

US ARMY PRIMARY CARE: NURSING PRACTICE ENVIRONMENT, TEAM
PERFORMANCE, AND OUTCOMES

by

MELISSA JEAN MILLER

A Dissertation submitted to the

Graduate School-Newark

Rutgers, The State University of New Jersey

In partial fulfillment of the requirements

for the degree of

Doctor of Philosophy

in Nursing Research

written under the direction of

Mary L. Johansen PhD, RN, NE-BC, FAAN

and approved by

Newark, New Jersey

October 2020

Copyright page:

© 2020

Melissa Jean Miller

ALL RIGHTS RESERVED

ABSTRACT OF THE DISSERTATION

US Army Primary Care: Nursing practice environment, team performance, and outcomes

By MELISSA JEAN MILLER

Dissertation Director:

Mary L. Johansen PhD, RN, NE-BC, FAAN

Rationale: In order to compete with the private sector in retaining highly competent and skilled nurses, it is critical to identify, through rigorous research methods, those system characteristics that contribute to or reduce attrition so that evidenced-based retention strategies can be designed and implemented in US Army primary care settings within the Military Health System.

Hypotheses: This study tested three hypotheses: (a) the nursing practice environment is positively associated with team performance, clinic staff perception of overall patient safety, and staff nurse job satisfaction, and negatively associated with staff nurse intent to leave, (b) team performance is positively associated with clinic staff perception of overall patient safety and staff nurse job satisfaction, and negatively associated with staff nurse intent to leave, and (c) team performance mediates the relationship between the nursing practice environment and clinic staff perception of overall patient safety, staff nurse job satisfaction, and staff nurse intent to leave.

Method: This is a cross-sectional, correlational study examining secondary data from 2016 representing 39 US Army primary care clinics located in eighteen states and Germany.

Purpose: The purpose of this study is to examine the relationships among the nursing practice environment, team performance, clinic staff perception of overall patient safety, staff nurse job satisfaction, and staff nurse intent to leave in US Army primary care clinics.

Findings: The findings of this study highlight the importance of a positive nursing practice environment, especially nurse manager ability, leadership, and support for nurses to clinic and staff nurse outcomes including intent to leave as an indicator of attrition.

Key words: nursing practice environment, team performance, patient safety, job satisfaction, intent to leave

Acknowledgements

I would like to acknowledge the tireless support of my family, committee, and friends throughout this degree program. Tyler, you provided me the perfect dose of rationalism and compassion. Daisy and Amy, mommy is so proud of you. Dr. Johansen, words cannot express my gratitude. Your passion, endurance, and will for me to succeed were my driving force. To my family and friends, thank you. This accomplishment would not have been possible without the opportunity to apply for the Army Medical Department Long Term Health Education and Training scholarship program, funding from the TriService Nursing Research Program, and a vast network of amazing researchers both within and outside of Rutgers University. A special thank you to LTC Swiger, and the Army Nursing Research team. You challenged me to grow, expected my best, and prepared me to soar.

Dedication

I dedicate this dissertation to COL (ret.) Patricia Patrician PhD, RN FAAN, COL (ret.) Bonnie Jennings PhD, RN FAAN, and COL (ret.) Sara Breckenridge-Sproat PhD, RN. Thank you for your service, your dedication, and your personal investment in my individual and professional development. You may not have known that a young lieutenant was listening to your presentations, reading your articles, and following your careers for guidance and direction, but you were instrumental in a special way to my decision to pursue a PhD and a career in nursing research.

Disclosure

This research project is sponsored by the TriService Nursing Research Program, Uniformed Services University of the Health Sciences; however, the information or content and conclusions do not necessarily represent the official position or policy of, nor should any official endorsement be inferred by, the TriService Nursing Research Program, Uniformed Services University of the Health Sciences, the Department of Defense, or the U.S. Government.

