally distributed with most of the scores being slightly negatively skewed. However, skewness indices were less than twice the values of its standard error indicating a modest deviation from normality. In addition, with adequate sample size (200+ respondents), skewness will not make "a substantive difference in the analysis" (Tabachnick & Fidell, 2013, p. 80), therefore, no transformations were done.

Scatterplots were also generated to examine the relationships between pairs of study variables and also to assess the assumptions of linearity, homoscedasticity, and homogeneity of the variance. Due to some violations of correlations assumptions as well as the presence of variables measured on an ordinal level of measurement, a decision was made to report non-parametric statistics.

Descriptive statistics (means, standard deviations, frequencies and percentages) were computed to describe the sample characteristics and key study predictors including nurses' perceptions of their work environment, years of nursing experience, marital status, country of receiving nursing educating, patient acuity and dependency levels. Nurse outcomes, quality of nursing care, and patient safety outcomes were also characterized using descriptive statistics. Bivariate analyses using Spearman rho correlations were conducted to determine associations between pairs of key study variables. Chi-square analysis was also performed to examine between-group differences in practice environments, nurse outcomes, and nurseperceived quality care and patient safety outcomes across three different subgroups of nurses, those who received their basic nursing education in the Philippines versus India and Saudi Arabia or others.

A series of hierarchical logistic regressions were used to investigate the impacts nurse practice environment components have on nurse outcomes (Research Question 1), and nurseperceived quality of care (Question 2) and patient safety outcomes (Questions 3). Logistic regression allows for the investigation of the relationships between several independent variables and one dependent variable using a maximum likelihood model of estimation which has less restrictive assumptions compared to a least square method of estimation (Polit, 2010). Logistic regression only assumes the error terms to be independent, and a linear relationship between continuous predictor variable and log odds of the dependent variable (linearity to the logit). However, multicollinearity and outliers should also be avoided (Polit, 2010). These assumptions were examined and found to be sufficiently met in most of the aspects. Diagnostic tests indicated a few problems with respect to multicollinearity and linearity to the logit assumptions were found and dealt with as appropriate. For example, age (control variable) was excluded from all logistic regression analyses due to its high correlation with another nurse characteristics (i.e., years of nursing experience), rho = .86, p < 0.01, and its non-significance in preliminary regression results. Two subscales of the key predictor variable (PES-NWI), participation in hospital affairs and collegial nurse-physician relationships, were also eliminated from the final regression analyses as an examination of diagnostic tests indicated violation of the "linearity to the logits" assumption which would increase the risk of type II error (Polit). Moreover, bivariate correlations and regression coefficients of the two subscales with some of the study outcomes had opposite signs indicating a suppression effect.

Five hierarchical logistic regression analyses were conducted in this study to test the impact of components of nurse work environment on nurse outcomes (i.e., (1) job satisfaction, (2) burnout, and (3) intent to leave), (4) nurse-perceived quality of care, and (5) nurse-perceived patient safety after accounting for nurse (i.e., years of nursing experience, marital status and country where nursing education received) and patient characteristics (i.e., patient acuity and dependency levels). To decrease the risk of type I error and achieve a parsimonious regression model with strong predictive power, it is preferred to only select a small number of "good" predictor variables (Polit, 2010). Therefore, only 5 predictors that have been identified in the literature to have an effect on the dependent variable of interest were included and controlled for by entering them first in the model followed by key study predictors.

Each logistic regression consisted of three models, with variables entered as follows; nurse characteristics including marital status, years of nursing experience, and country where nursing education was received (Model 1), patient characteristics including patient acuity and patient dependency levels (Model 2), and three components of nurse work environment as measured by the PES-NWI: Nursing Foundation for Quality of Care, Nurse Manager Ability and Leadership Support of Nurses, and Staffing and Resource Adequacy (Model 3). The PES-NWI subscales were entered in the last model in order to identify their unique effects over and above the effect of nurse and patient characteristics.

For each hierarchical logistic regression analysis, the Omnibus Tests for Model coefficients were examined and reported. The result of this test, which is usually referred to as "goodness of fit" provides an overall indication of how well my model, with the set of predictor variables, performed. Negelkerke R^2 was also examined to determine the magnitude of the relationships between the outcome and the set of predictors in the model. Values of Odds Ratios were also examined for each individual predictor. These values provide a direct measure of effect size indicating "the change in odds of being in one of the categories of outcomes when the value of a predictor increases by one unit" (Tabachnick & Fidell, 2013, p. 461). Sensitivity and specificity of the model (i.e., the percentage of positive and negative cases correctly categorized by the model, respectively) was also examined and reported. However, the classification success of statistically reliable model is not necessarily good with a large sample size (Polit, 2010).

An alpha of .05 level were used as the criterion for determining statistical significance. All data were analyzed using IBM SPSS 23 statistical software (IBM Corp. Armonk, NY).

3.7 Ethical Considerations

Approvals were sought from the Behavioral Research Ethics Board of the University of British Columbia, and Institutional Research Board of the Saudi hospital prior to data collection. Recruitment and information letters included adequate information about the research in a format that was easy to read and understand including a brief background of the study, estimated time to complete the survey, privacy and confidentiality, potential risks and benefits associated with participation, and research incentives. Potential respondents were advised that their participation is voluntarily and that they have the right to withdraw at any time with no penalty. They were made aware that submission of the online questionnaire indicates their consent to participate.

There were no personal identifiers on the completed surveys. Participants did not use email addresses to access the surveys, but were able to directly access the online questionnaire hosted by the IT department server of the Saudi hospital. In addition, hospital administrators provided a statement indicating that no one at the hospital will view the data (except for the purpose of transferring the data to the research team). The personal information used for raffle drawing were used solely to determine and contact the winners. These data were not linked in any way to completed surveys and were deleted within 60 days after the raffle was completed.

Data were stored in a password-protected and encrypted research computer in the PI's research office located at the UBC School of Nursing and on a password-protected, encrypted laptop computer used by the student researcher. Data files were accessible only to the research team identified in the applications for ethical approval. All related physical documents (i.e., the aggregated, computer output) were kept in a locked cabinet in the PI's research office located at the University of British Columbia, School of Nursing. Electronic and computer output will be destroyed after 5 years following completion of the study as per UBC guidelines.

Chapter 4: Findings

This chapter presents the findings of a study examining the impact of nurse work environment on nurse and patient outcomes. The study findings are discussed in three key sections. In the first section, descriptive statistics of the study sample, key predictors and outcome variables are reported. The second section presents results of bivariate analyses: correlations between key variables and between-group differences in study outcomes. Findings of hierarchical logistic regression analyses for the five outcome variables are presented in the third section, followed by a summary of the logistic regression analyses with respect to each research question.

4.1 Descriptive Statistics

Table 4.1 presents the demographic characteristics of the final sample which included 496 registered nurses who provide direct patient care and have a minimum of one year of nursing experience. The majority of the nurses (89.3%) were female, with a mean age of 34 years (SD = 7.5) years and 11 years (SD = 6.4) of nursing experience. More than half (57.9%) were married. As expected, almost all the nurses (99.2%) were expatriates: 60.8% of them received their basic nursing education in the Philippines and 33.5% were educated in India. Ninety-four percent of the nurses were classified as nurse technicians (i.e., those who have a nursing diploma or 3-year degree program) and more than half (65.7%) have earned a bachelor's degree in nursing science. The nurses worked in various practice areas, with 43.4% working in medical and/or surgical units and 31.9% in critical care, intensive care or emergency. These demographics were typical in representing the nursing workforce in Saudi Arabia.

Characteristics	Maar (CD)	Frequency		
	Mean (SD)	n	%	
Age	34.0 (7.5)			
Years of nursing experience	10.9 (6.4)			
Gender				
Male		52	10.7	
Female		436	89.3	
Marital status				
Married		282	57.9	
Single		205	42.1	
Nationality				
Saudi		4	0.8	
Non-Saudi		491	99.2	
Country where nursing education received				
Saudi Arabia		3	0.6	
Other Middle Eastern Country		3	0.6	
Philippines		299	60.8	
India		165	33.5	
Other		22	4.5	
Professional classification				
Nurse technician ^a		462	94.1	
Nurse specialist ^b		29	5.9	
Educational qualification				
Diploma in nursing (2 years)		2	0.4	
High-diploma in nursing (3 years)		158	32.0	
Baccalaureate degree in nursing (BSN-RN)		324	65.7	
Master's degree		9	1.8	
Area of nursing practice				
Ambulatory Care		52	10.6	
Critical Care, Intensive Care		119	24.3	
Emergency		37	7.6	
Medical		59	11.9	
Medical-Surgical		50	10.2	
Surgical		104	21.3	
Oncology		16	3.3	
Operating Room, Recovery		4	0.8	
Women's Health and Pediatrics		44	9.0	
Other		4	0.8	

Table 4.1. Demographic Characteristics of Participants (N = 496)

Note. ^aNurses who hold up to 3 years of nursing diploma. ^bNurses who hold a nursing degree (BSN or higher qualifications).

Descriptive characteristics for key variables are shown in Table 4.2. On average, each of the five components of nurse work environment as measured by the (PES-NWI) were scored positively by the study participants. The two subscales that received the highest mean scores were nursing foundation for quality of care (M = 3.33, SD = 0.51) and collegial nurse-physician relationships (M = 3.12, SD = 0.59)¹. Mean scores below 3.0 were obtained for nurse manager ability and leadership (M = 2.93, SD = 0.67); staffing and resource adequacy (M = 2.85, SD = 0.67); and nurse participation in hospital affairs (M = 2.83, SD = 0.63). Participants also reported the average acuity and dependency levels of their patients. Almost 60% of the nurses assessed their patients' acuity levels as moderately or very acute (58.3%); whereas only 52.0% of the nurses assessed their patients' dependency levels as moderately or very acute.

Table 4.2 also shows the descriptive statistics for nurse and patient outcomes. Although 64.4% of the nurses reported being moderately or very satisfied with their jobs, 42.6% reported experiencing high burnout (i.e., with scores of 27 or more), and 56.1% reported being somewhat to very likely to leave their current jobs within the next year. In regard to patient outcomes, the majority of nurses reported that patient safety and quality of care were very good to excellent (78.5% and 74.2%, respectively).

Table 4.3 presents the frequencies of nurse-perceived adverse patient events. The majority of the nurses indicated that the occurrence of adverse events in their units was rare. For example, only 4.5% of nurses indicated that medication errors occurred more than a few times a year, and only 3.9% of nurses reported that patient falls with injury happened more than a few times a year. Due to the very low reported frequencies, these variables were not used in any further analyses. Problems with under-reporting of adverse events is acknowledgeable in many previous studies (Scott et al., 2013).

¹ The possible range of mean scores for each subscale is 1 (strongly disagree) to 4 (strongly agree).

