2014-07-01

Nurse Practice Environment and Peripheral Intravenous Infiltrations in a Pediatric Hospital on the Magnet Journey

Jannise Topacio Baclig PhD
University of San Diego

UNIVERSITY OF SAN DIEGO

Hahn School of Nursing and Health Science

DOCTOR OF PHILOSOPHY IN NURSING

NURSE PRACTICE ENVIRONMENT AND PERIPHERAL INTRAVENOUS INFILTRATIONS IN A PEDIATRIC HOSPITAL ON THE MAGNET JOURNEY

by

Jannise Topacio Baclig

A dissertation presented to the

FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE

UNIVERSITY OF SAN DIEGO

In partial fulfillment of the

requirements for the degree

DOCTOR OF PHILOSOPHY IN NURSING

July 2014

Dissertation Committee

Linda D. Urden, DNSc, RN, CNS, NE-BC, FAAN, Chairperson

Cynthia D. Connelly, PhD, RN, FAAN

Laurie A. Ecoff, PhD, RN, NEA-BC

Abstract

Background: Characteristics such as quality patient care, excellence in nursing, and innovations in professional nursing practice shape a health care organization into a "magnet" organization. Magnet designation is a key aspect of nursing, which places pressure on healthcare organizations to commit to nursing excellence and patient care should they take the challenge of attaining this prestige. With growing focus on quality and safety, nursing needs to remain diligent in ensuring a healthy work environment that not only supports the profession, but also sustains exceptional patient outcomes. The purpose of this research study was to describe the relationship of the nurse practice environment and peripheral intravenous (PIV) infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.

Methods: A descriptive correlational design with an on-line self-administered nurse survey was used for the study. The research setting took place in a large urban stand-alone, pediatric teaching hospital located in Southern California. The sampling plan included purposive, non-randomized sampling of eligible nurses who spent at least 50% of their time in direct patient care in any of the selected five types of inpatient units, with a minimum of six months employment on their current unit. An on-line self-administered nurse survey was sent to an estimated 400 nurses during August/May 2014. The study measures were organized into 3 dimensions: PIV infiltrations, Nurse Attributes, and Nurse Practice Environment. Descriptive and inferential statistics were conducted using SPSS version 22.

Results: The research findings from this study indicated there were several statistically significant relationships with PIV infiltrations, Nurse Attributes, and the

Nurse Practice Environment. Data showed that a nurse who works on the Medical Inpatient Units has a higher proportion of experiencing PIV infiltrations, as well as not experiencing PIV infiltrations. Subsequently, the PES-NWI subscale score by nursing unit presented statistically significant differences in one or more of the nursing units in 4 of the 5 PES-NWI subscales. Overall, the PES-NWI composite mean score was 2.87, which indicated that nurses were generally satisfied with their work environment in their current job. Additionally, Nursing Unit and Years as RN on Primary Unit indicated a statistically significant association with PIV infiltrations. This supports the inference that the unit on which the nurse works does matter in relation to experiencing or not experiencing PIV infiltrations.

Conclusions: This study highlighted the importance of how the nurse practice environment and nursing-sensitive indicators contribute to pediatric patient-centered outcomes for hospitals on the Magnet journey. Focusing on measures that matter to consumers will enhance the success of healthcare organizations in supporting important quality initiatives for continuous improvement, and sustainability of nursing work culture and patient outcomes. The study findings can also help us better understand the associations amongst the nurse practice environment and patient outcomes, and provide a framework for nursing and their professional impact and responsibilities in addressing current and future healthcare demands.

This Page Intentionally Left Blank

Dedication

This is dedicated to my children – Leila, Jonah, and Mason.

This has been a journey you've taken with me since you were all born. Watching you grow with courage, enthusiasm and spirit made all of this possible. For nothing is impossible without faith, love and the hope for a bright and promising future. You are my heart and I love you more than you'll ever know.

Preface, with acknowledgments

This has been an intense labor of love and there are so many people that have showered me with encouragement, confidence, love, support and advice towards achieving this milestone, to only some whom it is possible to give mention here.

To my Lord and Savior for all things are not possible without Him.

To my husband and Soulmate, Rob – We earned this together! I cannot begin to describe the love, respect and admiration I have for you. Thank you for always being there. Life as I know it today wouldn't be a life worth living without you. I love you, forever and always.

To my children, Leila, Jonah and Mason – You are all the reason I breathe. I hope this accomplishment serves as an inspiration to you and that you will approach life with purpose, fervor, and compassion. Remember, you *can* and you *will*...nothing is impossible.

To my parents, Idelfino and Liwayway Topacio - Thank you for paving the road of opportunity for our family and providing valuable life lessons that my children will also learn. What I will never forget are the late hours, countless weekends, and unexpected times you've helped in infinite ways to make sure I stayed the course. Your love, support and guidance allowed me to live a life without regret.
God + Family = A Life Fulfilled.

To my brothers, Dee, Jay and Jeff – You all kept it real...laughter *is* the best medicine. What I will always keep close to my heart is how wonderful you are to my children...you are the BEST uncles ever!

To the Baclig Family, especially my father-in-law and mother-in-law, Ron and Belinda Baclig – I appreciate the unconditional love and support you've given to our family. Thank you so much for giving so much of yourselves to us.

To my Bestie, Suzy – You have been my biggest cheerleader! Thank you for being there and for always saying the right thing when I needed to hear it the most. You truly hold my deepest admiration, for you are an extraordinary Nurse and most importantly, an amazing and courageous Woman.

To my SistaFrens, B, Vida, Mar, Kat, San, Charm, Mis and Jenn – Those GNO's saved me. Thank you for being the sisters I never had. Our times together helped me escape reality and laugh like there was no tomorrow. You each hold a very, very special place in my heart. JASGP '93 - *Once a Tiger, Always a Tiger!*

To my Rady Children's Work Family, especially my Ortho/Rehab Peeps –Thank you for taking a chance on me as a new grad nurse. I am so very thankful for your unwavering support and commitment in helping me develop and enhance my nursing career. Words truly cannot express my gratitude for all that you've done for me. After all, I *"would be nothing without you!"*

To my Dissertation Committee, Dr. Urden, Dr. Connelly and Dr. Ecoff – You have been so patient, encouraging and committed to my educational success. Thank you for believing in me. I only hope I am able to pay it forward and provide the best of who I am as a Professional Nurse and Nurse Scientist, as you have all done for me.

To the University of San Diego Hahn School of Nursing and Health Science Faculty and Staff – Thank you so much for providing nurses like me the opportunity to

pursue our educational endeavors. You have all made it possible for me to balance family, life, work, and school because of your compassion and encouragement.

A sincere Thank You to everyone I was not able to mention, as it would take a lifetime to do so. It truly takes a village and I appreciate you.

Table of Contents

List of Tables

List of Illustrations (Figures)

List of Appendices

Chapter 1

Introduction

There are many factors that contribute to the success of a health care organization, but there are distinctive characteristics that differentiate a good organization from an extraordinary one. Characteristics such as quality patient care, excellence in nursing, and innovations in professional nursing practice shape a health care organization into a "magnet" organization. The term "magnet" is derived from organizations that are able to attract nurses in their recruitment and retention efforts (American Nurses Credentialing Center [ANCC], 2014). The impression a magnet hospital confers on its consumers, as well as its competitors, is one of exceptional service and perpetual commitment in nursing care.

Health care organizations seek continuous improvements in nursing quality, excellence, and service. The goals of the magnet program challenges organizations to 1) promote and maintain quality professional practice, 2) identify and achieve excellence in the delivery of care, and 3) share and uphold nursing best practices (ANCC, 2014). By achieving magnet recognition, hospitals are designated with one of the highest honors

bestowed upon health care organizations. This is why the magnet program separates quality organizations from those that are average or standard.

An enhanced nurse practice environment plays a major role in magnet designation. The nurse practice environment is defined as "the organizational characteristics of a work setting that facilitate or constrain nursing practice" (Lake, 2002). Since the nursing workforce is the largest in the health care industry where the demand for health care is 24/7, maintaining a high-quality nurse practice environment is essential. Lundmark's (2008) systematic review of *Magnet Environments for Professional Nursing Practice* identified most nurse practice environment studies involve nurse outcomes such as the nursing shortage, nurse job satisfaction, nurse burnout, nurse turnover, and nurse staffing (Lake & Friese, 2006; Ulrich, Buerhas, Donelan, Norma, & Dittus, 2007; Stone & Gershon, 2009; Stone et al., 2009). Indeed few studies on patient specific outcomes variables appear in magnet research. Consequently, there is still more to be investigated in magnet hospitals, nurse practice environments, and their association to patient-centered outcomes.

Peripheral Intravenous (PIV) Outcomes – A Nurse Sensitive Indicator

PIV outcome is considered a nursing-sensitive indicator because it is exclusively affected by nursing practice in the delivery of patient care (Lacey, Klaus, Smith, Cox, & Dunton, 2006), notably both assessment and maintenance of a patient's PIV is an evident nursing responsibility. Little is known about the linkage with pediatric patient outcomes, particularly peripheral intravenous (PIV) infiltrations and nurse work environments in hospitals on the magnet journey. Indeed, few studies have been published on PIV infiltrations in the pediatric setting. Those that are prominent in the literature are dated

yet still pertinent because studies in this area are very limited. Of these studies, most have focused on duration of PIVs, frequency of PIV changes, and associated complications. However, there has been no published evidence found regarding the role of nurses and the nurse work environment to PIV infiltrations. The need for pediatric-outcomes focused research including PIV infiltrations is compelling.

Background

The inception of the Magnet Recognition Program® in 1994 by the ANCC helped define an organization's culture and magnitude of care. As a gold standard in nursing care, this program is monumental in it recognizes organizations that deem the nursing profession as a high priority will succeed on many levels (Mason, Leavitt, & Chaffee, 2002). There are multiple facets of what an organization must do to apply for magnet designation. It is not only about the quality of patient care and nursing services, but about the people, processes, and programs in place to create a higher level of commitment in providing and sustaining superb health care. Ultimately, the structure, process, and empirical outcomes that define nursing quality care are important elements of nurse practice environments and the magnet culture.

Nationally, there has been an increased interest in the preservation of healthy nurse work environments. In 2003, the Institute of Medicine (IOM) published a report identifying the importance of safeguarding patients amidst a challenging nurse work environment. In 2005, the American Association of Critical-Care Nurses (AACN) published the "AACN Standards for Establishing and Sustaining Healthy Work Environments." These standards were created to promote and support healthy work environments in order to sustain quality patient care. Then, in 2008, the National

Advisory Council on Nurse Education and Practice (NACNEP) also identified the escalating challenges faced in nurse work environments. In this report, NACNEP supported strategies to further develop the nurse work environment to augment retention, safety, nurse and patient satisfaction, productivity, and patient outcomes (NACNEP, 2008). Furthermore, (TJC), an independent, non-profit organization that serves as an accreditation and certification body to a plethora of hospitals nationwide, submitted a testimony to the Robert Wood Johnson Foundation with recommendations to address ways to elevate the quality and delivery of patient care (2010). Of those recommendations, the improvement of the nurse work environment warranted reform.