The views and information presented are those of the author and do not represent the official position of the U.S. Army Medical Department Center and School Health Readiness Center of Excellence, the U.S. Army Training and Doctrine Command, or the Departments of Army, Department of Defense, or U.S. Government

Table of Contents

Title Page	
Copyright Page	
Abstract	ii
Acknowledgement and Dedication	Error! Bookmark not defined.
Disclosure	iv
Table of Contents	v
List of Tables	Error! Bookmark not defined.
List of Illustrations	x
Chapter One	1
The Problem	1
Phenomenon of Interest	2
Nurse Outcomes	3
Process of Care	4
Organizational Outcome: Overall Patient Safety	5
Significance of the Study	7
Study Purpose	7
Research Questions	8
Chapter Two	10
Literature Search Strategy	10
Literature Review	11
Knowledge Gaps	18
Conceptual Model	19

Hypotheses _____	28
Chapter Three _____	30
Description of Research Setting _____	30
Sample _____	31
Instruments _____	37
Procedure for Data Collection _____	43
Operational Definitions _____	46
Chapter Four _____	50
Sample Description _____	50
Statistical Description of Variables _____	52
Psychometric Properties of Instruments _____	61
Results of Hypothesis Testing _____	62
Chapter Five _____	78
Discussion _____	78
Usefulness of the Conceptual Model _____	88
Conclusion _____	89
Chapter Six _____	90
Summary _____	90
Limitations _____	94
Recommendations _____	95
Conclusions _____	96
Implications _____	97
Bibliography _____	99

Appendices	111
Evidence Table	111
Instruments	188
Mediation Analysis	194

List of Tables

- Table 1. Dimensions of Overall Perception of Patient Safety with Definitions
- Table 2. Army Nurse Corps Primary Care Clinic Sample Descriptives by Military Treatment Facility
- Table 3. Army Primary Care Clinic Sample Descriptives
- Table 4. Empirical Indicator Original Sample, Validity Testing, and Reliability Coefficients
- Table 5. PES-NWI Skewness and Kurtosis Diagnostics
- Table 6. T-TPQ Skewness and Kurtosis Diagnostics
- Table 7. Military Health System Patient Safety Culture Survey Skewness and Kurtosis Diagnostics
- Table 8. Study Variable Name, Type, and Empirical Indicators
- Table 9. Descriptive Statistics for the Dimensions of Clinic Staff Perception of Overall Patient Safety
- Table 10. Descriptive Statistics for Patient Safety Grade and Number of Events Reported
- Table 11. Descriptive Statistics for US Army Primary Care Staff Nurse Job Satisfaction
- Table 12. Descriptive Statistics for US Army Primary Care Nurse Intent to Leave
- Table 13. Descriptive Statistics for the Dimensions of the Nursing Practice Environment
- Table 14. Descriptive Statistics for the Dimensions of Team Performance
- Table 15. Covariate Correlations with Dependent Variables
- Table 16. Alpha Coefficients for Study Instruments
- Table 17. Nursing Practice Environment Dimension Effects on the Dimensions of Team Performance

Table 18. Bivariate Relationships Between the Nursing Practice Environment and Staff Nurse Job Satisfaction

Table 19. Correlations Between the Nursing Practice Environment and the Dimensions of Clinic Staff Perception of Overall Patient Safety

Table 20. Effects of the Nursing Practice Environment on the Dimensions of Clinic Staff Perception of Overall Patient Safety

Table 21. Effects of the Dimensions of the Nursing Practice Environment on the Dimensions of Clinic Staff Perception of Overall Patient Safety

Table 22. Correlations Between the Dimensions of the Nursing Practice Environment and Staff Nurse Intent to Leave

Table 23. Correlations Between the Dimensions of Team Performance and the Dimensions of Clinic Staff Perception of Overall Patient Safety

Table 24. Simple Effect if the Dimensions of Team Performance on the Dimensions of Clinic Staff Perception of Overall Patient Safety

Table 25. Forward Inclusion Effects of the Dimensions of Team Performance on the Dimensions of Clinic Staff Perception of Overall Patient Safety.