Predictors	Mean (SD)	Frequency		
	(DD)	n	%	
Nurse Participation in Hospital Affairs (PES-NWI)	2.83 (0.63)			
Nursing Foundation for Quality of Care (PES-NWI)	3.33 (0.51)			
Nurse Manager Ability, Leadership and Support of Nurses (PES-NWI)	2.93 (0.67)			
Staffing and Resource Adequacy (PES-NWI)	2.85 (0.67)			
Collegial Nurse-Physician Relationships (PES-NWI)	3.12 (0.59)			
Patient acuity				
Less than moderately acute		202	41.7	
Moderately or very acute		282	58.3	
Patient dependency				
Less than moderately dependent		233	48.0	
Moderately or very dependent		252	52.0	
Outcomes				
Job satisfaction				
Very dissatisfied to slightly satisfied		174	35.6	
Moderately or very satisfied		315	64.4	
Emotional exhaustion				
Low or medium burnout		264	57.4	
High burnout		196	42.6	
Intent to leave				
Very unlikely to somewhat unlikely		214	43.9	
Somewhat likely or very likely		274	56.1	
Quality of care				
Very poor to good		127	25.8	
Very good or excellent		366	74.2	
Patient safety				
Very poor to good		106	21.5	
Very good or excellent		386	78.5	

Table 4.2. Descriptive Statistics for Key Predictors and Outcome Variables (N = 496)

Incidents	Frequen	cy
	n	%
Wrong medication, time, or dose		
Very rarely or never	420	86.6
A few times a year	43	8.9
More than a few times a year	22	4.5
Pressure ulcers after admission		
Very rarely or never	298	61.4
A few times a year	136	28.0
More than a few times a year	51	10.5
Patient falls with injury		
Very rarely or never	392	80.8
A few times a year	74	15.3
More than a few times a year	19	3.9

Table 4.3. Descriptive Statistics for Adverse Patient Events (N = 496)

4.2 Bivariate Analyses

The inter-correlations between key study variables were investigated using Spearmen's Rank-orders Correlation analyses (see Table 4.4). Strengths of the relationships are interpreted according to (Cohen, 1988)'s guidelines: correlation coefficients ranging from .10 to .29 are "small", those ranging from .30 to .49 are "medium", and those ranging from .50 to 1.0 are "large" (p. 77- 81).

The correlations between the five PES-NWI subscales were all high ranging from .51 to .75. All PES-NWI subscales were also significantly correlated to all study outcomes, except for scores of the nursing foundation for quality of care subscale and intent to leave. The correlations ranged in direction and magnitude but all were within the expected direction.

More positive scores on the participation in hospital affairs subscale were moderately associated with lower emotional exhaustion, $r_s = -.30$, p < .01, and increased job satisfaction, $r_s = .37$, p < .01. Low inverse correlation was found between participation in hospital affairs

and intent to leave ($r_s = -.19$, p < .01). Low positive correlations were found between participation in hospital affairs and patient safety ($r_s = .17$, p < .01), and quality of care ($r_s = .17$, p < .01).

Moderate positive correlations were found between nursing foundation for quality of care and job satisfaction ($r_s = .35$, p < .01) and quality of care ($r_s = .32$, p < .01). Small relationships were found between more positive scores of nursing foundation for quality of care and lower levels of emotional exhaustion ($r_s = .21$, p < .01) and higher rates of patient safety ($r_s = .29$, p < .01). No statistically significant correlation was found between nursing foundation for quality of care and intent to leave.

More positive scores of nurse manager ability and leadership was moderately associated with increased nurse job satisfaction ($r_s = .38, p < .01$) whereas small relationships were found between more positive scores of nurse manager ability and lower levels of emotional exhaustion ($r_s = -.21, p < .01$), decreased intent to leave ($r_s = -.13, p < .01$), and higher levels of patient safety ($r_s = .19, p < .01$) and quality care ($r_s = .18, p < .01$).

More positive scores of staffing and resource adequacy were moderately associated with lower levels of emotional exhaustion ($r_s = -.34$, p < .01) and increased job satisfaction ($r_s = .36$, p < .01). Small relationships were found between more positive scores of staffing and resource adequacy and decreased nurse intent to leave ($r_s = -.18$, p < .01), and higher rates of patient safety ($r_s = .26$, p < .01) and quality care ($r_s = .27$, p < .01).

Small relationships were found between more positive scores on the collegial nursephysician relationships subscale and lower levels of emotional exhaustion ($r_s = -.19, p < .01$), increased job satisfaction ($r_s = .23, p < .01$), decreased nurse intent to leave ($r_s = -.13, p < .01$), and higher rates of patient safety ($r_s = .22, p < .01$), and quality care ($r_s = .23, p < .01$).

In regard to control variables, small and significant correlations were found for marital status and years of experience with all study outcomes. For example, married participants reported higher levels of burnout, increased job satisfaction, and decreased intent to leave ($r_s = .17, p < .01, r_s = .21, p < .01, r_s = .10, p < .01$, respectively) whereas nurses with more years of nursing reported lower levels of burnout, increased job satisfaction, and decreased intent to leave ($r_s = .12, p < .01, r_s = .18, p < .01, r_s = .12, p < .01$). Correlations between patient characteristics and study outcomes were not significant expect for patient

acuity level and quality of care ($r_s = -.12, p < .01$) and patient dependency level and emotional exhaustion ($r_s = -.10, p < .05$).

St	udy variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Marital status ^a	-	_	_	_	-	-	-	-	_	-	-		-
2.	Years of nursing experience	.56**	-	-	-	-	-	-	-	-	-	-		-
3.	Patient acuity ^b	.16**	.18**	-	-	-	-	-	-	-	-	-		-
4.	Patient dependency ^c	.10*	.02	.25**	-	-	-	-	-	-	-	-		-
5.	Nurse Participation in Hospital Affairs (PES-NWI)	.12**	01	.01	.01	-	-	-	-	-	-	-		-
6.	Nursing Foundation for Quality of Care (PES-NWI)	.34**	.22**	.16**	.12**	.62**	-	-	-	-	-	-		-
7.	Nurse Manager Ability, Leadership and Support of Nurses (PES-NWI)	.14**	.06	.06	.03	.75**	.54**	-	-	-	-	-		-
8.	Staffing and Resource Adequacy (PES-NWI)	.22**	.05	.06	.01	.66**	.55**	.57**	-	-	-	-		-
9.	Collegial Nurse-Physician Relationships (PES-NWI)	.19**	.15**	.12**	.03	.59**	.66**	.57**	.51**	-	-	-		-
10	. Job satisfaction ^d	.21**	.18**	.08	-0.01	.37**	.35**	38**	.36**	.23**		-		
11	. Emotional exhaustion ^e	-17**	12*	09	.10*	30**	21**	21**	34**	19**	33**	-		-
12	. Intent to leave ^f	10*	12**	07	00	19**	23	13**	18**	13**	26**	.25**	-	-
13	. Quality of care ^g	.17**	.15**	.12**	.07	.17**	.32**	.18**	.27**	.23**	.29**	23**	-10*	-
14	. Patient safety ^h	15**	.11*	.08	.08	. 17**	. 29**	.19**	.26**	.22**	.23**	22**	12*	.67**

Table 4.4. Correlations between Key Study Variables

Note. ^a 0 = Single, 1 = Married; ^b 0 = Less than moderately acute, 1 = Moderately or very acute; ^c 0 = Less than moderately dependent, 1 = Moderately or very dependent; ^d 0 = Very dissatisfied to slightly satisfied, 1 = Moderately or very satisfied; ^e 0 = Low or medium burnout, 1 = High burnout; ^f 0 = Very unlikely to somewhat Unlikely, 1 = Somewhat likely or very likely; ^g 0 = Very poor to good, 1 = Very good or excellent; ^h 0 = Very good or excellent; ^h 0 = Very poor to good, 1 = Very good or excellent; ^h 0 =

Chi-square analyses were conducted to examine group differences in outcome variables based on the country where participants received their nursing education. The analyses were initially run on three groups: nurses educated in the Philippines, India, and Saudi or other countries.² However, due to the small subsample of nurses educated in Saudi or other countries (n = 28), chi-square analyses were re-run, excluding the third group. Table 4.5 shows that nurses educated in the Philippines versus India differed significantly on all nurse and patient outcomes. In terms of nurse outcomes, Filipino nurses were significantly more likely (45.3%) than those from India (20.4%) to report being very dissatisfied or only slightly satisfied in their current jobs ($\chi^2 = 26.96$, p < 0.001). Filipino nurses were also significantly more likely (49.7%) than those from India (28.2%) to report experiencing high burnout (χ^2 = 17.05, p < 0.001) and intending to leave their current jobs in the next year (64.7% vs 42.6%, $\chi^2 = 20.03$, p < 0.001). In terms of patient outcomes, Indian nurses were significantly more likely (87.7%) than those from the Philippines (66.8%) to rate overall quality of care as very good or excellent, $\gamma^2 = 23.07$, p < 0.001. Indian nurses were also more likely (86.5%) than those from the Philippines (73.1%) to rate overall patient safety as very good or excellent, $\chi^2 = 10.25$, p < 0.01.

In addition to an examination of differences in outcomes by country of nursing education, *t*-tests were run to explore differences between countries for the five PES-NWI subscales. For each of the subscales, Indian-education nurses reported higher scores than nurses educated in the Philippines at p < .01 for the Nurse Manager subscale and p < .001 for the other four subscales.

² These results are reported in Appendix F.

Outcomes	Philippines (n = 299)	India (<i>n</i> = 165)	
Outcomes	n (%)	n (%)	χ^2
Job satisfaction			
Very dissatisfied to slightly satisfied	134 (45.3)	33 (20.4)	26.96*** (1, 458)
Moderately or very satisfied	162 (54.7)	129 (79.6)	
Emotional exhaustion			
Low or medium burnout	144 (50.3)	102 (71.8)	17.05*** (1, 428)
High burnout	142 (49.7)	40 (28.2)	
Intent to leave			
Very unlikely to somewhat unlikely	104 (35.3)	93 (57.4)	20.03*** (1, 457)
Somewhat likely or very likely	191 (64.7)	69 (42.6)	
Quality of care			
Very poor to good	99 (33.2)	20 (12.3)	23.07*** (1, 461)
Very good or excellent	199 (66.8)	143 (87.7)	
Patient safety			
Very poor to good	80 (26.9)	22 (13.5)	10.25** (1, 460)
Very good or excellent	217 (73.1)	141 (86.5)	

 Table 4.5. Between Group Differences in Outcome Variables based on Country

Note. ***p* < 0.01, ****p* < 0.001.

4.3 Hierarchical Logistic Regression Analyses

Hierarchical logistic regression analysis was conducted separately for each of the five outcome variables.³ Age was excluded from all regression analyses due to its high correlation with years of nursing experience ($r_s = .86$, p < 0.01), and its non-significance in preliminary regression results. Two components of nurse work environment measured by the PES-NWI, nurse participation in hospital affairs and collegial nurse-physician relationships subscales, were also excluded from the final regression analyses as an examination of diagnostic tests indicated violation of the "linearity to the logits" assumption, which is considered a serious

³ Regression analysis was not conducted on adverse patient events (one of the patient safety outcomes - research question 3) due to their low reported frequencies and questionable reliability.

violation leading to inaccurate statistical conclusions (Field, 2013). Each logistic regression consisted of three models to answer the research questions, with variables entered as follows:

Model 1: Three nurse characteristics: marital status, years of nursing experience, and country where nursing education was received. All nurse characteristics demonstrated significant bivariate correlations with each of the three nurse outcomes and two patient outcomes.

Model 2: Two patient characteristics: patient acuity and patient dependency levels which demonstrated significant correlations with at least one of the outcome variables. These were retained in the regression analyses, as prior research evidence has also shown significant relationships between these characteristics and the outcome variables in this study.

Model 3: Three components of nurse work environment as measured by the PES-NWI: nursing foundation for quality of care, nurse manager ability and leadership support of nurses, and staffing and resource adequacy.

Hierarchical logistic regression results are reported separately by outcome variable, in Tables 4.7, 4. 8, 4.9, 4.10 and 4.11, followed by a summary of the logistic regression analyses with respect to each research question.

4.3.1 Nurse outcomes: job satisfaction (Question 1).

Logistic regression results for job satisfaction are shown in Table 4.6. None of the nurse or patient characteristics were statistically significant except for country, where receiving basic nursing education in India was found to be a significant predictor of higher job satisfaction in all three models.