Purpose of Study

The purpose of this research this study was to describe the relationship of the nurse practice environment and peripheral intravenous (PIV) infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey. This will be accomplished through the following research aims:

Research Aims

1. Characterize nurses' attributes, nurse practice environment, and peripheral intravenous (PIV) infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.
2. Examine the relationships between potential predictors (nurses' attributes, nurse practice environment), and PIV infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.
3. Examine factors that increase the odds of PIV infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.

Research Questions

1. Is there a statistically significant difference in the proportion of PIV infiltrations by nursing unit?
2. Is there a statistically significant difference in PES-NWI subscale score by nursing unit?
3. Is there a statistically significant difference in PES-NWI score by PIV infiltration status?
4. Are nurse attributes and the nurse practice environment related to PIV infiltrations?

Conceptual Framework

ANCC's Magnet Recognition Program Model® was used as the basis for the conceptual model of this study. The five model components – Transformational Leadership; Structural Empowerment; Exemplary Professional Practice; New Knowledge, Innovations, Improvements; and Empirical Outcomes contain the subconstructs of the original 14 Forces of Magnetism. Embedded in those 14 Forces of Magnetism are the variables used in this study, which are outlined further in Chapter 3. The study variables are concepts of the overall magnet model. A cyclic pathway is formulated as a hospital on the Magnet journey is an overarching construct associated with the 5 subscales of the Practice Environment Scale of the Nursing Work Index (PES-NWI) survey, that are connected to the 14 Forces of Magnetism, and to the 5 model components. A hospital on the Magnet journey and the 5 subscales together form a linkage to PIV infiltration rates, which in turn are then cycled back into the Magnet model pathway (see Figure 1).

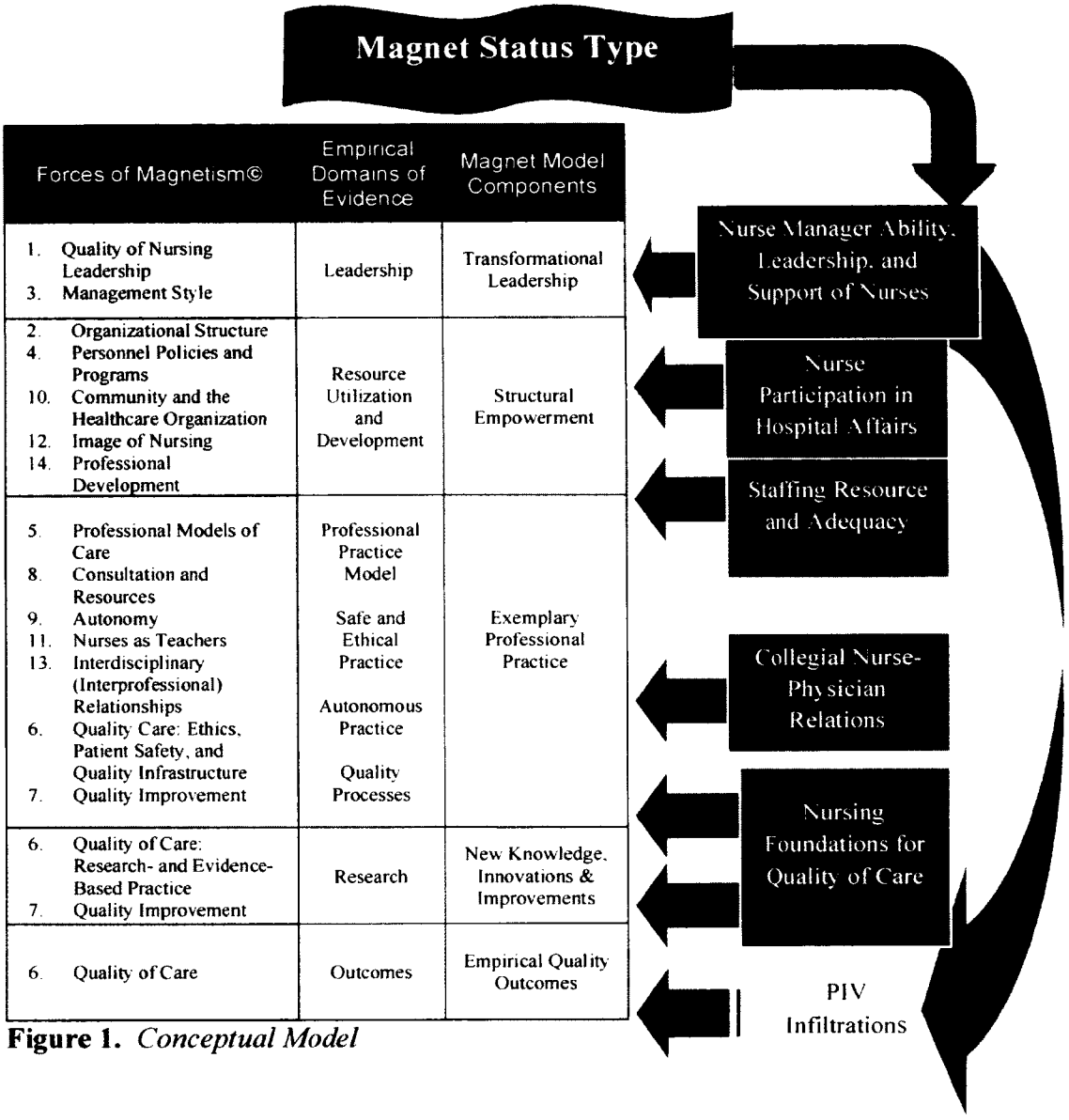

Figure 1. *Conceptual Model*

Significance

Magnet recognition is the gold-standard for organizational and nursing excellence, conducting research on nursing-sensitive indicators and patient-centered outcomes can provide a better understanding of what truly makes an organization a "magnet" for nurses, patients, and the community. Additionally, in order for an organization to monitor and improve performance data, benchmarking itself against other organizations can be a useful tool to determine organizational strengths and weaknesses. Benchmarking provides a blueprint for organizations to assess best practices (Brown, Aydin, & Donaldson, 2008, p. 18). Implications for nursing practice are organizations can gain more insight into trends over time to determine if processes and programs continue to make a difference. Health care organizations can continually monitor their progress and may be able to prioritize performance improvement initiatives. This study has the potential to highlight the importance of how the nurse practice environment and nursing-sensitive indicators contribute to pediatric patient-centered outcomes for hospitals that are on the Magnet journey.

Chapter 2

Review of Literature

Upon review of the literature, nurse practice environments have been addressed in many magnet and non-magnet research studies, but there are few studies that incorporate hospitals on the magnet journey. There have also been limited studies linking magnet status type and work environments to patient outcomes; particularly pediatric patient-centered outcomes.

Magnet Recognition Program®

Magnet Recognition Program® studies began in the early 1980's when there was an extreme nursing shortage nationwide. During this period, the Governing Council of the American Academy of Nursing's Task Force on Nursing Practice in Hospitals was assigned to investigate the qualities that hinders or contributes to professional nursing practice in healthcare organizations (Urden, 2006). The task force's recommendations resulted in a study proposal that was approved by the Governing Council, which included a nomination of 165 hospitals to participate in a voluntary survey to help identify

particular attributes that shape a "magnet" organization. The term "magnet" is derived from organizations that are able to attract nurses in their recruitment and retention efforts (ANCC, 2014). Of those 165 nominations, 155 hospitals responded, yet only 41 institutions were signified as "magnet" (McClure, Poulin, Sovie, & Wandelt, 1983).

From this original study, the ANCC was created as a branch of the American Nurses Association (ANA) for credentialing programs and services. Several years later in 1994, the ANCC designated the University of Washington Medical Center in Seattle, Washington its first Magnet organization. Since its inception, the Magnet Recognition Program® has evolved over time.

The attributes described in the original Magnet study were labeled as the "Forces of Magnetism." The "forces" comprise 14 characteristics that demonstrated lower nurse turnover, higher patient satisfaction, and higher nursing satisfaction (Mason, Leavitt, & Chaffee, 2002). However in 2008, the Magnet model was revised to shape future nursing practice and research, which now consolidates the 14 forces into 5 model components. These new tools provide organizations with a foundational structure in making significant changes and adaptations for the continued development of the nursing profession in improving the quality of patient care and outcomes. Of late, the Magnet Recognition

Program has undergone a second manual revision in 2014, which has changed the dynamics and benchmark expectations of both newly designating and re-designating organizations (ANCC, 2014). This strong focus on clinical outcomes reflects healthcare demands are shifting to demonstrate more tangible evidence for nurses seeking a great place to work, but also for patients seeking a great place to receive care.

There are many advantages to becoming a Magnet designated hospital. Several studies dating from the late 1990's discuss the multitude of evidence collected, outlining the benefits of achieving Magnet recognition. These advantages go beyond the organization and relate to health care consumers, as well as communities. Benefits include improved patient satisfaction, increased quality of inpatient care, higher salaries for nurse managers, recruitment and retention of nurses, financial savings for the organization, reinforced collaborative interdisciplinary relationships, and a significant competitive advantage for the organization (ANCC, 2014). Essentially, Magnet hospitals generate a positive impact at every level of the organization, which makes them stand out from its competitors.

Various empirical studies have utilized the comparison of Magnet versus Non-Magnet facilities; recently the need for inclusion of hospitals on the Magnet journey has been identified. There is still much to learn about hospitals that are making the commitment to organizational excellence and safe, quality patient care; specifically, pediatric hospitals on the Magnet journey, which is why this original research study is significant. It is so important to expand Magnet research to include hospitals that are on the journey; in other words, on a system-level, the organization is seeking to improve and/or embed Magnet characteristics with the ultimate goal of achieving Magnet

designation. After all, this is genuinely what being "magnet" means. It is not only exceptional status that a health care organization acquires, but also an unquestionable paradigm shift in its people, culture, and processes.

Nurse Practice Environment

In the past decade, there has been a markedly increased concern with maintaining healthy nurse work environments. Since the demand for health care continues the demand for expert nursing care continues. Several key organizations have voiced their concern through publications and it is these studies that will be highlighted.

At the close of the 20th century, working conditions in health care became an urgent priority for the Agency for Healthcare Research & Quality (AHRQ) (AHRQ, 2002). AHRQ along with other federal agencies collaborated and created a task force to conduct a gap analysis of what structures or processes need to be in place to improve the working conditions of health care professionals. From this needs assessment, AHRQ received millions of dollars in funding dedicated towards research projects to enhance the health care environment (AHRQ, 2002). With the AHRQ as a visionary leader for this initiative, they charged the Institute of Medicine (IOM) to specifically examine the nurse practice environment.

As part of the Quality Chasm Series and with the support of AHRQ, the IOM published their third report in 2003 identifying the importance of safeguarding patients amidst a challenging nurse work environment. In this report, several factors were reviewed that are considered to negatively impact a healthy nurse work environment: 1) failure to follow management standards and principles for workplace safety, 2) non-standardized, unsafe staffing levels, 3) unsafe workflow processes and work space

design, 4) lack of non-punitive response to error, and 5) reduction in effective leadership practices and support. Within this report, the IOM summarized their recommendations based on those factors. When this report was published, the public became aware of the harsh reality of how unhealthy the nurse work environment was and what it meant for the patients, community, and the nursing profession.