List of Illustrations

Figure 1. Conceptual Model

Figure 2. Hypothesized Parallel Mediation Model

Figure 3. Total Effect and Mediation Model for Manager Expectations and Actions

Promoting Patient Safety

Figure 4. Total Effect and Mediation Model for Organizational Learning – Continuous

Improvement

Figure 5. Total Effect and Mediation Model for Communication Openness

Figure 6. Total Effect and Mediation Model for Frequency of Events Reported

Figure 7. Total Effect and Mediating Model for Staff Nurse Job Satisfaction

Chapter One

The Problem

Military nursing is not immune to nurse attrition. The primary mission of the Army Medical Department is to ensure service members are fit and medically ready to deploy and ensure the preparedness of the medical staff and system to provide care anywhere the service members may be (Defense Health Agency, 2017). The military term for this mission and purpose is “readiness”. Nurse attrition hinders the Army Medical Department by diminishing readiness (Army Medicine, 2019). Nurse attrition compromises the Army Medical Department ability to provide care to beneficiaries and ensure service members fit and medically ready to deploy. Nurse attrition has long been defined as the ongoing process of nurse turnover at various career stages which include involuntary, voluntary, internal, and external turnover (Crow & Hartman, 2005). The 2018 national rate of turnover for bedside registered nurses (RNs) is 16.7%, a 2% increase from 2016 (Nursing Solutions Inc., 2018). Licensed practical nurse turnover has been reported as high as 18% (Wisconsin Hospital Association, 2018). The estimated cost of RN turnover is \$38,000 to \$61,000 annually which totals \$4.4 - \$7 million annual loss for hospitals due to RN turnover alone (Nursing Solutions Inc., 2018). Nurse attrition is positively associated with nurse intent to leave, defined as leaving perceptions, which Lake (1998) found to be a significant predictor of actual nurse attrition (Cheng & Loui, 2011; Hayes et al., 2006).

In 2011, the Army Nurse Corps implemented a new framework for nursing called the Patient CaringTouch System. This evidence-based framework was developed to

improve patient outcomes, decrease variation in nursing practice, and reduce nurse turnover (Breckenridge-Sproat et al., 2015). Despite the implementation of the framework, pre and post-implementation evaluations of acute care settings indicate a significant increase in staff nurse job dissatisfaction and specifically, intent to leave over time (Breckenridge-Sproat et al., 2017). Reducing the attrition of nurses across the care continuum is a high priority for military nursing to include the Army Nurse Corps (TriService Nursing Research Program, 2018). Therefore, evaluation of the nursing practice environments of US Army primary care clinics in relationship with nurse outcomes to include staff nurse intent to leave are essential.

Phenomenon of Interest

Lake (2002) defines the nursing practice environment as the attributes or characteristics of an organization that either facilitate or impede the professional practice of nurses. It is important to distinguish the nursing practice environment from both the work environment and organizational climate. These terms have been utilized interchangeably across the literature. In the past decade, nurse researchers such as Lake (2007), have reaffirmed that the work environment is a broad concept which encompasses the nursing practice environment as well as the physical work environment and other healthcare organization structures. Organizational climate which amalgamates structures, processes, and outcomes has long been referred to as dated and neglected in the age of research examining organizational culture (Denison, 1996). The physical work environment and the organizational climate of healthcare organizations are not easily modified in contrast to attributes and characteristics of healthcare organizations, such as

the nursing practice environment, which possess greater modification potential (Aiken, Clarke, & Sloane, 2002).

Nurse Outcomes

An extensive prior body of research affirms a favorable, or supportive, nursing practice environment is positively associated with staff nurse outcomes to include job satisfaction, engagement, and well-being, and inversely associated with nurses' intent to leave their job (Aiken et al., 2002; Aiken & Patrician, 2000; Foley, Kee, Minick, Harvey, & Jennings, 2002). Research examining nursing practice environments in the past decade have primarily focused on inpatient or acute care settings in both the civilian and military healthcare sectors. Evidence from military samples indicate that unfavorable, or unsupportive, nursing practice environments in acute care settings are associated with negative nurse outcomes to include staff nurse job dissatisfaction, emotional exhaustion, intent to leave, nurse-reported fair to poor quality of care, and nurse-administered medication errors (Breckenridge-Sproat, Johantgen, & Patrician, 2012; Breckenridge-Sproat et al., 2017; Lake, 2002; Patrician et al., 2017; Patrician et al., 2010; Swiger et al., 2018).