Results of model 3 showed that after accounting for nurse and patient characteristics, two components of nurse work environment (nurse manager ability and leadership support for nurses and staffing and resource adequacy) made statistically significant contributions to the model, with similar strength. The odds ratios were 2.11, 95% CI [1.41, 3.17] for nurse manager ability and 2.10, 95% CI [1.38, 3.18] for staffing and resource adequacy. This means that for every one unit increase in scores for these two components (i.e., ability/leadership support of nurse manager and staffing/resource adequacy), nurses were almost twice as likely to report higher levels of job satisfaction. In other words, nurses are

more satisfied with their job when nurse managers have strong abilities and leadership and when there are adequate resources and staffing. Nursing foundation for quality of care (PES-NWI) was not found to be statistically significant after accounting for nurse and patient characteristics. The final model, model 3, was statistically significant, χ^2 (9) = 100.19, *p* < 0.001, indicating that the model was able to distinguish between respondents who were very dissatisfied to slightly satisfied and those who were moderately or very satisfied. The Nagelkerke R² of 27.2% provides an indication of the moderate substantive significance of the model (Field, 2013), though some authors interpret this pseudo *R* squared statistic as the proportion of the variance in the outcome measure that is explained by the predictor variables (e.g., Pallant, 2013). The model correctly classified 88.6% of the cases who were moderately or very satisfied and 74.1% of the cases overall.

Predictor variables	Model 1	Model 2	Model 3
Treater variables	<i>OR</i> [95% CI]	<i>OR</i> [95% CI]	<i>OR</i> [95% CI]
Marital status ^b	1.17 [0.70, 1.94]	1.18 [0.71, 1.97]	0.91 [0.52, 1.60]
Years of nursing experience	1.03 [0.99, 1.08]	1.03 [0.99, 1.08]	1.04 [0.10, 1.09]
Country where nursing education Received ^c			
India	2.48** [1.43, 4.29]	2.47** [1.39, 4.39]	2.02* [1.08, 3.79]
Saudi or Other	2.07 [0.70-6.09]	2.07 [0.70, 6.15]	2.54 [0.78, 8.28]
Patient acuity ^d		1.08 [0.70, 1.66]	1.08 [0.67, 1.72]
Patient dependency ^e		0.89 [0.59, 1.36]	0.92 [0.58, 1.44]
Nursing Foundation for Quality of Care [PES- NWI]			1.25 [0.70, 2.24]
Nurse Manager Ability, Leadership and Support of Nurses [PES-NWI]			2.10 ** [1.38, 3.18]
Staffing and Resource Adequacy [PES-NWI]			2.11*** [1.41, 3.17]
Nagelkerke R^2	10.1 %	10.2%	27.2 %
Correct classification	66.0%	65.1%	74.1%
Specificity (less than moderately satisfied)	3.8%	6.3%	47.2%
Sensitivity (moderately or very satisfied)	99.3%	96.6%	88.6%

Table 4.6. Results of Hierarchical Logistic Regressions for Job Satisfaction a (N = 456)

Note. ^a 0 = Very dissatisfied to slightly satisfied, 1 = Moderately or very satisfied; ^b 0 = Single, 1 = Married; ^c 1 = Philippines = Referent group; ^d 0 = Less than moderately acute, 1 = Moderately or very acute; ^e 0 = Less than Moderately Dependent, 1 = Moderately or very dependent; Job satisfaction $\chi^{2}[9] = 100.19$; p < 0.001; *p < 0.05, **p < 0.01, ***p < 0.001.

4.3.2 Nurse outcomes: burnout - emotional exhaustion (Question 1).

Table 4.7 shows the results of the logistic regression that was performed to assess the impact of components of nurse work environment on emotional exhaustion after controlling for nurse and patient characteristics. Neither nurse characteristics (i.e., marital status and years of nursing experience) nor patient acuity level were found to be related to emotional exhaustion. Country where nursing education was received (India) was found to be a unique predictor of emotional exhaustion in models 1 and 2 but became non-significant in model 3 after accounting for other variables. Patient dependency level was found to be statistically significant in models 2 and 3.

Results of model 3 showed that after controlling for nurse and patient characteristics, only patient dependency level and one component of nurse work environment as measured by the PES-NWI, staffing and resource adequacy, were independent predictors of emotional exhaustion. Patient dependency levels yielded an odds ratio of 1.82, 95% CI [1.18, 2.82) indicating that nurses who reported caring for patients with moderate to high dependency levels were almost two times more likely to experience emotional exhaustion than nurses who cared for patients with lower dependency levels. Staffing and resource adequacy was found to be protective against emotional exhaustion. For every one unit increase in scores for staffing and resource adequacy, nurses were 0.36 times as likely to report high levels of emotional exhaustion, OR = 0.36, 95% CI [0.23, 0.54], (i.e., the nurses were less likely to report emotional exhaustion). The full model, model 3, was statistically significant, χ^2 (9) = 65.71, *p* < 0.001, indicating that the model was able to distinguish between respondents who reported high burnout and those who reported low or medium burnout. Nagelkerke R^2 was

18.9% and the model correctly classified 46.7% of cases with high levels of burnout and65.1% of the cases overall.

Table 4.7. Hierarchical Logistic Regression Results for Burnout - Emotional Exhaustion^a (N = 435)

	Model 1	Model 2	Model 3
Predictor variables		Would 2	Wibuci 5
	OR [95% CI]	<i>OR</i> [95% CI]	OR [95% CI]
Marital status ^b	0.73 [0.44, 1.20]	0.68 [0.41, 1.14]	0.74 [0.43, 1.28]
Years of nursing experience	0.99 [0.95, 1.03]	1 [0.96, 1.04]	0.99 [0.95, 1.03]
Country where nursing education received ^c			
India	0.51* [0.30, 0.85]	0.48* [0.28, 0.85]	0.58 [0.32, 1.05]
Saudi or other	0.74 [0.29, 1.86]	0.70 [0.27, 1.80]	0.71 [0.26, 1.91]
Patient Acuity ^d		0.75 [0.49, 1.16]	0.72 [0.46, 1.13]
Patient Dependency ^e		1.87** [1.22, 2.85]	1.82** [1.18, 2.82]
Nursing Foundation for Quality of Care (PES-NWI)			1.70 [0.97, 2.97]
Nurse Manager Ability, Leadership and Support of Nurses (PES-NWI)			0.83 [0.55, 1.25]
Staffing and Resource Adequacy (PES-NWI)			0.36*** [0.23, 0.54]
Nagelkerke R^2	6.4%	9.0%	18.9%
Correct classification	60.7%	62.3%	65.1%
Specificity (low or medium burnout)	68.2%	82.7%	78.0%
Sensitivity (high burnout)	50.0%	33.3%	46.7%

Note. a 0 = Low or medium burnout, 1 = High burnout; b 0 = Single, 1 = Married; c Philippines = Referent group; d 0 = Less than moderately acute, 1 = Moderately or very acute; e 0 = Less than moderately dependent, 1 = Moderately or very dependent; Emotional exhaustion $\chi 2[9] = 65.71$, p < 0.001; *p < 0.05, **p < 0.01, ***p < 0.001.

4.3.3 Nurse outcomes: intent to leave (Question 1).

Logistic regression results for intent to leave are shown in Table 4.8. Most notable is that there was only one significant predictor of intent to leave in any of the models, with nurses from India being far less likely to intend to leave their nursing position within the next year, OR = 0.43, 95% CI [0.25, 0.77]. None of the components of nurse work environment as measured by the PES-NWI were found to be unique predictors of intent to leave after accounting for nurse and patient characteristics. Model 3 was statistically significant, χ^2 (9) = 36.22, p < 0.001, with a Nagelkerke R^2 of 10.2%. The model correctly classified 73.4% of nurses who intend to leave and 63.2% of the cases overall.

Predictor variables	Model 1	Model 2	Model 3
	<i>OR</i> [95% CI]	<i>OR</i> [95% CI]	<i>OR</i> [95% CI]
Marital status ^b	1.34 [0.80, 2.24]	1.34 [0.80, 2.24]	1.52 [0.89, 2.58]
Years of nursing experience	0.97 [0.93, 1.00]	0.97 [0.93, 1.01]	0.97 [0.93, 1.00]
Country where nursing education received ^c India	0.40*** [0.24, 0.65]	0.39*** [0.23, 0.66]	0.43** [0.25, 0.77]
Saudi or other	0.41 [0.16, 1.03]	0.40 [0.16, 1.03]	0.39 [0.15, 1.01]
Patient acuity ^d		1.01 [0.66, 1.54]	1.02 [0.67, 1.57]
Patient dependency ^e		1.07 [0.72, 1.60]	1.07 [0.71, 1.07]
Nursing Foundation for Quality of Care [PES-NWI]			0.84 [0.49, 1.42]
Nurse Manager Ability, Leadership and Support of Nurses [PES-NWI]			0.89 [0.49, 1.42]
Staffing and Resource Adequacy [PES-NWI]			0.75 [0.52, 1.09]
Nagelkerke R^2	7.9%	7.9%	10.2%
Correct classification	62.1%	62.3%	63.2%
Specificity (very unlikely to somewhat unlikely)	51.0%	51.5%	50.5%
Sensitivity (somewhat likely or very likely)	71.0%	71.0%	73.4%

Table 4. 8. Results of Hierarchical Logistic Regressions for Intent to Leave^a (N = 456)

Note. ^a 0 = Very unlikely to somewhat unlikely, 1 = Somewhat likely or very likely; ^b 0 = Single, 1 = Married; ^c 1 = Philippines = Referent group; ^d 0 = Less than moderately acute, 1 = Moderately or very acute; ^e 0 = Less than Moderately dependent, 1 = Moderately or very dependent; Intent to leave $\chi^{2}[9] = 36.22$, p < 0.001; *p < 0.05, **p < 0.01, ***p < 0.001.

4.3.4 Nurse-Perceived quality of care: overall quality of care (Question 2).

Table 4.9 presents the logistic regression results for nurse-perceived quality of care. Among nurse and patient characteristics, only country where nursing education was received was significantly related to nurse-perceived quality of care, with nurses educated in India being twice as likely to report higher quality of care, OR = 1.97, 95% CI [0.99, 1.31].

Results of model 3 showed that, after accounting for nurse and patient characteristics, only two components of nurse work environment (nursing foundation for quality of care and staffing and resources adequacy) made statistically significant contributions to the model, with different strengths. For every one unit increase in scores for nursing foundation for quality of care, nurses were 2.53 times as likely to report very good or excellent quality of care, OR = 2.53, 95% CI [1.34, 3.0] while staffing and resources adequacy yielded an odds ratio of 1.98, 95% CI [1.28, 3.06]. The quality of nurse manager ability and leadership was not uniquely predictive of quality of care after accounting for nurse and patient characteristics. The final model, model 3, was statistically significant, χ^2 [9] = 65.53, p < 0.001, indicating that the model was able to distinguish between respondents who reported very poor to good quality of care and those who reported very good to excellent quality of care. Nagelkerke R^2 was 19.8% and the model correctly classified 96.3% of nurses who reported very good or excellent quality of care and 77.6% of the cases overall.

Predictor variables	Model 1	Model 2	Model 3	
	<i>OR</i> [95% CI]	<i>OR</i> [95% CI]	<i>OR</i> [95% CI]	
Marital Status ^b	0.98 [0.57, 1.68]	0.98 [0.56, 1.69]	0.73 [0.41, 1.31]	
Years of Nursing Experience	1.04 [0.99, 1.09]	1.05 [0.99, 1.10]	1.05 [0.99, 1.10]	
Country where Nursing Education Received ^c				
India	2.94** [1.56, 5.56]	2.63** [1.36, 5.10]	1.97** [0.99, 3.91]	
Saudi or other	0.80 [0.29, 2.19]	0.72 [0.26, 2.01]	0.70 [0.24, 2.04]	
Patient Acuity ^d		1.22 [0.76, 1.95]	1.18 [0.72, 1.93]	
Patient Dependency ^e		1.20 [0.76, 1.90]	1.30 [0.80, 2.11]	
Nursing Foundation for Quality of Care [PES-NWI]			2.53** [1.34, 4.64]	
Nurse Manager Ability, Leadership and Support of Nurses [PES-NWI]			0.77 [0.48, 1.24]	
Staffing and Resource Adequacy [PES-NWI]			1.98** [1.28, 3.06]	
Nagelkerke R^2	8.8%	9.3%	19.8%	
Correct Classification	75.4%	75.4%	77.6%	
Specificity (very poor to good)	0%	0%	20.4%	
Sensitivity (very good or excellent)	100%	100%	96.3%	

Table 4.9. <i>Results o</i>	f Hierarchical L	Logistic Regression	n Analyses for	Ouality of C	$are^a (N = 460)$
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Note. ^a 0 = Very poor to good, 1 = Very good or excellent; ^b 0 = Single, 1 = Married; ^c 1 = Philippines = Referent group; ^d 0 = Less than moderately acute, 1 = Moderately or very acute; ^e 0 = Less than moderately dependent, 1 = Moderately or very dependent; Quality of care $\chi^2[9] = 65.53$, p < 0.001; * p < 0.05, ** p < 0.01, *** p < 0.001.