In 2005, the American Association of Critical-Care Nurses (AACN) published the "AACN Standards for Establishing and Sustaining Healthy Work Environments." These standards were created to promote and support healthy work environments in order to sustain quality patient care. This initiative was set forth by the AACN in 2001 and is now one of three prioritized initiatives supported by the AACN. The six standards that were developed include: 1) skilled communication, 2) true collaboration, 3) effective decision-making, 4) appropriate staffing, 5) meaningful recognition, and 6) authentic leadership (AACN, 2005, p.2). With these standards in place, the AACN strives to bring meaning back to nurses' work and their work environment.

Yet another well-known national organization, the National Advisory Council on Nurse Education and Practice (NACNEP) also identified the escalating challenges faced in nurse work environments. In their 2008 report, NACNEP supported strategies to further develop the nurse work environment to augment retention, safety, nurse and patient satisfaction, productivity, and patient outcomes (NACNEP, 2008).

Furthermore, the Joint Commission (TJC), an independent, non-profit organization that serves as an accreditation and certification body to a plethora of hospitals nationwide, submitted testimony to the Robert Wood Johnson Foundation with recommendations to address ways to elevate the quality and delivery of patient care. Of

those recommendations, the improvement of the nurse work environment was mentioned as a need for reform (TJC, 2010).

These studies indicate the healthier the work environment, the better the nursing-centered and patient-centered outcomes will be. For nurses to remain clinically competent and be able to provide safe patient care, the nurse work environment must continue to be a national priority for improvements, especially in forecasting the future of health care. Once again, supporting the need for more studies concerning nursing-centered and patient-centered outcomes to be performed by nursing researchers.

PIV Infiltrations

According to the Infusion Nursing Standards of Practice (2011), peripheral intravenous (PIV) infiltration is defined as "the inadvertent administration of a nonvesicant medication or solution into the surrounding tissue". PIV extravasations are also classified as an infiltration with the main difference being that extravasations occur from "vesicant medication into the surrounding tissue". Both PIV infiltrations and extravasations are considered specific to nursing care because assessment and maintenance of a patient's PIV is an evident nursing responsibility. In the Centers for Disease Control's (CDC) "Guidelines for the Prevention of Intravascular Catheter-Related Infections" (2011), they recommend the frequency of replacing PIV catheters should be every 72 to 96 hours in adult populations to decrease the risk of complications, yet no specific standards exist for pediatric patients unless clinically indicated. Moreover, pediatric patients are especially at increased risk for PIV infiltrations and complications due to their physical size and small vasculature (Lacey, Klaus, Smith, Cox, & Dunton, 2006).

Lee Ann Oishi (2001) conducted a synthesis of the review of literature, which focused on the associated risks of phlebitis and infection, as well as the necessity to routinely replace PIV catheters in children. Of the forty-six articles found, Oishi reviewed and critiqued six of those articles as they specifically focused on duration of PIV catheters in hospitalized children and associated complications. All six articles came to the consensus that following the adult guidelines of changing the PIV catheter every 72 to 96 hours is not necessary as long as there are no signs and symptoms of complications or infection (Oishi, 2001). By replacing PIVs only when necessary in children, it may contribute to decreasing painful and traumatic events associated with hospitalization. Additionally, it was not shown in the various studies that the risk of occurrence of associated complications such as phlebitis and infections increased with duration of PIVs.

This was evident when Shimandle et al. (1999) studied whether or not leaving the PIV catheter in longer than the adult-recommended 72 hours would increase complications. PIV catheters in two pediatric wards were monitored; any PIV catheters that were removed and met the criteria were cultured for organisms. Findings revealed catheter colonization and risks of complications, including catheter sepsis, concurred with similar studies in there was no significant increase in relation to prolonged PIV use.

Correspondingly, a 5-month descriptive, prospective study was performed in an Australian pediatric unit investigating PIV use, management, and complications. All pediatric PIVs inserted were included in the study and were recorded by either a registered nurse or member of the research team. Results also concurred with similar studies regarding risk of complications according to prolonged PIV use (Foster, Wallis, Paterson, & James, 2002).

Indeed, few studies have been published on PIV infiltrations in the pediatric setting. Those that are prominent in the literature are dated yet still pertinent because studies in this area are very limited. Of these studies, most have focused on duration of PIVs, frequency of PIV changes, and associated complications. However, there has been no published evidence found regarding the role of nurses and the nurse work environment to PIV infiltrations. Thus, the need for pediatric-outcomes focused research such as PIV infiltrations has been identified as an important nursing-sensitive indicator.

Conceptual Framework

This study will be grounded in a conceptual framework that describes the relationships between magnet status, the nurse work environment, and Magnet hospital characteristics. ANCC's Magnet Recognition Program Model® was used as the basis for the conceptual model of this study. The five model components – Transformational Leadership; Structural Empowerment; Exemplary Professional Practice; New Knowledge, Innovations, Improvements; and Empirical Outcomes – was developed in 2008 to encompass the subconstructs of the original 14 Forces of Magnetism (ANCC, 2014). Embedded in the five model components are the variables used in this study, which are outlined further in Chapter 3. The study variables are concepts of the overall magnet model.

The conceptual model describes the overarching construct of a hospital on the Magnet journey. Hospitals seeking Magnet designation, whether initial or re-designation, are held to the same national standards and benchmarks with a weighted emphasis on empirical outcomes (ANCC, 2014). To further examine those characteristics that are deemed "magnet", the five subscales of the Practice Environment Scale of the Nursing

Work Index (PES-NWI) survey are expressed to display an association to the five model components centered on patient outcomes on the unit and organizational levels. In this case, the specific patient outcome is documented incidence of PIV infiltrations (Lake, 2002). Essentially, this conceptual model demonstrates how a hospital on the Magnet journey, nurse work environment, and patient outcomes will contribute a better understanding of the link that nursing-centered outcomes and patient-centered outcomes contribute to the Magnet model (see Figure 1).

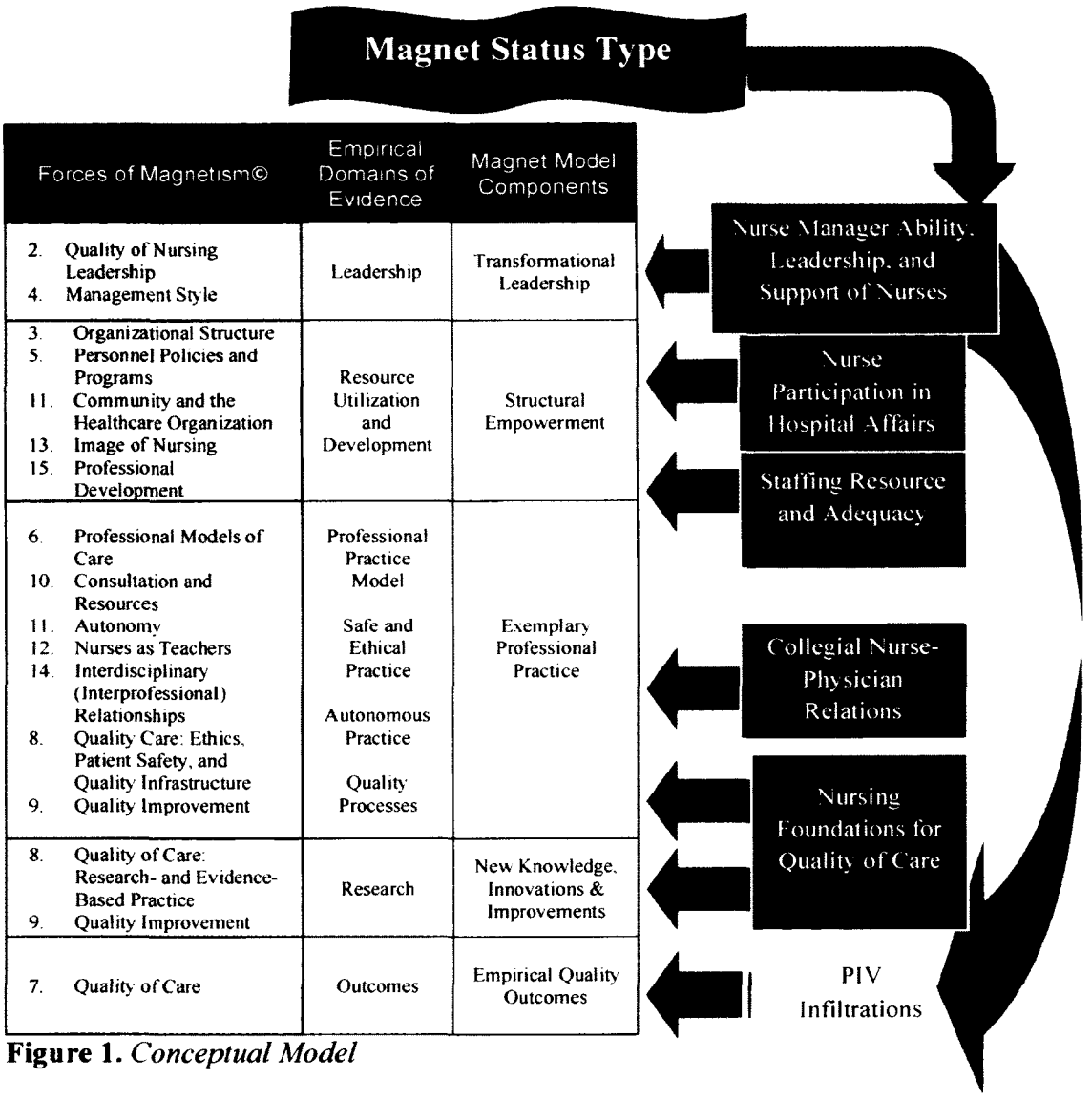

Figure 1. *Conceptual Model*

Chapter 3

Methodology

The purpose of this research this study was to describe the relationship of the nurse practice environment and peripheral intravenous (PIV) infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey. This chapter includes a description of the design, sample and sampling, data collection, and analytic procedures. The protection of human subjects is also presented.

Specific Aims: 1. Characterize nurses' attributes, nurse practice environment, and peripheral intravenous (PIV) infiltration rates in a large urban stand-alone, pediatric teaching hospital on the Magnet journey; **2.** Examine the relationships between potential predictors (nurses' attributes, nurse practice environment), and PIV infiltration rates in a large urban stand-alone, pediatric teaching hospital on the Magnet journey; and **3.** Examine factors that increase the odds of PIV infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.

Design

A descriptive correlational design with an on-line self-administered nurse survey was used for the study (Creswell, 2014). A correlational design is used to establish that a relationship exists between two variables, and is often used as a foundation for later experimental or quasi-experimental studies (Wood & Ross-Kerr, 2011). Because the area of interest was to describe relationships and quantify the predictive capabilities of multiple independent variables on a single dichotomous dependent variable, logistic regression analysis was performed.