Additionally, a few studies have examined the nursing practice environment in civilian sector, specialty ambulatory care settings to include home health, nursing homes, outpatient hemodialysis clinics, and outpatient oncology clinics (Choi, Flynn, & Aiken, 2012; Flynn, 2007; Flynn, Liang, Dickinson, & Aiken, 2010; Flynn, Thomas-Hawking, & Clarke, 2009; Friese & Himes-Ferris, 2013; Jarin, Flynn, Lake, & Aiken, 2014; Nelson-Brantley, Park, & Bergquist-Beringer, 2018b). These findings also indicate that favorable, or supportive, nursing practice environments in specialty ambulatory care

settings are associated with positive nurse outcomes including staff nurse job satisfaction, staff nurse intent to stay, nurse-assessed quality of care, and nurse-assessed patient safety (Choi et al., J. Choi et al., 2012; Flynn et al., 2010; Friese & Himes-Ferris, 2013; Thomas-Hawkins & Flynn, 2015). Inversely, research findings indicate that unfavorable, or unsupportive, nursing practice environments among specialty ambulatory care settings are associated with negative, or adverse nurse outcomes including staff nurse burnout, staff nurse exposure to chemotherapy, and staff nurse intent to leave (Flynn, 2007; Flynn et al., 2009; Friese, Himes-Ferris, Frasier, McCullagh, & Griggs, 2012). A recent meta-analysis examining eight unique observations found a strong, significant relationship between the nursing practice environment and nursing outcomes to include nurse intent to leave (OR = 0.72 [0.65, 0.80], $p < .01$), nurse job dissatisfaction (OR= 0.68 [0.62, 0.73], $p < .01$), and nurse burnout (OR= 0.74 [0.64, 0.85], $p < .01$) (Lake et al., 2019).

Process of Care

In addition to nurse outcomes, the nursing practice environment has been theorized to directly influence process of care (Aiken et al., 2002). The Agency for Healthcare Research and Quality (AHRQ) defines a process of care as those things that providers do to maintain, improve, or maintain and improve health (AHRQ, 2011). Research findings empirically support a direct, positive relationship between nursing practice environment and process of care (Flynn, 2007; Flynn, Liang, Dickson, Xie, & Suh, 2012; Friese et al., 2012). One study identified a direct relationship between process of care and staff nurse outcomes (OR= 8.75, [4.50, 17.01], $p < .001$) in a sample of registered nurses working in outpatient hemodialysis clinics (Flynn et al., 2009).

In Army medical treatment facilities, team performance is a process of care which has been defined as the current operational and functional state of a team within an organization (AHRQ, 2010). A team has been defined as a group of at least two or more individuals serving in specialized roles while adaptively, interdependently, and dynamically interacting to accomplish a common goal (Swezey et al., 1992). Therefore, the staff of a US Army primary care clinic are a team of specialized healthcare professionals with the common goal of providing safe patient care. Team performance includes team structure, leadership, situation monitoring, mutual support, and communication (AHRQ, 2010). The Big Five in Teamwork framework posits team performance as a stable concept ideal for comparison across staffs, facilities, and locales (Salas, Sims, & Burke, 2005). A key to earning Primary Care Medical Home (PCMH) certification is effective performance of the interdisciplinary team in coordinating patient-centered, comprehensive, safe, and quality care (The Joint Commission, 2018). An examination of team performance in Army primary care clinics is timely and relevant as these clinics are at various locales on the journey to PCMH certification.

Organizational Outcome: Staff Perception of Overall Patient Safety

Safe, quality care catapulted to the forefront of national healthcare priorities with the release of the 2000 Institute of Medicine report *To Err is Human*. A recent report mandated by the Secretary of Defense revealed renewed concerns regarding safe, quality care in the Military Health System to include the Army Medical Department. Findings from this review revealed generally safe healthcare practices, however, several areas demonstrated opportunities for improvement to include teamwork within units, staffing, and organizational learning (Defense Health Agency, 2014). Unfortunately, the Military