4.3.5 Nurse-perceived patient safety outcomes: overall patient safety (Question 3).

Results of logistic regressions for nurse-perceived patient safety are shown in Table 4.10. None of the nurse or patient characteristics were significantly related to overall patient safety. Results of model 3 showed that after accounting for nurse and patient characteristics, two components of the PES-NWI, nursing foundation for quality of care and staffing and resource adequacy, were significant independent predictors of overall patient safety with odds ratios of 1.98 and 1.92, respectively. For every one unit increase in scores for these two components nurses were almost twice as likely to report very good or excellent patient safety. Similar to nurse-perceived quality of care, the level of nurse manager ability and leadership did not uniquely predict patient safety after accounting for nurse and patient characteristics. The whole model was statistically significant, $\chi^2[9] = 48.56$, p < 0.001, with a Nagelkerke R^2 of 15.7%. Ninety-seven percent of the cases who reported very good or excellent patient safety were correctly classified by the model, however, the predictive accuracy of the model for nurses who reported poorer patient safety was only 8.3%.

Predictor variables	Model 1	Model 2	Model 3	
	<i>OR</i> [95% CI]	<i>OR</i> [95% CI]	<i>OR</i> [95% CI]	
Marital status ^b	1.37 [0.76, 2.46]	1.35 [0.75, 2.45]	1.06 [0.57, 1.96]	
Years of nursing experience	0.57 [0.97, 1.06]	1.02 [0.97, 1.07]	1.02 [0.98, 1.07]	
Country where nursing education received ^c				
India	1.88 [0.99, 3.60]	1.72 [0.88, 3.37]	1.26[0.62, 2.54]	
Saudi or other	2.03 [0.55, 7.50]	1.88 [0.50, 6.99]	1.90 [0.50, 7.21]	
Patient acuity ^d		1.08 [0.65, 1.77]	1.05 [0.62, 1.75]	
Patient dependency ^e		1.35 [0.84, 2.18]	1.46 [0.89, 2.42]	
Nursing Foundation for Quality of Care [PES-NWI]			1.98* [1.07, 3.63]	
Nurse Manager Ability, Leadership and Support of Nurses [PES-NWI]			1.01 [0.64, 1.62]	
Staffing and Resource Adequacy [PES-NWI]			1.92** [1.23, 3.01]	
Nagelkerke R^2	5.1%	5.8%	15.7%	
Correct classification	79.1%	79.1%	78.4%	
Specificity (very poor to good)	0%	0%	8.3%	
Sensitivity (very good or excellent)	100%	100%	97%	

Table 4.10. Results o	f Hierarchical Logisti	c Regression Analyses	for Patient Safety ^a ($N = 459$)

Note. ^a 0 = Very poor to good, 1 = Very good or excellent; ^b 0 = Single, 1 = Married; ^c 1 = Philippines = Referent group; ^d 0 = Less than moderately acute, 1 = Moderately or very acute; ^e 0 = Less than moderately dependent, 1 = Moderately or very dependent; Patient safety $\chi^2[9] = 48.56$, p < 0.001; *p < 0.05, **p < 0.01, ***p < 0.001.
4.4 Summary of Hierarchical Logistic Regression Analyses

Table 4.11 identifies the predictor variables that were found to be statistically significant in each of the final models for the five outcome variables. The findings of logistic regressions are also summarized below with respect to each of the research questions.

Predictors	Job Satisfaction	Emotional Exhaustion	Intent to Leave	Quality of Care	Patient Safety
Country where Nursing Education Received	2.02		0.43	1.97	
Patient Dependency		1.82			
Nursing Foundation for Quality of Care				2.53	1.98
Nurse Manager Ability, Leadership and Support of Nurses	2.10				
Staffing and Resource Adequacy	2.11	0.36		1.98	1.92
Nagelkerke R^2	27.2%	18.9%	10.2%	19.8%	15.7%
Overall Correct Classification	74.1%	65.1%	63.2%	77.6%	78.4%.

 Table 4.11. Summary of Significant Predictors for the Five Outcome Variables

4.4.1 Research question # 1:

What are the relationships between components of nurse work environment and nurse outcomes (i.e., burnout, job satisfaction, and intent to leave) after controlling for nurse and patient characteristics?

With respect to nurse work environment components, the staffing and resource adequacy subscale was predictive of both emotional exhaustion and job satisfaction. Nurse

manager ability and leadership support of nurses was predictive only for job satisfaction. Nursing foundation for quality of care was not predictive of any of the three nurse outcomes after accounting for nurse and patient characteristics. Intent to leave was the only nurse outcomes that was not associated with any components of nurse work environment, after accounting for all other predictors in the model. For intent to leave, only country where nursing education was received (India) was predictive of intent to leave. Values of Nagelkerke R^2 for regression models for nurse outcomes ranged from 10.2% to 27.2%, with overall classification accuracies ranging from 63.2% to 74.1%.

4.4.2 Research question # 2:

What are the relationships between components of the nurse work environment and nurse-perceived quality of care after controlling for nurse and patient characteristics?

After accounting for nurse and patient characteristics, country where nursing education was received in India, and two components of nurse work environment, staffing and resources adequacy and nursing foundation for quality of care, were independent predictors of quality of care. The level of nurse manager ability and leadership support of nurses was not predictive of quality of care. Nagelkerke R^2 for the regression model was 19.8%, with an overall classification accuracy of 77.6%.

4.4.3 Research question # 3:

What are the relationships between components of nurse work environment and nurse-perceived patient safety after controlling for nurse and patient characteristics?

After accounting for nurse and patient characteristics, only two components of nurse work environment, nursing foundation for quality of care and staffing and resource adequacy, were predictive of overall patient safety. Similar to nurse-perceived quality of care, the quality of nurse manager ability and leadership support of nurses was not uniquely predictive of patient safety. Nagelkerke R^2 for the regression model was 15.7%, with an overall classification accuracy of 78.4%.

4.5. Conclusion

Components of nurse work environment (as measured by the PES-NWI) were significantly associated with most of the studied outcome variables. Staffing and resources adequacy was uniquely predictive of all nurse and patient outcomes except for intent to leave. Nurse manager ability and leadership support for nurses was only predictive of job satisfaction whereas nursing foundation for quality care was predictive of both patient outcomes (i.e., quality of care and patient safety). Although overall classification was moderately accurate, the low values of the pseudo *R2*, indicate that there are other factors that may be contributing to variation in the outcome variables.

Chapter 5: Discussion

The purpose of this study was to examine the impact that components of nurse work environment have on three nurse outcomes (i.e., job satisfaction, burnout, and intent to leave) and two patient outcomes (i.e., nurse-perceived quality of nursing care and patient safety) in Saudi Arabia. This study drew on cross-sectional survey data that were collected from 496 RNs working in a large tertiary hospital in Riyadh city, Saudi Arabia. Three components of nurse work environment as measured by the PES-NWI (nursing foundation for quality of care, nurse manager ability and leadership support of nurses, and staffing and resource adequacy) were examined in relation to the selected nurse and patient outcomes.

There were four key findings identified in this study. First, the quality of staffing and resource adequacy significantly predicted all nurse and patient outcomes except for intent to leave. Second, the quality of the nurse manager ability and leadership was not significantly associated with any of the studied outcome variables except for job satisfaction. Third, nursing foundation for quality of care was found to be predictive of quality of care and patient safety. Finally, there were significant differences between nurses who were educated in different countries in relation to both predictor and outcome variables. These findings will be discussed below, followed by a discussion of strengths and limitations of the study, and implications for nurse leaders and future nursing research.

5.1 Nurse Work Environment

5.1.1 Staffing and resource adequacy.

Adequacy of nurse staffing is the component of the work environment that has been most widely studied in association with nurse (Aiken et al., 2002a; Cho et al., 2009; Friese,

2005; Hinno et al., 2011; Kanai- Pak et al., 2008; McCusker et al., 2004) and patient outcomes (Lee & Scott, 2016). It is a unit-level phenomenon that refers to nurses' perceptions of having enough staff and resources to meet workload demands in their jobs (Lake, 2002). In this study, one of the most significant aspects of the Saudi Arabia work environment for nurses is that adequate staffing and resources is predictive of job satisfaction, lower emotional exhaustion, and higher-reported quality of care and patient safety.

Consistent with earlier studies (Cho et al., 2009; Havaei, 2016), in this study, more positive nurses' perceptions of staffing and resources adequacy were associated with increased odds of nurses reporting job satisfaction and decreased likelihood of reporting burnout. Bruyneel et al. (2009) investigated the effect of the PES-NWI factors on nurse outcomes (i.e., job satisfaction, burnout, and intention to leave) and quality of care, and found that every one unit increase in scores for staffing and resources adequacy was associated with a three-fold increase in the odds of nurses reporting high job satisfaction and substantial decrease in the odds of reported burnout. Other studies also found that nurses who perceived greater access to staffing and resources also reported higher rates of quality of care (Cho et al., 2009; Hinno et al., 2011) and patient safety (Coetzee et al., 2013). Coetzee and colleagues found that for every one unit increase in patient to nurse ratios, nurses working in public hospitals were less likely to report good/excellent quality of care and patient safety at their units. Staffing and resource adequacy is often identified as one component of structural empowerment with links to improved nurse and patient outcomes (Armstrong & Laschinger, 2006; Laschinger, 2008; Laschinger, Leiter, Day, & Gilin, 2009; Laschinger, Finegan, Shamian, & Wilk, 2003). Structural empowerment is the degree to which nurses have access to structures in their nursing units (e.g., resources, support, professional development, and

educational opportunities) which empower them to meet job demands (Kanter, 1993). The degree to which nurses have access to empowering structures is an important contributor of quality and safety of patient care (Tinkham, 2013). These findings add to the growing body of evidence that points to the undeniable link between nurse work environment with optimal staffing and resources levels and positive nurse and patient outcomes. Although existing studies have been conducted in Western counties, this claim holds true for nurses working in Saudi Arabia.

Consistent with findings of Van Bogaert et al. (2014) and Bruyneel et al. (2009), but inconsistent with findings from Hinno et al. (2011) and Choi et al. (2013), perceptions of staffing and resources adequacy were not found to be uniquely predictive of intent to leave after controlling for nurse and patient characteristics and other components of nurse work environment. Other factors may be more important predictors of intent to leave than staffing and resources adequacy. Kramer and Schmalenberg (2005b) suggested that the mechanism by which staffing and resources adequacy impact nurse and patient outcomes is complex and influenced by multiple factors where they identified nursing care delivery system and teamwork as factors affecting nurses' perceptions of staffing and resources adequacy which were not measured in the present study.