Operational Definitions of Variables:

PIV Infiltrations: According to the Infusion Nursing Standards of Practice (2011), PIV infiltrations are the "inadvertent administration of a nonvesicant solution or medication into the tissue surrounding the IV catheter, whereas extravasations are the inadvertent administration of a vesicant medication into the surrounding tissue." Extravasations were included as part of this measure because the patient outcome remains the same despite the difference in the type of medication administered – nonvesicant vs. vesicant.

Nurse Attributes: age, gender, race/ethnicity, role, work status, primary unit, years employed on primary unit, highest level of nursing education, nursing certification and Magnet facility.

Nurse Practice Environment: "the organizational characteristics of a work setting that facilitate or constrain nursing practice" (Lake, 2002).

The dependent variable (DV) under study was peripheral intravenous (PIV) infiltrations. PIV infiltrations were determined by whether or not the reason for removal of a PIV was due to infiltration or extravasation. Two types of reporting methods were used to explore PIV infiltrations and analyses were run separately to consider the relationship of the independent variables with the outcome variable based on the research questions. One reporting method was explored using a computer-generated reported titled "Stat Lock Compliance Report". The other reporting method was determined by the response to the single question, "on your primary unit, please provide the total number of PIV infiltrations, regardless of grade severity, that have occurred under your care in the past 6 months (October 2013-March 2014)" rated as a string variable where participants provided a number or open text.

The independent variables (IV) of interest were the nurse attributes: age, gender, race/ethnicity, role, work status, primary unit, years employed on primary unit, highest level of nursing education, nursing certification and Magnet facility; and the scores from the five subscales of the nurse Practice Environment Scale of the Nursing Work Index (PES-NWI) survey. All variables are outlined in Table 1.

Table 1. *Variables*

Dimension	Variables	Measures	Data Source
PIV Infiltrations	1. PIV Infiltrations – report 2. PIV Infiltrations – survey	a) Total number of PIV Infiltrations from October 2013 to April 2014 b) Self-reported PIV infiltrations per respondent	a) Computer-generated report b) On-line survey
Nurse Attributes	3. Age 4. Gender 5. Race/Ethnicity 6. Role 7. Work Status 8. Primary Unit 9. Years on Primary Unit 10. Highest Level of Nursing Education 11. Certification 12. Magnet Facility	Demographics (Participant Characteristics)	On-line survey
Nurse Practice Environment	13. Nurse Participation in Hospital Affairs 14. Nursing Foundations for Quality of Care 15. Nurse Manager Ability, Leadership, and Support of Nurses 16. Staffing and Resource Adequacy 17. Collegial Nurse-Physician Relations 18. Composite	Practice Environment Scale of the Nursing Work Index (PES-NWI) Subscales	On-line survey

Sample and Setting

The research setting took place in a large urban stand-alone, pediatric teaching hospital located in Southern California. The sampling plan included purposive, non-randomized sampling of eligible nurses who spent at least 50% of their time in direct patient care in any of the selected five types of inpatient units. An on-line self-administered nurse survey was sent to an estimated 400 nurses during August/May 2014.

Inclusion criteria consisted of direct-care nurses that were full-time, part-time, per diem, or travelers; have been employed a minimum of six months on their current unit by

the time the survey was administered; and worked on any of the following five types of inpatient units: Critical Care Unit (PICU), Neonatal Intensive Care (NICU) Inpatient Units (NICU Unit, NICU East, NICU West), Medical Inpatient Units (2 Rose, 4 East and Medical Behavioral Unit (MBU)), 3 East Surgical Unit, or Hematology/Oncology (Hem/Onc) Inpatient Unit (see Appendix A). Working a minimum of six months on their primary unit was important to allow the respondent enough time to engage in their environment in order to provide meaningful perspective.

Access to the sample population of eligible nurses was obtained from the Leadership team of each of the five types of inpatient units. Information regarding start date on current unit and verification of at least 50% of their time in direct-patient care to qualify nurses for the survey was sought from unit Leadership. Access to work email addresses was also requested by the researcher for ease of submitting the electronic survey. A consent form was included in the introductory email, which accompanied the survey (see Appendix B). Responses were accessed directly by the researcher via secure log on and password on the on-line survey site.

The survey was administered during a 3-week period in April/May 2014 to permit participants a reasonable timeframe in which to complete the survey. Reminder emails were sent to all eligible nurses weekly beginning the second week of survey administration. As recognition for their time spent completing the survey, participants had the option to submit their email address at the end of the survey to participate in an opportunity drawing to win a $50 gift card, in which six winners was selected. Those names were kept on a flash drive in a locked drawer of which the research team only had

access to. Once the winners were determined, all names were erased from the flash drive to maintain anonymity.

Since the sample was a purposive, non-randomized sample of nurses working in selected units for a single pediatric teaching hospital on the Magnet journey, the study's ability to be generalized to other populations was limited.

Power, Effect, and Sample Size

There is no consensus on the approach to compute power and sample size with logistic regression; although as pointed out by Katz (2011), 10 outcomes for each independent variable are appropriate. In logistic regression, an estimate of the probability of a certain event occurring is made, rather than detecting the difference or relationship that may be present, such as in linear regression. No assumptions were made about the dependent variable (DV) and independent variable (IV), the relationship is non-linear, and is not normally distributed (Munro, 2005). Some researchers use the likelihood ratio test; some use the test on proportions; some suggest various approximations to handle the multivariate case. Some advocate the use of the Wald test since the Z-score is routinely used for statistical significance testing of regression coefficients (Demidenko, 2007).

Since this a descriptive study and not focused on hypothesis testing, the Logistic Regression Model, which includes statistical significance defined by $p < 0.05$, where p is from the Wald test for Confidence Interval for the Odds ratio and overall statistical significance is tested by the likelihood ratio test, $p < 0.1$, was used to demonstrate logistic regression model fit. Unlike bivariate or multiple regression, one of the strengths of using a Logistic Regression approach are that a researcher can discuss the predictive power of the concept of the odds ratio (OR) for each independent variable (Huck, 2008).

This means that a researcher can predict the probability of Y variable occurring given X variable. Furthermore, this is the method to be used when the dependent variable – in this study, PIV infiltrations – is a binary (categorical) variable.

Sample size was determined via a web-based sample size calculator. With a 5% margin of error, 95% confidence level, estimated population size of 400, and a 50% response distribution, a sample size of 197 nurses was needed (www.raosoft.com, 2014). A total of 168 surveys were completed, which was close to the power desired.

Data Collection

The total number of PIV infiltrations per unit within a 6-month period leading up to survey administration was studied. The 6-month period corresponded with the minimum length of time an eligible nurse must be employed on their primary unit. PIV infiltration rates were collected one of two ways - 1) computer-generated report outlining the number of patients who had a PIV removed from October 2013 to April 2014. From this report, the research team was able to determine whether or not the reason for removal of a PIV was due to infiltration or extravasation from a pre-generated pick list, and was dummy-coded as 0 = PIV removed due to other reasons and 1 = PIV removed due to infiltration or extravasation; and also by 2) self-reported PIV infiltrations asked as a single question asked at the end of the survey.

The Practice Environment Scale of the Nursing Work Index (PES-NWI) was derived from the Nursing Work Index (NWI) survey, which was developed in 1989 shortly after the original study of Magnet hospitals. The NWI consisted of 65 items comprised of the organizational attributes of the work environment. The PES-NWI scale development and evaluation went through several stages before the end result of a 31-

item survey with five subscales were established (see Appendix C). A 4-point Likert scale was used ranging from *Strongly Agree* – 4, *Agree* – 3, *Disagree* – 2, *Strongly Disagree* – 1 indicating whether the element was "present in your current job". Although this survey can be found in the public domain, special permission was sought from the researcher and granted by the author to use for this research study.

The survey was formatted into an electronic survey design to allow for on-line submission, completion, and data collection. The electronic survey enabled access to potential participants via work email, allowing for a more accurate delivery versus traditional mail service. The PES-NWI was selected because it provided areas of interest related to work environment in the five subscales and is used by many hospitals on the Magnet journey.

The five subscales were 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 Relations (3 items).

The development of the PES-NWI scale revealed high internal reliability in all five subscales: Nurse Participation in Hospital Affairs, α=.83; Nursing Foundations for Quality of Care, α=.80; Nurse Manager Ability, Leadership, and Support of Nurses, α=.84; and Staffing and Resource Adequacy, α=.80; and Collegial Nurse-Physician Relations, α=.71; as well as content validity, demonstrated at both the individual and hospital levels (Lake, 2002).

To test reliability, the researcher performed a Cronbach's Alpha statistical test

prior to data analysis. The scale was consistent in exhibiting high internal reliability with this study sample in all subscales: Nurse Participation in Hospital Affairs, α=.84; Nursing Foundations for Quality of Care, α=.80; Nurse Manager Ability, Leadership, and Support of Nurses, α=.88; Staffing and Resource Adequacy, α=.84; and Collegial Nurse-Physician Relations, α=.91.

Data Management and Analysis

The data was then analyzed using IBM SPSS version 22. Descriptive and inferential statistics were used to answer the following research questions:

Research Question 1:

Is there a statistically significant difference in the proportion of PIV infiltrations by nursing unit?

Research Question 2:

Is there a statistically significant difference in PES-NWI subscale score by nursing unit?

Research Question 3:

Is there a statistically significant difference in PES-NWI score by PIV infiltration status?

Research Question 4:

Are nurse attributes and the nurse practice environment related to PIV infiltrations?

Prior to beginning of the data analysis, it was important to screen the raw data to become familiar with the data and check for inaccuracies. This pre-analysis screening

involved validating the data was entered correctly, and checking for missing data and outliers to identify and make corrections to potential problems that may inaccurately influence data analysis.

Data responses were initially reviewed to ensure all data was transcribed accurately and reflected the appropriate number of participants for all survey questions. Missing data were left blank as IBM SPSS automatically codes these blank data fields as 'missing'. Re-checking the data to ensure recoding was performed accurately validated this. Additionally, from the PES-NWI survey responses, only one outlier was discovered for the variable "years in primary unit" where the respondent answered "210" years. This was changed to 'missing data' because when cross-referenced to the respondent's answer of "age", it was determined that it was highly unlikely that "years on primary unit" would surpass "age". It was also noted that responses to the single question of PIV infiltrations were submitted as numerical or text. Responses that reflected missing data via text were then re-coded as 'missing data' to convert into a numerical variable format for appropriate data analysis. Consequently, responses that were submitted via text as 'None' were re-coded as the numerical value of 0.

Therefore, after close examination of the data, it was determined general survey responses with missing data would be excluded from data analysis. This decision was made because there was not a good way to estimate missing data that added value and accuracy to data analysis. With all of these factors accounted for when running the appropriate statistical analyses, the final sample size was 122.

Protection of Human Subjects

Institutional Review Board (IRB) approval was obtained from both the University of San Diego (USD) and the facility where the research was conducted. Participation in the research study was voluntary and the participant had the option to withdraw from the study at any given time. Furthermore, discontinuation of or non-participation had no bearing on the participant's employment status or annual evaluation. This was outlined in detail in the consent form attached to the on-line survey.