Health System lacked the ability to compare the results of this review to civilian or private sector healthcare systems (Defense Health Agency, 2014). The participation of the Military Health System in national healthcare quality and research databases would significantly improve the ability of the system to evaluate, compare, and further investigate evidence-based strategies for improvement. Safe, quality care is an organizational outcome incumbent on the safety culture of the organization. A direct, positive relationship between the nursing practice environment and organizational outcomes to include quality of care, occurrence of adverse patient events, and staff perception of safety has been empirically supported in the literature (Aiekn, Clarke, Sloane, Lake, & Cheney, 2009; Aiken & Poghosyan, 2009; Friese, Siefert, Thomas-Frost, Walker, & Ponte, 2016; Gasparino & Guirardello, 2017; Hinno, Partanen, & Vehviläinen-Julkunen, 2012; Kutney-Lee et al., 2015; Patrician et al., 2010; Panunto & Guirardello, 2013; Shang, Friese, Wu, & Aiken, 2013; Tervo-Heikkinen, Kiviniemi, Partanen, & Vehviläinen-Julkunen, 2009).

The Military Health System, now the Defense Health Agency, Patient Safety Program is guided by the AHRQ Patient Safety Culture Framework and initiatives. The AHRQ adopted the Advisory Committee on the Safety of Nuclear Installations' definition of a safety culture as the combination of individual and group values, attitudes, perceptions, competencies, and behavior patterns in determining organizations' safety commitment, style, and proficiency regarding the management of health and safety (Study Group on Human Factors, 1994). This committee suggested that a positive safety culture is comprised of the characteristics of open communication, mutual trust, shared perception of safety importance, and confidence in preventive measure efficacy. Safety

culture domains include communication openness, feedback and communication about error, frequency of events reported, handoff and transitions, management support for patient safety, nonpunitive response to error, organizational learning and continuous improvement, staffing, supervisor/manager expectations and actions promoting patient safety, teamwork across units, teamwork within units, patient safety grade, and number of events reported (AHRQ, 2016). Each of these domains incorporate safety-focused structures and processes.

Significance of the Study

Army primary care clinics are collectively responsible for the care of nearly four million beneficiaries to include active duty military service members, activated reservists, military family members, retirees, and military and retiree dependents. Army nurses constitute a significant proportion of the healthcare professionals providing care to this patient population. This study will inform the development and design of evidence-based retention strategies allowing military nursing to compete with the civilian sector in retaining highly competent and skilled nurses in primary care settings.

Study Purpose

The purpose of this study is to examine the relationships among the primary care nursing practice environment, team performance, staff perception of overall safety, and staff nurse job satisfaction with staff nurse intent to leave, as an indicator of potential attrition. Three specific aims include 1) describe staff nurse perception of the nursing practice environment in Army primary care clinics, 2) examine the associations among nursing practice environment, team performance, staff perception of overall safety, staff nurse job satisfaction, and staff nurse intent to leave, and 3) assess the mediating role of

team performance in the relationship between nursing practice environment and a) staff perception of overall safety, b) staff nurse job satisfaction, and c) staff nurse intent to leave.

There is a paucity of research examining the nursing practice environment of primary care settings, and importantly, in the unique setting of Army primary care. Military healthcare performs peacetime and wartime missions, often simultaneously. Nursing in Army primary care settings is turbulent due to the regular reassignment and relocation of both staff and beneficiaries. In addition to these regular rotations, staff and beneficiaries are also rotated in and out of clinics due to deployment in support of humanitarian and military operations, military training and education, and civilian training and education opportunities which may last a couple weeks to multiple months. These individuals often maintain a full-time equivalent position in their clinic which places an increased burden to redistribute the workload on clinic staffing. An exploration of the nursing practice environment and team performance in Army primary care clinics with nurse and organizational outcomes is essential to inform strategies for reducing staff nurse attrition and ensuring the provision of safe, quality care in these settings. This study will inform military nursing leaders regarding system characteristics that are associated with staff nurse attrition in Army primary care settings.

Research Questions

1. Within primary care clinics located in Army MTFs, is there a significant relationship between nursing practice environment and
 - a. team performance?
 - b. staff perception of overall safety?