The non-significant relationship between the quality of staffing and resources adequacy and intent to leave in this study may be attributable to the strong effect of another control variable that may have cancelled out/reduced the effect of staffing and resources adequacy on intent to leave. In particular, country where nurses received their nursing education was surprisingly the only significant predictor of intent to leave in this study. The majority of the sample in this study were expatriate nurses (99.2%), mostly from the Philippines and India, who may have experienced working in nursing units with less

satisfactory staffing and resources levels as compared to Saudi hospitals, therefore, their perceptions of current staffing and resources adequacy did not predict intention to leave. Mark (2002) demonstrated that nurses' current perceptions of staffing adequacy were also found to be significantly influenced by prior perceptions. Another explanation may be the lack of consistency on how to measure staffing and resources adequacy as neither of the two studies that found significant associations had measured staffing adequacy using the PES-NWI. Hinno et al. (2011), for example, used a previously validated tool, the NWI-R scale; whereas Choi and colleagues developed their own instrument to measure five dimensions of nursing work environment including subscale to measure staffing and resources (Choi et al., 2013). A single item measure of staffing adequacy such as nurse to patient ratios, has also been used in some previous studies (e.g., Coetzee et al., 2013).

5.1.2 Nurse manager ability and leadership support of nurses.

Another component of nurse work environment that is critical to the nurse outcome, job satisfaction, was the nurse's perceptions of their nurse manager's ability and support of nurses (e.g., backing up nurses' decision making), a unit level phenomenon (Lake, 2002; Warshawsky & Havens, 2011). The current study demonstrated that for every one unit increase in scores for nurse manager ability and leadership, nurses were almost twice as likely to report higher levels of job satisfaction. This result is consistent with findings by Van Bogaert et al. (2014) where they conducted a multilevel modelling study to examine the impact of three nurse work environment factors on nurse and patient outcomes. Nurse manager ability and leadership support was found to be strongly predictive of nurse job satisfaction. Every one unit increase in the rating of this subscale was significantly associated with an 11 fold increase in the odds of nurses reporting job satisfaction. Previous research studies also support the notion that nurses' job satisfaction is directly and positively influenced by the quality of nursing management (Van bogaert et al., 2012; 2013b; Van bogaert et al., 2012; 2013a). A systematic review of hospital nurses' job satisfaction found that a perceived lack of supportive and respectful nursing management had a pronounced impact on nurses' job dissatisfaction (Hayes et al., 2010). Nurse managers who failed to recognize nurses for work accomplishments and/or who provided excessive criticism or failed to back-up the nursing-staff decision making when clinical incidents arose were perceived by nurses as contributors to job dissatisfaction (Cortese, 2007). This study finding, the relationship between nurse manager ability and leadership with nurses' job satisfaction, reinforces the notion that staff support is an important aspect of nursing leadership empowerment, particularly in the Saudi Arabia nurse population (MacPhee et al., 2014; Laschinger, & Finegan, 2005).

Among studies that investigated the effect of PES-NWI components on nurse outcomes (i.e., job satisfaction, burnout, and intention to leave) and quality of care using logistic regression analyses, Bruyneel et al. (2009) found that nurse manager ability and leadership support of nurses was not predictive of any of the studied outcmoes. Findings from the present study were partially consistent with this evidence, in that no association was found between nurse manager ability and leadership support and four of the five studied outcome variables (burnout, intention to leave, and quality of patient care, and patient safety). These results may be attributable to the potential mediation role of job satisfaction between nursing leadership and other outcomes such as intent to leave and quality of care.

In this study about Saudi nursing workforce, the empirical evidence on the effects of nursing leadership on some nurse and patient outcomes were inconclusive. Van Bogaert and colleagues reported mixed results in relation to the association between unit-level nursing

management and intention to leave (Van Bogaert at al., 2013b; 2014; Van Bogaert at al., 2013b). However, other researchers found a positive relationship between nursing leadership and quality of patient care were evident in the literature (Havaei, 2016; Van bogaert et al., 2009a; 2013b; 2014). In this study, the inconclusive findings may be related to how concepts are operationalized and measured and the level of analysis.

5.1.3 Nursing foundation for quality of care

Nursing foundation for quality of care was found to be the strongest predictor of nurse perceptions of quality and safety of patient care. This component of the PES-NWI is considered to be a hospital-level phenomenon, referring to hospital support for professional nursing practice, for example, having a clear philosophy of nursing, basing nursing care on a nursing model rather than a medical model, and providing active staff development or continuing education (Lake, 2002). Our study found that every one unit increase in scores for nursing foundation for quality care was associated with 2.53 times increase in the odds of nurses reporting very good or excellent quality of care and 1.98 times increase in the likelihood of reported very good or excellent patient safety. Previous empirical evidence has also linked more satisfactory ratings of nursing foundation for quality care with nurse perceptions of better quality and safe care delivery (Havaei, 2016; Laschinger & Leiter, 2006; Laschinger, 2008). Laschinger and Leiter (2006) surmised that when nurses perceive hospital support for a nursing model of care delivery, they may equate support for nursing values and standards with an environment that also values quality, safe patient care delivery. Interestingly, and contrary to prior research, the regression analyses conducted in this study failed to find relationships between nurses' perceptions of nursing foundation for quality care and nurse outcomes such as job satisfaction (Havaei, 2016; Laschinger, 2008), measures of

burnout (Leiter & Laschinge, 2006), and turnover intention (Gardner et al., 2007). In the current study, it seems that other work environment characteristics were more important influences on these nurse outcomes. Findings of this study suggest the importance of the three components of nurse work environment (i.e., nursing foundation for quality of care, nurse manager ability and leadership support of nurses, and staffing and resource adequacy) for the Saudi Arabia nurse population.

There has been great variation in the way that PES-NWI measures have been applied in research. Lake (2002) developed three of the five PES-NWI subscales for the unit level, (i.e., aggregated scores for nurses within a unit, then correlated with outcomes at a unit level), (nurse manager ability and leadership support of nurses; staffing and resource adequacy; and collegial relationships) whereas nurse foundations for quality of care and nurse participation in hospital affairs applied to the hospital level. This suggests that PES-NWI subscale scores and outcome measures should be aggregated for nurses within the unit or hospital, respectively, or analyzed through multi-level modelling (e.g., Choi & Boyle, 2014, Van Bogaert et al., 2010; Eaton-Spiva et al., 2010; Kramer et al., 2011). However, this study used the PES-NWI subscales at an individual level, which is a statistical approach that has been used by many researchers who aimed to examine differences within subscales of work environment (e.g., Choi et al., 2013; Bruyneel et al., 2009; MacPhee, Dahinten, & Havaei, 2017). The majority of the current study's nurse work environment findings were consistent with the findings revealed in Western literature, however, a few inconsistent findings may be attributed to participants' cultural differences.

Findings of the current study and those from previous research suggest the critical role that components of nurse work environment play on nurse outcomes and nurse perceptions of the quality and safety of patient care (Bruyneel et al., 2009; Choi,

2013; Havaei, 2016; Laschinger, 2008; Van Bogaert et al., 2014). In this study, three components (i.e., nursing foundation for quality of care, nurse manager ability and leadership support of nurses, and staffing and resource adequacy) were of particular importance to nurse recruitment and retention and their contribution to a better quality and safe care delivery.

5.2 Nurse Characteristics – Country where Nursing Education Received

Unique to the provision of nursing care in Saudi Arabia is the significant number of expatriates that are contracted from India and the Philippines. As such, the majority of nurses in this study were Asian (94.3%), mostly from the Philippines and India, who are part of a collectivistic culture, whereas Western nurses belong to an individualistic culture (Triandis, 1995). Liou and Cheng (2009) found that due to differences in cultural orientations, Asian nurses perceived aspects of nurse work environments (as measured by the PES-NWI) differently than American nurses. Diversity of cultural orientation in nursing practice also contributed to differences in nurse outcomes such as job satisfaction for another study with Asian nurses (Kirman & Shapiro, 2001; Liou, Tsai, & Cheng, 2013). Strategies to facilitate cultural adaptation of Asian nurses in the Saudi health care system may be needed to promote retention and alleviate the nursing shortage in Saudi Arabia.

An unexpected key finding in this study was the strong effect of one of the control variables on three of the five outcome variables in this study. Country where nursing education was received was uniquely predictive of job satisfaction, intent to leave, and quality of care, over and above the effect of other nurse and patient characteristics, and components of nurse work environment. Nurses who were educated in India were twice as likely to report higher levels of job satisfaction and higher quality of care compared with nurses who were educated in the Philippines. Indian nurses were also far less likely to report

intent to leave their position within the next year compared to Filipino nurses. Most notably, the country where nursing education was received was the only statistically significant predictor of turnover intentions.

One possible explanation for the strong difference between Asain and Indian nurses in terms of outcome variables may relate to differences in cultural values between the two countries. The degree to which Filipino nurses are influenced by certain cultural values such as collectivism⁴, power distance, uncertainty avoidance, and determinism may be different than for Indian-educated nurses (Dissanayake et al., 2015). Although Asian nurses may exhibit/experience higher levels of collectivism than Western nurses, there may also be differences in levels of collectivism between different Asian cultures. Differences in job outcomes such as employee satisfaction, performance, organizational commitment (Dorfman & Howell, 1988) and turnover intentions (Liou & Grobe, 2008) were previously linked to differences in cultural orientations. The extent to which nurses are attached to cultural beliefs may influence their level pf job satisfaction, organizational commitment and intent to leave their jobs.

Another possible explanation for the significant differences in outcomes is the acculturation of Asian nurses to the Saudi healthcare system. Acculturation is adoption of another culture's values, behaviours, and attitudes (Shiraev & Levy, 2007). Previous research found that people who belong to a collectivist culture are inclined to maintain their cultural beliefs, values and practices, suggesting that collectivists may acculturate to new environments less readily (Phalet & Hagendoorn, 1996). Greater collectivist orientation has been found to be associated with lower levels of acculturation (Gomez, 2003). It has been

⁴ Collectivism refers to "the tendency to value group welfare more than one's own" (Kirman & Shapiro, 2001, P. 558).

argued that, in general, Indians tend to have lower levels of collectivism than Filipinos (Disanayake et al., 2015), therefore, they may adapt to the Saudi healthcare system faster or more easily, and, in turn, be more satisfied and less likely to leave their positions. Some evidence supports this proposition, one study found a positive correlation between acculturation and nurse outcomes (Ea, Griffin, LEplattenier, & Fitzpatrick, 2008).

It also should be noted that the majority of nurses in this study (e.g., Asian) were nurses on short-term contracts to earn more money in Saudi Arabia. Nurses from other countries will often work in Saudi Arabia to establish financial security (Alonso-Garbayo & Maben, 2009). In Saudi Arabia, nurses often have 1-year contracts with no guarantee of renewal. Renewal depends on availability of qualified Saudi nurses. As such, the nurses in this study nurses may have been fearful to speak negatively about their employer and subsequent repercussions despite the anonymity of the study, which may explain some of the non-significance findings in this study. The literature suggests that Western nurses are treated more favorably in Saudi Arabia than Asian nurses, with more satisfactory payment and privileges (Aldossary, While, & Barriball, 2008; Alyami & Watson, 2014). Less favorable treatment may influence Asian nurses' job satisfaction, emotional exhaustion, and ultimately, their intentions to leave.

5.3 Patient Characteristics

Contrary to prior research (Havaei et al., 2016; MacPhee et al., 2017), patient acuity was not found to be associated with any of the nurse or patient outcomes. Patient dependency was found to be predictive of only one of the five outcomes (i.e., emotional exhaustion). In this study, acuity referred to the complexity of patient care that requires critical thinking competencies. Dependency referred to patients' need for assistance with activities of daily living. The Asian nurses in this study come from countries where dependency needs are typically met by family members, not nurses. One explanation for these findings, therefore, may be that nurses in this study were not exhausted or adversely influenced by work associated with professional nursing; instead, they were emotionally exhausted by doing 'non-nursing' care activities. The Saudi healthcare system, has been trying to encourage family members to be more engaged in the provision of non-nursing patient care but this has not happened yet.