There were potential risks and benefits to those who participated in this study. The potential risks in the study were confidentiality of information and anonymity of the participants. To provide protection of the participants from these risks, responses were coded whereas only the research team had access to identification, and then later de-identified, maintaining confidentiality and anonymity of the information. The coded documents were stored on a flash drive in a locked drawer, which only the research team had access to.

Chapter 4

Results

The purpose of this research this study was to describe the relationship of the nurse practice environment and peripheral intravenous (PIV) infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey. The IBM SPSS version 22 program was used for data analysis. Descriptive statistics and inferential statistics were the statistical procedures utilized for data analysis.

Descriptive statistics were used to examine the data in a meaningful way and helped the researcher describe the data utilizing measures of central tendency (Munro, 2005). Measures of central tendency provide a way to summarize the data into more understandable terms and can often be described using mean, median and mode. Inferential statistics are methods that allow researchers to make generalizations about populations based on the sample being studied (Huck, 2008). The specific statistical methods performed and research findings are presented in this chapter.

AIM 1. Characterize nurses' attributes, nurse practice environment, and PIV infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.

The study measures were organized into 3 dimensions: PIV infiltrations, Nurse Attributes, and Nurse Practice Environment as outlined in Tables 1 and 2. One hundred sixty-eight nurses responded to the survey, upon completion of data cleaning and diagnostic procedures, cases with missing data or outliers were excluded leaving a sample of 122 nurses.

Nurse Attributes

The majority of respondents were female (n = 141, 96.6%) White/Non-Hispanic (n = 116 , 77.9%), and worked as a full-time core staff nurse (n = 137, 93.2%), The sample's mean age was 35.8 (sd = 8.4) and worked on their primary unit an average of 8.77 (sd = 17.9) years. The highest level of nursing education was an undergraduate nursing degree (n = 128) – Diploma (1.3%); Associate (18.1%); and Baccalaureate (66.4%). Slightly more than 40% (n = 63) held a professional nursing certification and only 27% (n = 40), had previously worked at a Magnet facility. Respondents' were fairly evenly distributed across units as can be seen in Table 2.

Table 2. *Sample Description*

Dimension	Measures	%	Mean (*SD*)
Nurse Attributes	Age (M, SD)	--	35.86 (8.40)
	Gender		
	- Female	96.6%	--
	- Male	3.4%	--
	Race/Ethnicity		
	- Asian/Pacific Islander	9.4%	--
	- Hispanic/Latino(a)	7.4%	--
	- White/Non-Hispanic	77.9%	--
	- American Indian, Black/African American, Other/Mixed	7.9%	--
	Role		
	- Staff Nurse	93.2%	--
	- Advanced Practice Nurse, Nurse Educator, Nurse Leader, Other	6.8%	--
	Work Status		
	- Full-Time Core Staff	85.9%	--
	- Part-Time Core Staff, Per Diem, Traveler	14.1%	--
	Primary Unit		
	- 3 East Surgical Unit	24.5%	--
	- Critical Care Unit	20.3%	--
	- Hematology/Oncology (Hem/Onc) Unit	15.4%	--
	- Medical Inpatient Units	21.7%	--
	- Neonatal Intensive Care Inpatient (NICU) Units	18.2%	--
	Years as RN on Primary Unit	--	8.77 (17.911)
	Highest Level of Nursing Education		
	- Baccalaureate Degree, Associate Degree, Diploma	85.8%	--
	- Masters Degree, Doctorate Degree	14.1%	--
	Professional Nursing Certification		
	- Yes	42.9%	--
	- No	57.1%	--
	Previously Worked at Magnet Facility		
	- Yes	27%	--
	- No	73%	--

N = 122

PIV Infiltrations

Slightly less than half reported having experienced a PIV infiltration under their care during October 2013 to April 2014. 51.6% nurses did not. Refer to table 3 for the study measures.

Nurse Practice Environment

The Practice Environment Scale of the Nursing Work Index (PES-NWI) is a 31-item survey with five subscales representing distinct domains of the nurse practice environment (Lake, 2002). The five subscales are 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 Relations (3 items). A 4-point Likert scale was used ranging from *Strongly Agree* – 4, *Agree* – 3, *Disagree* – 2, *Strongly Disagree* – 1 indicating whether the element was "present in your current job".

Higher scores indicate the characteristics measured in each subscale are present in the respondent's environment. Specifically, scores below 2.5 signify general disagreement, and in contrast, scores above 2.5 signify general agreement. Lake & Friese (2006) explained the "subscale score is the average of the subscale item responses"; in the study reported here: Nurse Participation in Hospital Affairs = 2.75; Nursing Foundations for Quality of Care = 2.99; Nurse Manager Ability, Leadership, and Support of Nurses = 3.08; Staffing and Resource Adequacy = 2.96; and Collegial Nurse-Physician Relations = 2.86. These subscale scores indicate nurses are generally in agreement with the presence of the characteristics for each subscale item, with the most agreement in

Nurse Manager Ability, Leadership, and Support of Nurses subscale, and the least agreement in the subscale of Staffing and Resource Adequacy.

In this scoring, Lake & Friese (2006) also stated a "single composite score is calculated as the mean of the subscale scores." The composite score for the study sample population determined all five subscales have a mean = 2.86. This score indicates nurses are generally in agreement the characteristics in each subscale overall, are present in their current job. Refer to table 3 for the study measures.

Table 3. *Study Measures Description*

Dimension	Measures	%	Mean Score	Mean(*SD*)
PIV Infiltrations	PIV Infiltrations			
	- Infiltration	48.4%		--
	- No Infiltration	51.6%		--
Nurse Practice Environment	Nurse Participation in Hospital Affairs	--	2.75	.458
	Nursing Foundations for Quality of Care	--	2.99	.355
	Nurse Manager Ability, Leadership, and Support of Nurses	--	3.08	.511
	Staffing and Resource Adequacy	--	2.64	.561
	Collegial Nurse-Physician Relations	--	2.96	.569
	Composite	--	2.87	.371

AIM 2. Examine the relationships by potential predictors (nurses' attributes, nurse practice environment), and PIV infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.

Research Question 1: *Is there a statistically significant difference in the proportion of PIV infiltrations by nursing units?*

A Chi-Square test (χ^2) was performed as a comparison between what was observed and what would be expected by chance (Salkind, 2008). This test is appropriate

because both assumptions were met, there are two or more independent groups (nursing units) and both PIV infiltrations and nursing units are categorical data. As Table 4 presents, the proportion of PIVs with infiltrations and PIVS without infiltrations by nursing unit were observed. For nursing unit, the proportions of PIV infiltration status were further compared within each unit, as well as from one unit to another. Figure 2 also describes the Pearson Chi-Square Analysis explaining the differences between the observed and expected frequencies (Munro, 2005).

Table 4. *Chi-Square: Proportion of PIV Infiltrations by Nursing Unit*

	Infiltration Status	Comparison	3 East[1]	CCU[2]	Hem/Onc[3]	Medical[4]	NICU[5]	**Total**
PIV	No Infiltration	Count	1473	636	387	3362	572	6430
		% by unit	22.9%	9.9%	6%	52.3%	8.9%	100%
		% within unit	91.5%	83.5%	89.6%	92%	76%	89.2%
		% of Total	20.4%	8.8%	5.4%	46.6%	7.9%	89.2%
	Infiltration	Count	136	126	45	291	181	779
		% by unit	17.5%	16.2%	5.8%	37.4%	23.2%	100%
		% within unit	8.5%	16.5%	10.4%	8%	24%	10.8%
		% of Total	1.9%	1,7%	0.6%	4%	2.5%	10.8%
	Total	Count	1609	762	432	3653	753	7209
		% by unit	22.3%	10.6%	6%	50.7%	10.4%	100%
		% within unit	100%	100%	100%	100%	100%	100%
		% of Total	22.3%	10.6%	6%	50.7%	10.4%	100%

[1] 3 East Surgical Unit
[2] Critical Care Unit
[3] Hematology/Oncology Inpatient Unit
[4] Medical Inpatient Units
[5] Neonatal Intensive Care Inpatient Units

Figure 2. *Pearson Chi-Square Analysis*

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	202.607[1]	4	.000
Likelihood Ratio	171.756	4	.000
Linear-by-Linear Association	157.616	1	.000
N of Valid Cases	7209		

[1]. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 46.68.

The chi-square test indicates of 7,209 PIVs reported, 50.7% occurred in the Medical Inpatient Unit, 22.3% occurred in 3 East Surgical Unit, 10.6% occurred in Critical Care, 6% occurred in Hematology/Oncology, and 10.4% occurred in NICU Inpatient. Of the total number of PIVs reported, 6,430 were reported as no PIV infiltrations (89.2%) and 779 were reported as PIV infiltrations (10.8%).

The proportion of Medical Inpatient nurses who have experienced PIV infiltrations (37.4%) were of the highest proportion compared to the proportion of nurses who experienced PIV infiltrations in 3 East Surgical (17.5%), Critical Care (16.2%), Hematology/Oncology (5.8%), and NICU Inpatient (23.2%) units. Conversely, the test also revealed that the proportion of Medical Inpatient nurses who did not experience PIV infiltrations (52.3%) remain of the highest proportion compared to the proportion of nurses who did not experience PIV infiltrations in 3 East (22.9%), Critical Care (9.9%), Hematology/Oncology (6%), and NICU Inpatient (8.9%) units.

The test indicates PIV infiltrations were less likely to occur across all units – Medical Inpatient (8%), 3 East (8.5%), Critical Care (16.5%), Hematology/Oncology

(10.4%), and NICU Inpatient (24.8%) than no PIV infiltrations within those same units – Medical Inpatient (92%), 3 East (91.5%), Critical Care (83.5%), Hematology/Oncology (89.6%), and NICU Inpatient (76%). There is a statistically significant difference in the proportion of PIV infiltrations by nursing units, $\chi^2(4) = 202.61$, $p < .05$.

Research Question 2: *Is there a statistically significant difference in PES-NWI subscale score by nursing unit?*

A non-parametric test was performed because the assumptions of parametric tests could not be met. In parametric tests, means are compared and therefore, the One-way ANOVA would be the likely test to perform for continuous data that are normally distributed. However, the composite PES-NWI score (DV) was not normally distributed by nursing unit (IV). Thus, in this situation, we would like to have a better measure of central tendency. As the data becomes skewed the mean loses its ability to provide the best central location for the data because the skewed data is pulling it away from the typical value. However, the median best retains this position and is not as strongly influenced by the skewed values (Huck, 2008). Therefore, a Kruskal-Wallis Test was performed to compare medians across 3 or more groups and is presented in Figure 3 and Table 5. Figure 3 shows the overall results for each subscale by nursing unit. Table 5 revealed the statistically significant pairwise comparisons for impacted PES-NWI subscales.