- c. staff nurse job satisfaction?
 - d. staff nurse intent to leave?
- 2. Is there a significant relationship between team performance and
 - a. staff perception of overall safety among primary care clinics within Army MTFs?
 - b. staff nurse job satisfaction among primary care clinics within Army MTFs?
 - c. staff nurse intent to leave among primary care clinics within Army MTFs?
- 3. Does team performance mediate the relationship between nursing practice environment and
 - a. staff perception of overall safety among primary care clinics within Army MTFs?
 - b. staff nurse job satisfaction among primary care clinics within Army MTFs?
 - c. staff nurse intent to leave among primary care clinics within Army MTFs?

Chapter Two

Literature Search Strategy

To fully describe the concepts included in this dissertation, a literature search was performed utilizing the PubMed and CINAHL databases for the terms “nursing practice environment” or “nurse practice environment” with nurse outcomes to include intent to leave which yielded 334 articles. Abstracts were reviewed and studies were excluded which did not meet the criteria for inclusion which include empirical studies published in the last ten years and available in the English language. Empirical studies examining nursing students and nursing faculty were excluded as there are likely different circumstances responsible for the attrition of nursing students and faculty as compared nurses working in clinical settings. Advanced practice nurses were also excluded due to their adherence to a medical model rather than a nursing model in military settings. Empirical studies examining nurse midwives and nurse anesthetists were also excluded as these professionals provide specialized care following a medical, rather than nursing, model of care. A domain of the nursing practice environment evaluated by staff nurses is nurse manager leadership and support of nurses; therefore, nurse managers, articles focused on nurse executives, and other nurse administrator roles were excluded from this review. Two literature review articles detailing the history of an empirical measure of the nursing practice environment and two research program evaluations were also excluded. Three psychometric studies were retained which also examined the relationship of the nursing practice environment to nurse outcomes.

Literature Review

Thirty-three articles were retained for analysis and evaluation. Study sample, purpose, study design, conceptual framework, and significant findings for each study are detailed in an evidence table in Appendix A. From 2009 to present, the nursing practice environment has received significant coverage in the literature. Findings from the literature are synthesized and organized by relationship with the phenomenon of interest: nursing practice environment and 1) nurse outcomes, 2) process of care, and 3) organizational outcomes. The methodology employed by these studies is analyzed and evaluated below and knowledge gaps are identified.

Nurse Practice Environment and Nurse Outcomes

Burnout. Many studies examined nursing outcomes associated with nursing practice environments. Burnout was examined in sixteen of the studies (Aiken et al., 2009; Aiken & Poghosyan, 2009; Flynn et al., 2009; Fuentelsaz-Gallego, Moreno-Casbas, & González-María, 2013; Gasparino & Guirardello, 2017; Kutney-Lee et al., 2015; Liu et al., 2012; Nantsupawat et al., 2017; Patrician, 2010; Panunto & Guirardello, 2013; Alves, Silva, & Guirardello, 2017; Shang et al., 2013; Topçu et al., 2016; Van den Heede et al., 2013; Yurumezoglu & Kocaman, 2016; Zander, Blümel, & Busse, 2013) and operationalized most often as staff nurse responses on the Maslach Burnout Inventory (Maslach, Jackson, Leiter, Schaufeli, & Schwab, 2019). One study operationalized burnout as staff nurse responses on Wharton's seven item emotional exhaustion scale (Gabriel, Erickson, Moran, Diefendorff, & Bromley, 2013; Wharton, 1993). Similar terms examined in individual studies included job related feelings (Hinno et al., 2012), moral distress (Hiler, Hickman, Reimer, & Wilson, 2018), and job stress

(Tervo-Heikkinen et al., 2009). A consistent, significant finding in this literature is a strong correlation between nursing practice environment and nurse burnout (Flynn et al., 2009; Panunto & Guirardello, 2013; Zander et al., 2013). When controlling for the nursing practice environment, burnout was a significant predictor of nurse intent to leave among United States nephrology nurses (Flynn et al., 2009), German nurses (Zander et al., 2013), Belgian nurses (Van Bogaert et al., 2014), and Turkish nurses (Topçu et al., 2016).