Another possible explanation for the non-significant findings of patient cherectristices is that the one-item measures used in this study may not have adequately captured variations in nursing workloads. For example, one patient characteristics tool, the synergy tool, has five distinct characteristics associated with acuity and three distinct characteristics associated with dependency (Brewer, 2006; Ho et al., 2017). Holden et al., (2011) similarly stipulated that nursing workload at the unit level is influenced by multiple factors including nurse-patient ratio, patient acuity, and staffing and resources adequacy, suggesting the need to use more comprehensive approaches when assessing nursing workloads.

5.4 Strengths and Limitations

One of the strengths of this study was the large sample size (N= 496) which was drawn from multiple nursing units across the hospital. According to the formula recommended by Peduzzi, et al. (1996), a total of 400 participants is considered adequate for the application of multiple logistic regression. Although the diversity of the sample may have introduced unmeasured confounding factors, the large sample minimized the risk of type II error and enhances the generalizability of results (Polit & Beck, 2012).

Despite the strength of the current study, findings of this study should be interpreted

with caution due to a number of limitations. First, the reliance on cross-sectional data precluded drawing conclusions about causal relationships between nurse work environment and study outcomes. The study was also subject to monomethod and self-report bias as all measures were nurse-reported and collected via an online survey. However, this study used similar methods and measures as in the RN4Cast studies, which have been conducted widely and validated internationally (Aiken et al., 2012; McHugh & Stimpfel, 2012; Scott et al., 2013).

Under-reporting of patient safety outcomes (i.e., adverse events) may have also hindered the ability to investigate the relationships between components of nurse work environment and adverse events within the Saudi Arabian context, particularly due to social desirability. Nurses in this study may have under-reported frequencies of adverse events due to nurses' reluctance to admit mistakes (Scott et al., 2013; Boev, 2012), or uncertainty about what constitutes patient quality and safety (Levinson, 2012). Finally, the omission of two subscales of the PES-NWI from the regression models may also have influenced the relationships found for other predictors that were kept in the model.

Another limitation is the use of nested data (i.e., data collected from a number of nurses working in the same units, and from multiple nursing units in the same hospital) without the use of multilevel modelling, which may increase the risk of type I error (Woltman, Feldstain, MacKay, & Rocchi, 2012). However, as the data were collected from only one hospital in Riyadh, Saudi Arabia, asking participants to identify their particular units might have hindered recruitment resulting in a decreased response rate. Finally, the generalizability of the findings across Saudi Arabia and beyond may also be limited due to the use of a single hospital. However, this study provided the first empirical evidence

addressing the relationships between nurse work environment and nurse outcomes, quality of nursing care, and patient safety in Saudi Arabia.

5.5 Implications

5.5.1 Implications for nurse leaders

The current study was intended to address knowledge gaps in the literature with respect to nurses' work environments and nurse and patient outcomes within the Middle Eastern context. Findings of this study support the notion that favorable nurse practice environments contribute to better nurse outcomes, particularly job satisfaction (Aiken et al., 2002a,b; 2008a,b; 2012; Lake, 2007) and reduced burnout (Aiken et al., 2002a, b; 2008a,b; Nantsupawat et al., 2011), particularly emotional exhaustion. Results also add to the growing body of knowledge linking favorable nurse work environments with better nurse-perceived quality of care (Aiken et al., 2002a; 2008 a,b; Friese, 2005; Hinno et al., 2011; Nantsupawat et al., 2011) and nurse-perceived patient safety (Aiken et al., 2008a; Clarke & Aiken, 2003; Friese et al., 2008; Laschinger & Leiter, 2006).

To improve recruitment and nurse retention in Saudi Arabia and facilitate better quality and safe care delivery, nurse leaders should take actions to improve the quality of nurses' work environments, particularly with respect to staffing and resource adequacy, nursing foundation of quality care and to a lesser extent nurse manager ability and leadership support. These measures on the PES-NWI (Lake, 2007), which are considered magnet-like characteristics of nurses' work environments that draw in and retain nurses, are used by many healthcare organizations worldwide as a proxy for healthy work environments (Stimpfel, Rosen, & McHugh, 2014). In Saudi Arabia, only two hospitals are designated as Magnet hospitals (Alghamdi & Urden, 2015). Hospitals in Saudi Arabia should consider using validated tools, such as the PES-NWI, to diagnose their work environments and strive for magnet-like qualities of importance to nurses and patients.

Magnet-like work environments have effective nurse leaders at all organizational levels (Kelly et al., 2011; Stimpfel et al., 2014). In Saudi Arabia, a common issue is lack of formal nurse leaders to represent their nursing staff. Despite the efforts of hospitals in Saudi Arabia to adopt decentralized management models, decision-making of healthcare services, for the most part, is restricted to top-level management. Unit-level nurse leaders have limited authority, negatively affecting their capacity to influence the quality of nurses' work environments (Alghamdi & Urden, 2015) and subsequently nurses' job satisfaction.

The role of nurse leaders is pivotal in creating and sustaining healthy work environments to facilitate professional nursing practice that will support staff nurses to achieve common goals (Germain & Cummings, 2010). Although nurse leaders in Saudi hospitals typically lack formal authority, there are leadership styles they can learn and hone over time that are associated with positive nurse and patient outcomes (Cummings et al., 2010; Wong, Cummings, & Ducharme, 2013). Transformational leaders, for example, have styles of leadership that can inspire and motivate nurses to value themselves and the nursing work they do (Aronson, 2001). The role of nurse leaders in staff empowerment, through facilitating access to support, resources, and information, is essential to promote nurses' sense of control over practice and professional autonomy, which in turn, enhance their positive attitudes and abilities to get the job done. Leader empowering behaviours can create magnet-like work environments linked to increased job satisfaction and organizational commitment (Laschinger et al., 2011; Laschinger, & Finegan, 2005; MacPhee, 2007). Currently, Saudi Arabia lacks formal leadership development programs for nurse leaders—a human resource investment well worth considering (Galuska, 2014).

In the Saudi context, findings from this study suggest that savvy nurse leaders are needed who can appreciate cultural orientations of the Saudi nursing workforce. Cultural sensitivity (Shiraev & Levy, 2007) may be critical to attracting and retaining Saudi nurses and nurses from other countries who are currently vital to alleviating the nursing shortage. Culturally sensitive support and adaptation strategies must be in place (Hayne, Gerhardt, & Davis, 2009), for example, to enhance acculturation of Asian nurses to the Saudi healthcare system.

5.5.2 Implications for future research

The findings of this study were based on individual-level data analyses, which precluded the ability to account for differences in perceptions of RNs working in different nursing units. Areas of nursing practice may have an influence on how nurses perceive their work environment resulting in differences in perceptions of nurse and patient outcomes such as job satisfaction and quality of patient care, respectively. For example, in an earlier study, MacCusker et al. (2004) found that relationships between components of nurse work environment (particularly for staffing and resources adequacy) and nurse-perceived quality of care differed significantly across nurses working in the same hospital but in 13 different nursing units. In addition, three of the five PES-NWI were originally developed to be used at the unit level (nurse manager ability and leadership, support of nurses; staffing and resource adequacy; and collegial relationships) whereas nurse participation in hospital affairs and nurse foundations for quality of care were intended to be used at the hospital level (Lake, 2002). Therefore, multi-hospital studies using multilevel modelling approach are recommended, especially within the Middle Eastern context. Further investigation should be

extended to include three levels; individual, unit, and hospital with identification of nursing units and hospitals.

Due to the lack of nurse work environment research within the Saudi Arabian context, replication of this study in other Saudi hospitals, with additional acuity and dependency characteristics to assessment of patient needs, is mandatory to validate the current findings. Longitudinal study designs are also recommended to allow measuring how changes in the nurse work environment over time impact nurse and patient outcomes. At the same time, further work is necessary to identify other aspects of the work environment of important nurses working in a collective society.

5.6 Conclusion

This study demonstrated that supportive nursing leadership with adequate staffing and resources and hospital support of nursing foundation of quality care can foster positive nurse and patient outcomes. These findings are strongly supported by other research evidence that highlights the critical influence of magnet-like characteristics on nurse and patient outcomes. A unique finding from this study was the influence of nurses' country of origin (i.e., cultural backgrounds) on nurse outcomes and quality of patient care. These findings suggest that nurse leaders need to pay particular attention to culturally sensitive recruitment and retention strategies. There is a scarcity of Middle Eastern research, Saudi Arabia in particular, with respect to assessment of specific components of nurses' work environments on nurse and patient outcomes (Aboshaiqah, 2015; AbuAlRub et al., 2016; El-Jardali et al., 2011). These studies used aggregated measures of the work environment precluding the ability to compare their findings with findings from this study. Finally, there may be other aspects of the work

environment that are necessary to capture the Saudi Arabia healthcare context that has not been identified in the current instruments which have been developed in North America.

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Appendices

Appendix A: Overview of the Healthcare System in Saudi Arabia

The healthcare system in Saudi Arabia (SA) is a national system that provides healthcare services to a total population of 31,742,308 million through public (governmental) sectors and private agencies (General Authority for Statistics (Kingdom of Saudi Arabia, 2016). The public sector is composed of the Ministry of Health (MOH), university hospitals (e.g., King Saud University Medical Hospital), specialized hospitals (e.g., King Faisal Specialist Hospital and Research Center), and military hospitals (e.g., Security forces hospital), each of which has its own funding, regulatory body, and management (Almalki et al., 2011). The governmental sector provides all levels of healthcare services including primary, secondary and tertiary healthcare services with a total of 283 hospitals (44.099 beds) (Ministry of Health [MOH], 2014). Unlike Western national healthcare systems, almost 79% of health services in SA are provided by the public sector with the MOH being the major provider and financer, contributing to 59.5% of healthcare services (MOH, 2009). The total number of healthcare professionals in SA is about 248,000; only 38% of which are Saudi nationals. The reminders are expatriates who are recruited from different countries all over the world (WHO, 2010).

Description of Nursing Education Programs in Saudi Arabia

The majority of the nursing workforce in SA are graduates of Saudi Health Institutes and Junior Colleges. The first Health Institute was initiated in 1958 to train students with elementary school preparation (6 years of schooling) who were admitted into a 1-year nursing program. This program was extended later to a 3-year nursing program recruiting students with secondary school preparation; that is, 9 years of schooling (Miller-Rosser et al., 2006). In an attempt to improve the level of nursing education, Junior Colleges were established in 1992 that targeted high school prepared students with 12 years of schooling (Aldossary et al., 2008). Only a small percentage of nurses in SA are university graduates with a Bachelor of Science in Nursing degree (a 5-year nursing program in SA), with even fewer holding a Master's or Doctoral degree in nursing (Aldossary et al.). All Health Institute and Junior College graduates are considered diploma qualified nurses who are classified as 'technical nurses' whereas nurses who achieve a BSN degree are classified as 'professional nurses'. However, nurses at all levels are required to register with the Saudi Commission for Health Specialists in order to practice nursing in SA (Saudi Commission for Health Specialites, 2014).

Appendix B: Recruitment Poster



The University of British Columbia

Nurse Participants Needed!

The Impact of Nurse Work Environment in Saudi Arabia



We are looking for Registered Nurses (RNs) who....

- Provide direct nursing care to patients in inpatient units or outpatient clinics
- Hold a diploma in nursing or higher nursing credentials
- Are Saudi citizens or foreign educated nurses (expatriates)

.... to participate in a research study for a graduate thesis. We would like to hear your thoughts about your workplace environment, job satisfaction, and quality of patient care. The online survey will take only 20-25 minutes to complete.

Please check your e-mailbox for a chance to participate. We are looking forward to hearing from you by XXXX. Your thoughts really matter!

Survey participants will be entered in a raffle draw to win one of ten SR100 gift cards!