Figure 3. *Kruskal-Wallis Test Output: PES-NWI Subscale Score by Nursing Unit*

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Subscale1 is the same across categories of Primary Unit.	Independent-Samples Kruskal-Wallis Test	.006	
2	The distribution of Subscale2 is the same across categories of Primary Unit.	Independent-Samples Kruskal-Wallis Test	.005	
3	The distribution of Subscale3 is the same across categories of Primary Unit.	Independent-Samples Kruskal-Wallis Test	.000	
4	The distribution of Subscale4 is the same across categories of Primary Unit.	Independent-Samples Kruskal-Wallis Test	.838	Retain the null hypothesis.
5	The distribution of Subscale5 is the same across categories of Primary Unit.	Independent-Samples Kruskal-Wallis Test	.000	

Asymptotic significances are displayed. The significance level is .05.

Table 5. *Statistically Significant Pairwise Comparisons of PES-NWI Subscales by Unit*

Subscale	Sample1-Sample2	Median	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
(1) Nursing Participation in Hospital Affairs	3 East Surgical Unit-Hematology/ Oncology (Hem/Onc) Inpatient Unit	2.556 2.944	-32.101	11.226	-2.860	.004	.042
(2) Nursing Foundations for Quality of Care	Neonatal Intensive Care Inpatient (NICU) Units-Hematology/ Oncology (Hem/Onc) Inpatient Unit	2.800 3.200	40.628	11.933	3.405	.001	.007
(3) Nurse Manager Ability, Leadership, and Support of Nurses	Neonatal Intensive Care (NICU) Inpatient Units-3 East Surgical	3.000 3.400	41.117	10.384	3.960	.000	.001
	Medical Inpatient Units-3 East Surgical	3.000 3.400	37.458	9.892	3.787	.000	.002

5) Collegial Nurse-Physician Relations	3 East Surgical Unit-Critical Care Unit	2.667 3.000	-43.861	9.630	-4.555	.000	.000
	Hematology/ Oncology (Hem/Onc) Inpatient Unit-Critical Care Unit	3.000 3.000	33.149	10.842	3.057	.002	.022

The Kruskal-Wallis Test indicates the median PES-NWI subscale score was significantly different in one or more of the nursing units.

The median PES-NWI score for Subscale 1 - Nursing Participation in Hospital Affairs is lower in 3 East Surgical (median = 2.556) than Hem/Onc (median = 2.944), $p < .05$.

The median PES-NWI score for Subscale 2 - Nursing Foundations for Quality of Care is lower in NICU (median = 2.800) than Hem/Onc (median = 3.200) , $p < .05$.

The median PES-NWI score for Subscale 3 - Nurse Manager Ability, Leadership, and Support of Nurses is lower in NICU (median = 3.000) than 3 East Surgical (median = 3.400). For this same subscale, the median PES-NWI score is lower in Medical (median = 3.000) than 3 East Surgical (median = 3.400), $p < .05$.

The median PES-NWI score for Subscale 5 – Collegial Nurse-Physician Relations is lower in 3 East Surgical (median = 2.667) than Critical Care (median = 3.00). For this same subscale, the median PES-NWI score is the same in Hem/Onc (median = 3.000) as in Critical Care (median = 3.000), $p < .05$.

There is no statistical significance in the median PES-NWI score for Subscale 4 in one or more of the units, $p = .838$.

Research Question 3: *Is there a statistically significant difference in PES-NWI score by PIV infiltration status?*

Similar to research question #2, a non-parametric test was performed because the assumptions of parametric tests could not be met. The parametric test, Independent Two Sample-T-Test, would be the likely method to perform to examine if a mean is significantly different by 2 groups, and if the normality assumption is satisfied. The composite PES-NWI score (DV) was not normally distributed by PIV infiltration status (IV).

Therefore, a Mann-Whitney U Test (also known as the Wilcoxon Test) was performed to compare medians of two independent samples and is presented in Figure 4 and Table 6 (Huck, 2008)

Figure 4. *Mann-Whitney U Test: PES-NWI Score by PIV Infiltration Status*

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The medians of PES are the same across categories of PIVDich.	Independent-Samples Median Test	.860	Retain the null hypothesis.
2	The distribution of PES is the same across categories of PIVDich.	Independent-Samples Mann-Whitney U Test	.975	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Table 6. *Mann-Whitney U Test: PES-NWI Score by PIV Infiltration Status*

PIV Infiltration Status	N	Minimum	Maximum	Mean	Median	Mode	*SD*	*Variance*
Infiltration	62	2.01	3.92	2.88	2.87	2.89	.389	.151
No Infiltration	66	3.92	3.85	2.86	2.88	2.63[a]	.339	.115

a. Multiple modes exist. The smallest value is shown.

The Mann-Whitney U Test indicates the median of PES-NWI score was not significantly different for PIVs with infiltration or without infiltration (median = 2.87), p = .860 at $\alpha = .05$, or significantly different for PIVs that were infiltrated (median score = 2.87) and those that were not infiltrated (median score = 2.88), p = .975, at $\alpha = .05$.

AIM 3. Examine factors that increase the odds of PIV infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.

Research Question 4: *Are nurse attributes and the nurse practice environment related to PIV infiltrations?*

Logistic Regression was the most appropriate statistical method because it predicts and explains data where the dependent variable is dichotomous (categorical) and has one or more independent variables that are continuous or categorical. Also in a Logistic Regression model, the effect of an independent variable on the dependent variable is described as an odds ratio (OR). The odds ratio (OR) describes how likely an event is to occur; it is a measure of association.

A Multivariate Logistic Regression was performed to identify the predictors of PIV infiltrations. This statistical procedure provides the best fit to describe the relationship between the binary dependent variable and a set of multiple independent variables for this research study, therefore, this method was the most appropriate analytic method (Munro, 2005). Additionally, a Logistic Regression requires a large sample size and according to Field (2005), there should be at least 10 cases per independent variable.

The variables included in the model were nurse attributes - Age, Work Status, Primary Unit, Years as an RN on Primary Unit, Highest Level of Nursing Education,

Professional Nursing Certification, and Previously Worked at Magnet Facility. Gender, Race/Ethnicity and Role were not considered as exposures of interest because there was not enough variability among responses. Therefore, in the Final Multivariate Regression Model, only the independent variables with $p < .15$ were included, which also adjusted for Age.

Each independent ordinal and categorical variable was entered as recommended by Mertler and Vannatta (2005). Collinearity statistics revealed VIF values are < 4 and tolerance values are > 0.2. Therefore, there are no concerns about collinearity. Regression results indicate the overall model of Age, Primary Unit, Years as an RN on Primary Unit, and Previously Worked at Magnet Facility predictors were statistically reliable in distinguishing of status of PIV (–2 Log Likelihood = 144.580; $\chi 2$ (7) = 24.55, $p = .001$). The model correctly classified 69.7% of the cases. Regression coefficients are presented in Table 7. Wald statistics indicate Age and Years as an RN on Primary Unit predictor variables were significantly related to the likelihood of experiencing PIV infiltrations.

Table 7. *Regression Coefficients*

Predictor	B	S.E.	Wald	Df	Odds Ratio	95% Confidence Interval		*SD*
						Lower	Upper	
Age	.065	.037	3.039	1	1.067	.992	1.147	.081
*Unit			13.320	4				.010
Critical Care	-.978	.613	2.544	1	.376	.113	1.251	.111
Hem/Onc	-2.302	.709	10.532	1	.100	.025	.402	.001
Medical	-.968	.576	2.818	1	.380	.123	1.176	.380
NICU	-1.754	.646	7.372	1	.173	.049	.614	.007
Years as an RN on Primary Unit	-.107	.051	4.475	1	.898	.814	.992	.034
Previously Worked at Magnet Facility	.573	.484	1.403	1	1.774	.687	4.577	.236

* 3 East Surgical was used as the reference unit

Nursing unit was significantly associated with PIV infiltrations, $p < .05$.

Nurses who work on the Critical Care Unit are less likely to experience PIV infiltrations than nurses on 3 East Surgical, (OR = 0.376, 95% confidence interval [0.113-1.251]; p = .111).

Nurses who work on the Medical Units are less likely to experience PIV infiltrations than nurses on 3 East Surgical, (OR = 0.380; 95% confidence interval [0.123-1.176]; p = .093).

Nurses who work on the NICU Unit are less likely to experience PIV infiltrations than nurses on 3 East Surgical, (OR = 0.173; 95% confidence interval [0.049-0.614]; p = .007).

Nurses who work on the Hem/Onc Unit are the least likely to experience PIV infiltrations than nurses on 3 East Surgical, (OR) = 0.100; 95% confidence [0.025-0.402];

p = .001).

Years as an RN on Primary Unit were also significantly associated with PIV infiltrations. For every 1-unit increase in years of nursing experience, the odds of PIV decreased 10% (OR = 0.898; 95% confidence interval [.814-.992]; p = .034).

There was no statistical significance associated with Age (OR = 1.67; 95% confidence interval [0.992-1.47]; p = .081); or having previously worked in a Magnet facility (OR = 1.78; 95% confidence interval [0.687-4.577]; p = .236).

Chapter 5

Discussion

Nursing continues to face many challenges surrounding global issues in healthcare such as healthcare reform, the current nursing shortage, and the need for immediate health information exchange by consumers, to name a few. Magnet designation is also a key aspect of nursing, which places pressure on healthcare organizations to commit to nursing excellence and patient care should they take the challenge of attaining this prestige. Additionally, with growing focus on quality and safety, nursing needs to remain diligent in ensuring a healthy work environment that not only supports the profession, but also sustains exceptional patient outcomes.

To address nursing's role in the continuum of modern healthcare, this research study addressed the following objectives:

AIM 1. Characterize nurses' attributes, nurse practice environment, and PIV infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.

AIM 2. Examine the relationships between potential predictors (nurses' attributes, nurse practice environment), and PIV

infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.

AIM 3. Examine factors that increase the odds of PIV infiltrations in a large urban stand-alone, pediatric teaching hospital on the Magnet journey.

The research findings from this study indicated there were several statistically significant relationships with PIV infiltrations, Nurse Attributes, and the Nurse Practice Environment. These findings can help us better understand the associations amongst these variables and provide a framework for nursing and their professional impact and responsibilities in addressing current and future healthcare demands. Aim 1 described the overall study measures and is evaluated against the 2008 National Sample of Registered Nurses by the Health Resources and Services Administration (HRSA) (U.S Department of Health and Human Services [DHHS], 2010). Table 8 demonstrates that the study findings remain relatively consistent in comparison to the national database. To note, the following study measures were omitted due to their specificity of the sample population and study site in meeting the research aims and questions: PIV infiltrations, Primary Unit, Years as RN on Primary Unit, Magnet Facility and PES-NWI scores.

Table 8. *Nurse Attributes Comparison to National Sample Survey of Registered Nurses*

Characteristics	2014 Research Survey of Nurses	*2008 National Sample of Registered Nurses (DHHS)
Age	35.86	47.0
Gender		
- Female	96.6%	93.4%
- Male	3.4%	6.6%
Race/Ethnicity		
- Asian/Pacific Islander	9.4%	5.8%
- Hispanic/Latino(a)	7.4%	3.6%
- White/Non-Hispanic	77.9%	83.2%
- American Indian, Black/African American, Other/Mixed	7.9%	7.4%
Role	93.2%	61.4%
- Staff Nurse	6.8%	18.6
- Advanced Practice Nurse, Nurse Educator, Nurse Leader, Other		
Work Status	85.9%	25.8%
- Full-Time Core Staff	14.1%	74.2%
- Part-Time Core Staff, Per Diem, Traveler		
Highest Level of Nursing Education	85.9%	85.3%
- Baccalaureate Degree, Associate Degree, Diploma	14.1%	10.2%
- Masters Degree, Doctorate Degree	42.9%	35.7%
Professional Nursing Certification	57.1%	--
- Yes		
- No		

*Estimated numbers may not equal totals, percentages may not add to 100 because of rounding, and some data not being reported.

Aim 2 had several foci in addressing the proportion of PIV infiltrations by nursing unit, differences in the PES-NWI subscale score by nursing unit, and differences in the PES-NWI composite score by PIV infiltrations status. The study findings indicated that the unit on which the nurse worked does matter in relation to experiencing or not experiencing PIV infiltrations. Data showed that a nurse who works on the Medical Inpatient Units has a higher proportion of experiencing PIV infiltrations, as well as not experiencing PIV infiltrations. This is largely due to the highest count of reported PIVs

on the Medical Inpatient Unit compared to other units. Subsequently, the PES-NWI subscale score by nursing unit presented statistically significant differences in one or more of the nursing units in 4 of the 5 PES-NWI subscales. Overall, the PES-NWI composite mean score was 2.87, which indicated that nurses were generally satisfied with their work environment in their current job. Each subscale also reported mean scores within a range of 2.64-3.08. However, after statistical analysis, the construct of Staffing and Resource Adequacy (subscale 4) had no statistical significance in one or more of the units. What this indicates is that there is minimal variance in what nurses reported in the survey for this particular subscale. Additionally, the study also showcased that the PES-NWI composite median score revealed that it was not significantly different for PIVs with infiltration or without infiltration; meaning that the nurse perceptions of the work environment does not positively nor negatively impact the patient outcome of PIV infiltration status.

However, in Aim 3, there were variables of interest that indicated a statistically significant association with PIV infiltrations – Nursing Unit and Years as an RN on Primary Unit. As described earlier, this supports the inference that the unit on which the nurse works does matter in relation to experiencing or not experiencing PIV infiltrations. One might also infer that the more experienced a nurse is, the odds of PIV infiltrations decrease. This could be concluded that competency and clinical reasoning of an experienced nurse warrants credence to whether or not a patient will have a PIV infiltration in their care.

Nursing Implications

The study findings seem to indicate that the nurse work environment plays a role in the quality of care patients receive. This is indicative of Magnet-like behaviors that are prevalent in organizations that sustain and excel in improving quality indicators and excellence in nursing care. Although Magnet status is a nursing-centric model, it is a designation for the entire organization, which should speak of the magnitude of an extraordinary and supportive culture that is pervasive throughout. Moreover, nurses must first understand and embrace their pivotal role in achieving Magnet status. After all, the structures and processes that are set forth by the organization, and by nursing especially, will determine the results of patient outcomes.

Additionally, a healthcare organization must embrace its relationship with the nursing profession because nurses comprise the largest workforce in health care. Given the current nursing shortage, nurses leaving the profession are a growing concern. According to Bauerhaus, Staiger and Auerback (2009), the RN workforce will experience a dramatic reduction largely due to an aging workforce expected to retire in the next 2 decades. This ominous outlook puts patients at risk with possible decreased access to healthcare, or receipt of poor quality care. It is more important than ever for nursing researchers to engage in research related to the nurse work environment and its relationship to patient outcomes because "many RNs believe it [nursing shortage] is the root cause of both previous shortages and the current hospital RN shortage" (Bauerhaus, Staiger & Auerbach, 2009). Research indicates that nurses who feel empowered within their work environments and are recognized for their expertise and contributions are more likely to remain with an organization.

In order to sustain a caring culture for nurses, nursing requires a network of support from its organizational leaders and administration. "The purpose of leadership, essentially, is to help the organizational community attain its mutually defined goals, achieve sustainability, and advance its interests with regard to its own future" (Malloch & Porter-O'Grady, 2005, p. 179). By being aware of the current and future state of nursing in healthcare, Nurse Leaders and Hospital Administrators can plan a course of action that is responsive to the needs of nurses because of the influence nurses have on patient quality and safety. This highlights an important component of attaining Magnet designation and one that leaders should model and incorporate into their journey for excellence in nurse-centered and patient-centered outcomes.

However, organizational support and leadership by themselves cannot achieve top-quality outcomes. Professional nurses need to be able to articulate the impact nursing practice has on their work environment and patient outcomes. It is through nurses' professional role in maintaining the nursing process - the fundamental core of nursing practice - that will yield optimal results for nursing and patients alike. Correspondingly, a thorough comprehension of Magnet principles and a call to action in carrying out the model components will hopefully empower professional nurses to contribute to the body of nursing science through evidence-based practice and research.

Limitations

There were limitations to this study that deserve mention. This study is not a randomized, clinical trial. The sample was limited to nurses currently working on select inpatient units in a single, stand-alone pediatric teaching facility and therefore, is potentially biased. The nurses were also not representative of this single pediatric facility

because nurses based in ambulatory settings such as clinics and satellite inpatient units were not included. Their inclusion could potentially add a more robust evaluation of the conceptual model. Additionally, the nurses in this single, pediatric facility represented only a small portion of the nursing population in general, and may have different characteristics than the population of nurses globally. Essentially, generalization of the findings to the overall population is not appropriate.

Next steps in this area of research would be to replicate this study to include all nurses throughout the facility to provide a broader perspective of the variables being studied. Also, a longitudinal study would be more beneficial to notate trends throughout the Magnet journey – pre-designation, designation, and re-designation – to add a more meaningful perspective. Furthermore, a qualitative study of nurses on the units would provide additional insight of the perspectives of the work environment and its relationship to patient outcomes.

Conclusion

This study highlighted the importance of how the nurse practice environment and nursing-sensitive indicators contribute to pediatric patient-centered outcomes for hospitals on the Magnet journey. This study is a reflection of where nursing is and where it needs to go in the areas of nursing-centered and patient-centered outcomes research. By taking a closer look at how the nurse practice environment is associated with patient outcomes, hospitals on the Magnet journey can better align themselves with the tenets of the Magnet Recognition Program®, which are essential to a culture of excellence and innovation (American Nurses Credentialing Center [ANCC], 2014). Focusing on

measures that matter to consumers will enhance the success of healthcare organizations in supporting important quality initiatives for continuous improvement, and sustainability of nursing work culture and patient outcomes. Simply put, the quality of care one receives is an indication of an organization's commitment to its nursing workforce, and its diligence in ensuring that patient care goes uncompromised at any stage of the Magnet journey.

References

American Association of Critical-Care Nurses [AACN] (2005). AACN standards for establishing and sustaining healthy work environments. Retrieved from http://www.aacn.org/wd/hwe/docs/hwestandards.pdf

American Nurses Credentialing Center [ANCC] (2014). Magnet recognition program overview. Retrieved from http://www.nursecredentialing.org/Magnet/ProgramOverview..aspx

Agency for Healthcare Research & Quality [AHRQ] (2002). Fact sheet: AHRQ research relevant to understanding the impact of working conditions on patient safety, October 2002. Retrieved from http://www.ahrq.gov/research/findings/factsheets/errors-safety/workfact/working-conditions-and-patient-safety.pdf

Bauerhaus, P.I., Staiger, D.O, & Auerbach, D.I. (2009). *The future of the nursing workforce in the united states; Data, trends, and implications*. Sudbury, MA: Jones and Bartlett Publishers.

Brown, D.S., Aydin, C.F., & Donaldson, N. (2008). Quartile dashboards: translating large data sets into performance improvement priorities. *Journal for Healthcare Quality 30*(6), 18-30.

Centers for Disease Control [CDC] (2011). Guidelines for the prevention of intravascular catheter-related infections. *Morbidity and Mortality Weekly Report, 51*(RR10), 1-26. Retrieved from http://www.cdc.gov/hicpac/pdf/guidelines/bsi-guidelines-2011.pdf

Creswell, J.W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches.* (4th ed*)*. Thousand Oaks, CA: Sage Publications, Inc.

Demidenko E. (2007). Sample size determination for logistic regression revisited. *Statistics in Medicine, 26*(18), 3385-3397.

Field, A. (2005). Discovering statistics using spss. (2nd ed). Thousand Oaks, CA: Sage Publications, Inc.

Foster, L., Wallis, M., Paterson, B., & James, H. (2002). A descriptive study of peripheral intravenous catheters in patients admitted to a pediatric unit in one Australian hospital. *Journal of Infusion Nursing, 25*(3), 159-167.

Huck, S.W. (2008). *Reading statistics and research.* (5th ed). Boston, MA: Pearson Education Inc.

IBM SPSS (2013). SPSS Statistics (Version 22) [Software]. USA: IBM Corp.

Infusion Nurses Society (2011). Infusion Nursing Standards of Practice. *Journal of Infusion Nursing; Supplement to Jan/Feb 2011, 34*(1S), S66.

Institute of Medicine [IOM] (2003). Keeping patients safe: transforming the work environment of nurses. Retrieved September 22, 2010 from http://www.iom.edu/Reports/2003/Keeping-Patients-Safe-Transforming-the-Work-Environment-of-Nurses.aspx

Katz, M.H. (2011). *Multivariate analysis: A practical guide for clinicians and public health researchers.* (3rd ed). New York, NY: Cambridge University Press.

Lacey,S.R., Klaus,S.F., Smith,J.B., Cox, K., & Dunton, N.E. (2006). Developing measures of pediatric nursing quality. *Journal of Nursing Care Quality, 21*(3), 210-220.

Lake, E. T. (2002). Development of the practice environment scale of the nursing work index. *Research in Nursing & Health, 25*(3), 176-188.

Lake, E.T. & Friese, C.R. (2006). Variations in nursing practice environments: relation to staffing and hospital characteristics. *Nursing Research, 55*(1), 1-9.

Lundmark, V. (2008). Çhapter 46: magnet environments for professional nursing practice. *Patient safety and quality: an evidence-based handbook for nurses* (pp. 1-22). Rockville, MD: Agency for Healthcare Research and Quality.

Malloch, K., & Porter-O'Grady, T. (2005). *The quantum leader applications for the new world of work*. Sudbury, MA: Jones and Bartlett Publishers.

Mason, D. J., Leavitt, J. K., & Chaffee, M. W. (2002). *Policy & politics in nursing and health care* (4th ed.). St. Louis, MO: Saunders.

McClure, M. M., Poulin, M., Sovie, M., & Wandelt, M. (1983). *Magnet hospitals: attraction and retention of professional nurses.* American Academy of Nursing Task Force on Nursing Practice in Hospitals. Kansas City, MO: American Nurses Association.

Mertler, C.A. & Vannatta, R.A. (2005). *Advanced and multivariate statistical methods.* (3rd ed). Glendale, CA: Pyrczak Publishing.