For more information, please contact: xxxxxx

Recruitment Poster

Version 2; 20 April 2017

Page 1 of 1

Appendix C: Invitation Emails Script

FIRST INVITATION EMAIL

Subject Line: The Impact of Nurse Work Environment in Saudi Arabia

Dear colleagues,

My name is Amal Alharbi and I am a student in the Master of Science in Nursing (MSN) program at the University of British Columbia (UBC) in Vancouver, Canada. You are invited to participate in a study about "The Impact of Nurse Work Environment in Saudi Arabia". The purpose of this study is to investigate the impact of nurses' perceptions of their work environment on nurse outcomes such as job satisfaction and patient related outcomes such as quality of care. To date, most of the research on nurse work environments been conducted in the United States and Europe, with very little emanating from Saudi Arabia or the Middle East.

You were chosen as a prospective participant in the study because you are a Registered Nurse who provides direct care to patients in an inpatient unit or outpatient clinic. Your participation will involve filling out a confidential, online survey. It will take approximately 20 to 25 minutes to complete the survey. Your participation is entirely voluntary and will not affect your status at the Hospital.

Survey participants will be entered in a raffle draw to win one of ten SR100 gift cards.

Potential Risks and Benefits from Participating in the Study

There are no known risks from participating in this study. This project is not expected to offer you any direct benefits. However, study results may help to improve nurses' work environments, and nurse and patient outcomes. The results of this study will be published in academic journals and will be available to you through the UBC Library as part of my thesis (<u>http://circle.ubc.ca/</u>).

Confidentiality

All responses are anonymous and will be treated confidentially. All documents will be identified only by a case ID number. The survey does not ask for personal identifiers such as name, email address, employee number, or nursing unit. The survey asks about participant characteristics such as age and education, but these will only be used to describe the overall sample, and will not be used in any way to identify individual participants. Moreover, you may choose to not answer any particular question. After the survey is complete, the data will be sent securely to the research team in Canada via an encrypted, password protected external hard drive, and the data on the server will be permanently deleted from the hospital server. Data will then be stored on a password protected research computer at the University of British Columbia, School of Nursing in Vancouver, Canada and will be accessible only to the research team identified on the ethics applications.

If you choose to complete the raffle form, you will send your contact information directly to the research team so that it is kept confidential and separate from the survey responses. The information on your raffle form will be used solely to determine and contact the winners.

Contact for Information about the Study

If you have any questions or need further clarification about the study, please contact a member of the study team. Their names and telephone numbers are listed at the bottom of this email message.

Participant Consent

Your participation is entirely voluntary. You may choose not to participate and you can withdraw from the study at any time during completion of the online survey <u>prior to pressing the 'submit'</u> <u>button</u>. However, once the completed survey is submitted, responses cannot be withdrawn as we have no way of linking the survey with the person who submitted it.

The survey will be available X/X/X

Thank you for considering participating in this study. Your views are very important! The Research Team: xxxxxxxx

SECOND EMAIL – FIRST REMINDER EMAIL

Subject Line: Follow up invitation ... The Impact of Nurse Work Environment in Saudi Arabia

Dear Colleagues,

How is your nursing work environment impacting you and your patients?

If you haven't already done so, please share your perspectives about nurse work environment with us in a confidential, online survey at: XXXXXXXX

You were chosen as a prospective participant in the study because you are a Registered Nurse who provides direct care to patients in an inpatient unit or outpatient clinic. It will take approximately 20 to 25 minutes to complete the survey. Your participation is entirely voluntary and will not affect your status at Hospital.

We are looking forward to hearing from you before X/X/X

Survey participants will be entered in a raffle draw to win one of ten SR100 gift cards!

Thank you for considering participating in this study. Your views are very important!

Sincerely, **The Research Team:** xxxxxxx

FINAL EMAIL - SECOND REMINDER

Subject Line: Final invitation... The Impact of Nurse Work Environment in Saudi Arabia

Dear Colleagues,

How is your nursing work environment impacting you and your patients?

If you haven't already done so, please share your perspectives about nurse work environment with us in a confidential, online survey at: XXXXXXXX

You were chosen as a prospective participant in the study because you are a Registered Nurse who provides direct care to patients in an inpatient unit or outpatient clinic. It will take approximately 20 to 25 minutes to complete the survey. Your participation is entirely voluntary and will not affect your status at Hospital.

The survey will be closing on X/X/X

Survey participants will be entered in a raffle draw to win one of ten SR100 gift cards!

Thank you for considering participating in this study. Your views are very important!

Sincerely, The Research Team: xxxxxxx

Appendix D: Study Survey





THE UNIVERSITY OF BRITISH COLUMBIA

School of Nursing T201 -2211 Wesbrook Mall Vancouver, BC Canada V6T 1X4 Phone 1-604-822-7437 www.nursing.ubc.ca

COVER LETTER and CONSENT INFORMATION for the SURVEY

The Impact of Nurse Work Environment in Saudi Arabia

Study Team xxxxxxx

Hello,

My name is Amal Alharbi and I am a student in the Master of Science in Nursing program at the University of British Columbia (UBC) in Vancouver, Canada.

You are invited to take part in a research study to investigate nurses' perceptions of their work environment, their job satisfaction, and quality of patient care. Online surveys will be used to collect data from all registered nurses who provide direct care to patients in inpatient units or outpatient clinics. To date, most of the research on nurse work environments been conducted in the United States and Europe, with very little emanating from Saudi Arabia or the Middle East.

Study Procedures - What are we asking you to do?

If you decide to take part in this research study, your participation will involve filling out an online survey. It will take approximately 20 to 25 minutes to complete the survey.

Study Results

The results of this study will be published in academic journals and available to the public through the UBC Library as part of my thesis.

Potential Risks and Benefits from Participating in the Study

There are no known risks from participating in this study. This project is not expected to offer you any direct benefits. However, study results may help to improve nurses' work environments, and nurse and patient outcomes.

Confidentiality

All responses are anonymous and will be treated confidentially. Your name and other personal identifiers are not required in any of the responses; you may choose to not answer any particular question. Participant characteristics will only be used to describe the overall sample, and will not be used in any way to identify individual participants. All documents will be identified only by a case ID number that will not be linked to your name, email address, employer number, or IP address.

The online questionnaire will be hosted by Hospital information technology (IT) department server. Only staff in the IT department will have access to the data and only for the purpose of transferring the data to the research team; administrators at the hospital have stated that confidentiality of the data will be maintained within the IT department. After the survey is complete, the data will be sent securely to the research team in Canada via an encrypted, password protected external hard drive, and the data on the server will be permanently deleted from the hospital server under the supervision of the Director of the IT department.

Data will then be stored on a password protected research computer at the University of British Columbia, School of Nursing in Vancouver, Canada and will be accessible only to the research team identified on the ethics applications.

If you choose to complete the raffle form, you will send your contact information directly to the research team so that it is kept confidential and separate from the survey responses. The information on your raffle form will be used solely to determine and contact the winners.

Incentives

As a token of our appreciation for your time, you will have the chance to win one of the ten SR100 gift cards. After you have completed the online survey, we ask that you send an email to the principal investigator of research team to enter the raffle. (A sample email message is provided at the end of the questionnaire.) Personal information provided for the raffle will not be linked in any way to your completed survey, and will be deleted within 60 days after the raffle is completed. Participation in the raffle is completely optional.

Contact for Information about the Study

If you have any questions or need further clarification about the study, please contact a member of the study team. Their names and telephone numbers are listed on the first page of this form.

Contact for Complaints

The UBC Behavioural Research Ethics Board has issued certificate [H17-00219] for this study. If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail RSIL@ors.ubc.ca or call toll free 1-877-822-8598.

Participant Consent

Your participation is entirely voluntary. You may choose not to participate and you can withdraw from the study at any time during completion of the online survey prior to pressing the 'submit' button. However, once the completed survey is submitted, responses cannot be withdrawn as we have no way of linking the survey with the person who submitted it.

Completing and submitting the survey will indicate your willingness to participate in this study, and it will be assumed that consent has been given.

INSTRUCTIONS FOR COMPLETING THE SURVEY

Please go to the survey at xxxx {hyperlink}.

Follow the instructions on the screen to complete the survey online. The survey will take 20-25 minutes to complete.

*For questions or other concerns, please contact The Principal Investigator by email at <u>xxxxxxxx</u> or by phone at xxxxxxxxx

Thank you for considering participating in this survey, xxxxxxx

Section (A): A FEW QUESTIONS ABOUT YOU:

A1. You identify as:

- o Male
- o Female
- Prefer not to disclose

A2. Age in years: _____

A3. Are you ...?

- Married
- o Single
- \circ Widowed
- o Divorced
- Prefer not to disclose

A4. What is your nationality?

- o Saudi
- o Non-Saudi

A5. In what country did you receive your basic nursing qualification (education)?

- o Saudi Arabia
- o Other Middle Eastern country
- o Philippines
- o India
- If other, please specify ______

A6. What is your current professional classification with the Saudi Commission for Health Specialties?

- Nurse specialist
- o Nurse technician
- If other, please specify _____

A7. What is the highest educational qualification that you have completed?

- Diploma in nursing (2 years)
- High-diploma in nursing (3 years)
- Baccalaureate degree in nursing (BSN-RN)
- Master's degree in nursing
- Master's degree, other than in nursing
- Other, please specify

A8. What is your primary nursing role?

- o Staff nurse (SNI, II, III), Direct Patient Care
- o Nurse Manager, Head Nurse, Clinical Service Manager
- o Nurse Educator
- Other, please specify.....

A9. What is your primary area of nursing practice?

- o Ambulatory Care
- o Critical Care, Intensive Care
- o Emergency
- o Medical
- o Medical-Surgical
- o Surgical
- o Oncology
- o Operating Room, Recovery
- o Palliative
- o Psychiatry
- o Women's Health and Paediatrics
- Other, please specify _____

A10. How many years have you worked?

Note: Only report months if you have worked for less than 1 year.

As a nurse?	Years	Months
As a nurse at this hospital?	Years	Months
As a nurse in your current unit?	Years	Months

Section B:

THE FOLLOWING QUESTIONS ARE ABOUT YOUR JOB IN YOUR CURRENT UNIT (where you work the most hours)

B1. Please indicate the extent to which you agree/disagree that each of the following features is present <u>in your current unit</u>.

	1 =	2 =	3 =	4 =
	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
1. Adequate support services (e.g., porters, housekeeping) that allow me to spend time with my patients.				
2. Physicians and nurses have good working relationships.				
3. A Head Nurse or Clinical Service Manager who is supportive of nurses.				
4. Active staff development or continuing education programs for nurses.				
5. Career development or promotion opportunities				
6. Opportunity for staff nurses to participate in policy development.				
7. Supervisors use mistakes as learning opportunities, not criticism.				
8. Enough time and opportunity to discuss patient care problems with other nurses.				
9. Enough registered nurses to provide quality patient care.				
10. A Head Nurse or Clinical Service Manager who is a good manager and leader.				
11. A Director of Nursing who is highly visible and accessible to staff.				
12. Enough staff (i.e., nurses and health care assistants) to get the work done.				
13. Praise and recognition for a job well done.				

	1 = Strongly Disagree	2 = Somewhat Disagree	3 = Somewhat Agree	4 = Strongly Agree
14. High standards of nursing care are expected by nursing administration.				
15. A corporate nursing director equal in power and authority to other top- level hospital administrators.				
16. A lot of teamwork between nurses and physicians.				
17. Opportunities for professional advancement.				
18. A clear philosophy of nursing is present throughout the patient care environment.				
19. Nurses are clinically competent.				
20. A Head Nurse who backs up the nursing staff decision-making, even if the conflict is with a physician.				
21. Administration that listens and responds to employee concerns.				
22. An active quality improvement programme.				
23. Staff nurses are involved in the internal governance of the hospital (e.g., practice and policy committees).				
24. Collaboration (joint practice) between nurses and physicians.				
25. A preceptor program for newly hired registered nurses.				
26. Nursing care is based on a nursing rather than a medical model.				
27. Staff nurses have the opportunity to serve on hospital and nursing department committees.				
28. Nursing administrators consult with staff on daily problems and procedures.				
29. Written up-to-date plans for all patients.				
30. Patient care assignments that foster continuity of care (i.e. the same nurse cares for the patient from one day to the next).				
31. Use of nursing diagnoses				

Section C:

C1. How satisfied are you with your current job?