Munro, B.H. (2005). *Statistical methods for health care research.* (5th ed). Philadelphia, PA: Lippincott Williams & Wilkins.

National Advisory Council on Nurse Education and Practice [NACNEP] (2008). Meeting the challenges of the new millennium. sixth annual report to the secretary of health and human services and the congress. Retrieved from

http://www.hrsa.gov/advisorycommittees/bhpradvisory/nacnep/Reports/sixthreport.pdf

Oishi, L.A. (2001). The necessity of routinely replacing peripheral intravenous catheters in hospitalized children. *Journal of Intravenous Nursing, 24*(3), 174-179.

Porter-O'Grady, T., & Malloch, K. (2007). *Quantum leadership a resource for health care innovation* (2nd ed). Sudbury, MA: Jones and Bartlett Publishers.

Raosoft, Inc. (2014). Sample size calculator. Retrieved March 20, 2014 from http://www.raosoft.com/samplesize.html

Shimandle, R.B., Johnson, D., Baker, M., Stotland, N., Karrison, T., & Arnow, P.M. (1999). Safety of peripheral intravenous catheters in children. *Infection Control and Hospital Epidemiology, 20*(11), 736-740.

Stone, P.W. & Gershon, R.M. (2009). Nurse work environments and occupational safety in intensive care units. *Journal of Nursing Administration, 39(7/8)*, S27-S34.

Stone, P.W., Larson, E.L., Mooney-Kane,C., Smolowitz, J., Lin, S. & Dick, A.W. (2009). Organizational climate and intensive care unit nurses' intention to leave. *Journal of Nursing Administration, 39(7/8)*, S37-S42.

The Joint Commission [TJC] (2014). About the joint commission. Retrieved from http://www.jointcommission.org/about_us/about_the_joint_commission_main.aspx

The Joint Commission [TJC] (2010). Robert wood Johnson foundation initiative on the future of nursing, at the institute of medicine, February 23, 2010. Retrieved from http://www.jointcommission.org/assets/1/18/RWJ_Future_of_Nursing.pdf

Ulrich, B.T., Buerhaus, P.I., Donelan, K., Norma, L. & Dittus, R. (2007). Magnet status and registered nurse views of the work environment and nursing as a career. *The Journal of Nursing Administration, 37*(5), 212-220.

Urden, L. (2006). *Transforming professional practice environments the magnet recognition program.* In Yoder-Wise,P.S. & Kowalski,K.E. (Eds.), *Beyond leading and managing nursing administration for the future* (pp.23-39). St. Louis, MO: Mosby Inc.

U.S. Department of Health and Human Service, Bureau of Health Professions (2010). The Registered Nurse population: Findings from the 2008 national sample survey of Registered Nurses. Retrieved from http://bhpr.hrsa.gov/healthworkforce/rnsurveys/rnsurveyfinal.pdf

Wood, M.J. & Ross-Kerr, J.C. (2011). *Basic steps in planning research: From question to proposal.* (7th ed). Sudbury, MA: Jones and Bartlett Publishers.

APPENDIX A

RESEARCH PARTICIPANTS WANTED

1) Are you a Full-Time, Part-Time, Per Diem, or Traveler *Registered Nurse?*
2) Do you spend at least 50% of your time in direct patient care?
3) Do you work on any of the following units?

- Pediatric Intensive Care Unit (PICU)
- Neonatal Intensive Care Unit (NICU) Inpatient Units
- Medical Inpatient Units
- 3 East Surgical Unit
- Hematology/Oncology (Hem/Onc) Inpatient Unit

4) Have you worked on your unit for at least the past 6 months?

If you answered "YES" to all of the questions, then we want to hear from YOU!

I am a Doctoral nursing student at the University of San Diego conducting a study to investigate the work environment of nurses and its impact on nursing practice. An invitation to participate in the PRACTICE ENVIRONMENT SCALE (PES) online survey will be sent to your work email soon, so please stay tuned. The survey will take about 30 minutes.

* All participants will have the option to enter their email address at the end of the survey for an opportunity drawing for a $50 gift card, in which six participants will be selected.

Questions? Need more information?
Contacts:
Jannise T. Baclig, PhD(c) RN
jbaclig@sandiego.edu or 619-855-1329
Dr. Linda Urden

urden@sandiego.edu or 619-260-7609

APPENDIX B

Recruitment Email with Informed Consent (electronic survey)

Subject: Request to Participate in a Nursing Research Study

"Perceptions of the Nurse Practice Environment Related to Peripheral Intravenous Infiltration Rates in a Pediatric Hospital on the Magnet Journey"

We would like to present an opportunity for you to participate in research about the work environment of nurses and nursing practice. By taking the time to complete the survey (enclosed within the link below), you will be contributing to the development of nursing research that will provide more insight and knowledge of nursing practice at RCHSD.

The study is being conducted by Jannise Baclig, PhD(c) RN, a doctoral student at the University of San Diego.

You are invited to participate in a research study investigating the work environment of nurses and its impact on nursing practice. You are being asked to participate in this study because you are currently employed as an RN working on any of the following five inpatient units: Critical Care Unit (CCU), Neonatal Intensive Care (NICU) Inpatient Units, Medical Inpatient Units, 3 East Surgical Unit, or Hematology/Oncology (Hem/Onc) Inpatient Unit.

Eligible RNs are full or part-time core staff, per diem staff, or travelers who spend at least 50% of their time in direct patient care, and have been employed a minimum of 6 months on their respective unit.

Participation is voluntary and requires only responding to a short on-line questionnaire. The survey will take about 30 minutes of your time. ***Your completion of this survey indicates that you have read the informed consent in the paragraph below, and that you agree to participate in this voluntary and confidential survey.*** Please retain a copy of this consent for your records.

The potential risks are no more than those encountered in everyday life. The risks of participating in this study are minimal and no more than those encountered in everyday life. Your responses will be kept confidential and all your information will be coded with a number. Your email or IP address will automatically be deleted, and nobody will know your identity. We will keep the study data for a minimum of 5 years.

Participation in this research study is strictly voluntary. Nothing about your employment of any other benefits will change if you decide not to complete the survey. You can quit anytime. ***At the end of the survey, all participants will have the option to enter their email address for an opportunity drawing for a $50 gift card, in which six participants***

will be selected. Your chances of winning will depend on how many nurses participate in the survey. It's possible that we may get 1200 participants, but we might get fewer. If you have any questions, you may contact Jannise Baclig – jbaclig@sandiego.edu or 619-855-1329 or Dr. Linda Urden – urden@sandiego.edu or 619-260-7609.

Please click the link below to enter the survey and participate in the study:

http://www.surveygizmo.com/s3/1198774/Practice-Environment-Scale-PES

APPENDIX C

Practice Environment Scale of the Nursing Work Index (PES-NWI)

Used with permission from Dr. Eileen T. Lake

For each item, please indicate the extent to which you agree that the item is *PRESENT IN YOUR CURRENT JOB.*
Response options: *strongly agree*=4, *agree*=3, *disagree*=2, *strongly disagree*=1.

Nurse Participation in Hospital Affairs

1. Career development/clinical ladder opportunity.
2. Opportunity for staff nurses to participate in policy decisions.
3. A chief nursing officer which is highly visible and accessible to staff.
4. A chief nursing officer equal in power and authority to other top-level hospital executives.
5. Opportunities for advancement.
6. Administration that listens and responds to employee concerns.
7. Staff nurses are involved in the internal governance of the hospital (e.g., practice and policy committees).
8. Staff nurses have the opportunity to serve on hospital and nursing committees.
9. Nursing administration consult with staff on daily problems and procedures.

Nursing Foundations for Quality of Care

1. Active staff development or continuing education programs for nurses.
2. High standards of nursing care are expected by the administration.
3. A clear philosophy of nursing that pervades the patient care environment.
4. Working with nurses who are clinically competent.
5. An active quality assurance program.
6. A preceptor program for newly hired RNs.
7. Nursing care is based on nursing, rather than a medical model.
8. Written, up-to-da nursing care plans for all patients.
9. Patient care assignments that foster continuity of care, i.e., the same nurse cares for the patient from one day to the next.
10. Use of nursing diagnoses.

Nurse Manager Ability, Leadership, and Support of Nurses

1. A supervisory staff that is supportive of the nurses.
2. Supervisors use mistakes as learning opportunities, not criticism.
3. A nurse manager who is a good manager and leader.
4. Praise and recognition for a job well done.
5. A nurse manager who backs up the nursing staff in decision-making, even if the conflict is with a physician.

Staffing and Resource Adequacy

1. Adequate support services allow me to spend time with my patients.
2. Enough time and opportunity to discuss patient care problems with other nurses.
3. Enough registered nurses to provide quality patient care.

4. Enough staff to get the work done.

Collegial Nurse-Physician Relations

1. Physicians and nurses have good working relationships.
2. A lot of team work between nurses and physicians.
3. Collaboration (joint practice) between nurses and physicians.

Demographics

Please tell us the following information about yourself:

1. What is your age?

   _____

2. What is your gender?
   a. _____ Male
   b. _____ Female

3. How would you describe your Race/Ethnicity (select all that apply)?
   a. _____ American Indian
   b. _____ Asian/Pacific Islander
   c. _____ Black/African American
   d. _____ Hispanic or Latina(o)
   e. _____ White/Non-Hispanic
   f. _____ Other

4. Which unit do you work on? If you work on more than one unit, please indicate your PRIMARY unit.
   a. _____ Critical Care Unit
   b. _____ Neonatal Intensive Care (NICU) Inpatient Unit(s)
   c. _____ Medical Inpatient Unit(s)
   d. _____ 3 East Surgical Unit
   e. _____ Hematology/Oncology (Hem/Onc) Inpatient Unit

5. What is your role on your PRIMARY unit?
   a. _____ Staff Nurse (including inpatient RNs, charge RN, resource RN, per diem, and travelers)
   b. _____ Advanced Practice Nurse (including Nurse Practitioner and Clinical Nurse Specialist)
   c. _____ Nurse Educator
   d. _____ Nurse Leader (including RN manager and RN supervisor)
   e. _____ Other Clinical Role

6. What is your work status on your PRIMARY unit?
   a. _____ Full-time Core Staff
   b. _____ Part-time Core Staff
   c. _____ Per Diem
   d. _____ Traveler

7. How many years have you been employed as an RN on your PRIMARY unit?

_____

8. What is your highest level of nursing education?
   a. _____ Diploma
   b. _____ Associate Degree
   c. _____ Baccalaureate Degree
   d. _____ Masters Degree
   e. _____ Doctorate Degree

9. Do you hold a professional nursing specialty certification (e.g., Certified Critical Care RN – CCRN)?
   a. _____ Yes
   b. _____ No

10. Have you ever worked in a Magnet Facility?
   a. _____ Yes
   b. _____ No

11. The research team would like to learn about nursing practice related to peripheral intravenous (PIV) infiltrations.

   On your PRIMARY unit, please provide the total number of PIV infiltrations, regardless of grade severity, that have occurred for patients under your care in the past 6 months (October 2013-March 2014).

   _____

12. If you would like to participate in the opportunity drawing, please enter your email address here: _____