- 1. Very dissatisfied
- 2. Moderately dissatisfied
- 3. Slightly dissatisfied
- 4. Slightly satisfied
- 5. Moderately satisfied
- 6. Very satisfied

C2. In the next year, how likely is it that you will leave your current job?

- 1. Very unlikely
- 2. Somewhat unlikely
- 3. Somewhat likely
- 4. Very likely

C3. If you answered somewhat likely or very likely, what are your main reasons for leaving?

Check all that apply:

- o Retirement
- Career advancement
- o Career change
- More time with family
- Health problems
- Physical demands of nursing
- Too much responsibility
- Inability to provide safe, competent care
- o Burnout
- o Poor salary
- Workload
- Management practices
- Conflict with management
- Lack of respect
- Other, please specify _____

C4. How satisfied are you with being a nurse, without taking into consideration your current job?

- 1. Very dissatisfied
- 2. Moderately dissatisfied
- 3. Slightly dissatisfied
- 4. Slightly satisfied
- 5. Moderately satisfied
- 6. Very satisfied

C5. Please choose the response that best describes <u>how frequently</u> you have each feeling in relation to your current job in this hospital.

	0 = Never	1 = A few times a year or less	2 = Once a month	3 = A few times a month	4 = Once a week	5 = A few times a week	6 = Every day
1. Feel emotionally drained from work							

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Section D:

D1. In general, how would you describe the <u>quality of nursing care</u> delivered to patients on your unit?

- 1. Very poor
- 2. Poor
- 3. Fair
- 4. Good

- 5. Very good
- 6. Excellent

D2. Please give your unit an overall grade on patient safety.

- 1. Very poor
- 2. Poor
- 3. Acceptable
- 4. Good
- 5. Very good
- 6. Excellent

D3. The following questions ask for your opinion about patient safety issues on your unit. Please indicate the extent to which you agree/disagree that each of the following features is present <u>on</u> <u>your unit.</u>

	1 =	2 =	3 =	4 =	5 =
	Strongly Disagree	Disagree	Neither disagree/ nor agree	Agree	Strongly Agree
1. Staff feel like their mistakes are held against them.					
2. Important patient care information is often lost during endorsement.					
3. Things get overlooked or forgotten when transferring patients from one unit to another.					
4. Staff feel free to question decisions or actions that may impact patient safety, even if made by persons in authority					
5. In this unit we discuss ways to prevent errors from happening again.					
6. We are given feedback about changes put into place on event reports (e.g. incident reports)					
7. The actions of hospital administration show that patient safety is a top priority.					

D4. <u>Over the past year</u>, how often would you say each of the following incidents have occurred to your patients <u>on your current unit?</u>

	0 = Very rarely/Never	1 = A few times a year	2 = Once month or less	3 = A few times a month	4 = Once a week	5 = A few times a week	6 = Every day
1. Patient received wrong medication, time or dose							
2. Patient developed pressure ulcers after admission							
3. Patient falls with injury							

Section E: This section asks about additional work conditions influencing nurses' workload. Please answer the following sections in regard <u>to your current unit</u>, by selecting the best response.

E1. Over the past month, on average, how would you rate your patients' acuity level? (Acuity = amount of skilled nursing care required.)

- 1. Not at all acute
- 2. Slightly acute
- 3. Slightly to moderately acute
- 4. Moderately acute
- 5. Very acute

E2. Over the past month, on average, how would you rate the <u>complexity</u> of your patients' health care status and nursing care needs?

- 1. Not complex or minimally complex: Straightforward, typical presentation; routine patient/family dynamics
- 2. Minimal to moderate complexity
- 3. Moderate complexity

- 4. Moderate to high complexity
- 5. Highly complex: atypical/ambiguous presentation; complex patient/family dynamics

E2.1. Over the past month, on average, how would you rate your patient's <u>vulnerability</u> or susceptibility to actual or potential stressors that may negatively affect their health outcomes?

- 1. Very low vulnerability: Safe, not fragile
- 2. Minimal to moderate vulnerability
- 3. Moderate vulnerability
- 4. Moderate to high vulnerability
- 5. Highly vulnerable: Susceptible, very fragile, unprotected

E2.2. Over the past month, on average, how would you rate your patients' <u>resiliency</u>, that is, their capacity to recover from their health condition (i.e., illness, injury or surgery)?

- 1. Very little or no resiliency: Unable to initiate a response to cope with their injury or health condition
- 2. Minimal to moderate resiliency
- 3. Moderate resiliency
- 4. Moderate to high resiliency
- 5. Highly resilient: Able to initiate and maintain a response; high level of endurance

E2.3. Over the past month, on average, how would you rate your patients'<u>predictability</u> (i.e., how certain or uncertain you were that patients would follow a certain course of events or course of illness?

- 1. Very low predictability: highly uncertain, uncommon illness; very unusual or unexpected course; did not follow critical pathway
- 2. Minimal to moderate predictability
- 3. Moderate predictability
- 4. Moderate to high predictability
- 5. Highly predictable: highly certain; common wellness; usual and expected course; follows critical pathway

E3. Over the past month, on average, how would you rate your patients' dependency level?

(Dependency= amount of support required for activities of daily living.)

- 1. Very independent
- 2. Somewhat independent
- 3. Somewhat dependent
- 4. Moderately dependent
- 5. Very dependent

E4. Select the response that best describes the most recent shift you worked on your current unit?

- 1. Day
- 2. Night
- 3. Other, please specify...

E5. How many patients are you usually assigned when you work day shifts?

Number of patients = _____

E6. How many patients are you usually assigned when you work night shifts?

Number of patients = _____

E7. On your most recent shift, please indicate which of the following activities were (a) required and left undone, (b) required and completed, or (c) not required.

	Required and left undone	Required and completed	Not required
1. Adequate patient surveillance			
2. Skin care			
3. Oral hygiene			
4. Pain management			
5. Comfort/talk with patients			
6. Educating patients and family			
7. Treatment and procedures			
8. Administer medications on time			
9. Prepare patients and families for discharge			
10. Adequately document nursing care			
11. Develop or update nursing care plans			

	Required and left undone	Required and completed	Not required
12. Planning care			
13. Frequent changing of patient position			

THIS IS THE END OF THE SURVEY. THANK YOU VERY MUCH FOR TAKING PART IN THE SURVEY.

Note: If you would like to join the raffle, please send an email as directed below. The winner will be notified by email and provided with information on where to pick up the prize.

TO ENTER THE RAFFLE:

Send email to: <u>.....</u> Subject Line: XXXX Nurse Survey Raffle

I wish to enter my name in the raffle for the Impact of Nurse Work Environment in Saudi study.

Name:

Email address:
Appendix E: Summary of Concepts and Operational Definitions

Concept	Variable	Operational Definition	Example Question					
Key Predictor Variable								
Nurse Work Environment	PES-NWI subscales	 PES-NWI consisted of 31 items measured on a 4-point response scale. Mean subscale scores were computed for each subscale with higher scores indicating a higher quality work environment. Nurse Participation in Hospital Affairs Nursing Foundation for Quality Care Nurse Manager, Leadership, And Support for Nurses Staffing and Resources Adequacy Collegial Nurse–Physician Relations 	 Examples of items from each subscale (in order) are: "opportunity for staff nurses to participate in policy decisions;" "provision of active continuing education programs for staff nurses;" "supervisors use mistakes as learning opportunities, not criticism;" "enough registered nurses to provide quality patient care;" and "a lot of teamwork between nurses and physician". 					
Key Outcome Variables								
Nurse Outcomes	Job satisfaction	A single-item question, asked nurses to identify their overall satisfaction with current job. Answers were measured on a 6-point Likert scale. Scores were dichotomized as <i>very</i> <i>dissatisfied to slightly satisfied</i> (0) versus <i>moderately or very satisfied</i> (1).	How satisfied are you with your current job?					

Concept	Variable	Operational Definition	Example Question						
Key Outcome Variables									
	Burnout- Emotional Exhaustion (EE)	EE consisted of 9 items measured on 6-point response scale using the Emotional Exhaustion (EE) subscale of the Maslach Burnout Inventory – Human Service Scale (MBI-HSS). Scores were dichotomized as (0) <i>low burnout</i> with scores ranging from 0 to 26 versus (1)	An example item is " <i>I feel emotionally drained</i> by my work".						
		<i>high burnout</i> with scores that are equal or more than 27 on the EE scale.							
	Intent to leave	A Single-item question, asked nurses to report whether they would leave their current job within the next year. Answers were measured on a 4-point Likert scale. Scores were dichotomized to (0) very unlikely to somewhat unlikely versus (1) somewhat likely or very likely.	In the next year, how likely is it that you will leave your current job?						
Patient Outcomes	Overall nurse perceived quality of patient care	A Single-item question, asked nurses to rate the overall quality of care delivered to their patients on last shift. Answers were measured on 6-point response scale. Scores were dichotomized as (0) very poor to good versus (1) very good or excellent.	In general, how would you describe the <u>quality</u> of nursing care delivered to patients on your unit?						

Concept	Variable	Operational Definition	Example Question					
Key Outcome Variables								
Patient Outcomes	Overall nurse- perceived patient safety	A Single-item question, asked nurses to rate the overall safety of care delivered to their patients on last shift. Answers were measured on 6-point response scale. Scores were dichotomized as (0) very poor to good versus (1) very good or excellent.	Please give your unit an overall grade on <u>patient</u> <u>safety</u> ?					
	Patient adverse events	 Nurses were asked to indicate the frequency of occurrence of 3 adverse events on their primary unit during the past year, measured on a 6-point response scale. An aggregated score of the 3 adverse events, with possible scores ranging from 0 to 18. Patient received wrong medication, time or dose Patient developed pressure ulcers after admission Patient falls with injury 	Over the past year, how often would you say each of the following incidents have occurred to your patients <u>on your current unit?</u>					

Appendix F: Chi-Square Results for Differences in Outcome Variables Based on Country

	Philippines	India	Saudi or Other	
Outcomes	(n = 299)	(n = 165)	(n = 28)	
	n (%)	n (%)	n (%)	χ²
Job satisfaction				
Very dissatisfied to slightly satisfied	134 (45.3)	33 (20.4)	6 (22.2)	30.54*** (2, 485)
Moderately or very satisfied	162 (54.7)	129 (79.6)	21 (77.8)	100)
Emotional exhaustion				
Low or medium burnout	144 (50.3)	102 (71.8)	17 (60.7)	18.05*** (2, 456)
High burnout	142 (49.7)	40 (28.2)	11 (39.3)	-50)
Intent to leave				
Very unlikely to somewhat unlikely	104 (35.3)	93 (57.4)	16 (59.3)	23.53*** (2, 484)
Somewhat fixery of very fixery	191 (64.7)	69 (42.6)	11 (40.7)	
Quality of care				
Very poor to good	99 (33.2)	20 (12.3)	8 (28.6)	24.16*** (2, 489)
very good of excellent	199 (66.8)	143 (87.7)	20 (71.4)	
Patient safety				
Very poor to good	80 (26.9)	22 (13.5)	4 (14.3)	12.15** (2, 488)
Very good or excellent	217 (73.1)	141 (86.5)	24 (85.7)	

Table 4.12. Between group differences in Outcome Variables based on Country

Note. ***p* < 0.01, ****p* < 0.001.