Intent to leave. The literature demonstrates a tendency for individual researcher definition of intent to leave. Empirical indicators across the studies survey nurses concerning their contemplations of leaving their position, employer, institution, and the profession retrospectively over the past six months to one year (Hiler et al., 2018; Yurumezoglu & Kocaman, 2016), prospectively within the next six months to one year (Aiken et al., 2009; Aiken & Poghosyan, 2009; Blake, Leach, Robbins, Pike, & Needleman, 2013; Flynn et al., 2009; Friese et al., 2016; Fuentelsaz-Gallego et al., 2013; Gabriel et al., 2013; Kutney-Lee et al., 2015; Lee, Kim, Kang, Yoon, & Kim, 2014; Lin, Chiang, & Chen, 2011; Liu et al., 2012; Patrician et al., 2010; Panunto & Guirardello, 2013; Alves et al., 2017; Van Bogaert et al., 2014; Van den Heede et al., 2013), and ever contemplating to leave (Aiken & Poghosyan, 2009; Choi, Cheung, & Pang, 2013; Gasparino & Guirardello, 2017; Hinno et al., 2012; Lavoie-Tremblay, Paquet, Marchionni, & Drevniok, 2011; Shang et al., 2013; Zander et al., 2013). Cheng and Liou (2011) operationalize intent to leave as staff nurse responses on the Anticipated Turnover Scale by Hinshaw and Atwood (1987). Despite the differences in how intent to leave was defined and operationalized, the studies demonstrate similar findings. All but one study

(Shang et al., 2013), empirically support a significant relationship between the nursing practice environment and nurse intent to leave. Shang et al. (2013) delimited their sample for multivariate analysis to nurses reporting mixed and favorable nursing practice environments which resulted in a low percentage of nurses reporting intent to leave. A negative association between nurse intent to leave and job satisfaction is empirically supported across this literature.

Job satisfaction. Nineteen studies examine the relationship between nursing practice environment and nurse job satisfaction; most often operationalized as a single item measure asking nurses to rate how satisfied they are with their current job (Aiken et al., 2009; Choi et al., 2013; Friese et al., 2016; Fuentelsaz-Gallego et al., 2013; Hiler et al., 2018; Lee et al., 2014; Liu et al., 2012; Panunto & Guirardello, 2013; Roche et al., 2016; Tervo-Heikkinen et al., 2009; Van Bogaert et al., 2014; Yurumezoglu & Kocaman, 2016). Job satisfaction was also operationalized as researcher-developed multi-item questionnaires (Gabriel et al., 2013; Numminen et al., 2016; Alves et al., 2017), the Job Satisfaction Questionnaire (Goh & Lopez, 2016b), and the job satisfaction subscale of the Safety Attitudes Questionnaire (Gasparino & Guirardello, 2017). One study examined, more specifically, satisfaction with remuneration or nurse salary and payment (Zander et al., 2013). Nursing practice environment was a consistent predictor of nurse job satisfaction, and job satisfaction was inversely associated with nurse intent to leave across the literature. Four studies examined the contradictory concept, job dissatisfaction, which was associated with unfavorable nursing practice environments and a consistent predictor of nurse intent to leave (Kutney-Lee et al., 2015; Nantsupawat et al., 2017; Patrician et al., 2010; Shang et al., 2013).

Nurse Practice Environment and Organizational Outcomes

Quality of care and patient safety were commonly examined organizational outcomes often assessed by nurses (Aiken et al., 2009; Aiken & Poghosyan, 2009; Friese et al., 2016; Gasparino & Guirardello, 2017; Hinno et al., 2012; Kutney-Lee et al., 2015; Patrician et al., 2010; Panunto & Guirardello, 2013; Shang et al., 2013; Tervo-Heikkinen et al., 2009). Quality of care was examined by eight studies and operationalized as single-item, ranked measures (Aiken & Poghosyan, 2009; Friese et al., 2016; Patrician et al., 2010; Panunto & Guirardello, 2013; Shang et al., 2013; Tervo-Heikkinen et al., 2009) and multi-item, ranked measures (Aiken et al., 2009; Kutney-Lee et al., 2015). Hinno, Partanen, & Vevilainen-Julkunen (2012) operationalized quality of care as the improvement in care quality over one year. Each of these studies identified a positive relationship between nursing practice environment and quality of care.

Likewise, findings from each of the studies examining patient safety demonstrated a positive relationship between nursing practice environment and patient safety. Two studies examined nurse perceptions of the safety climate operationalized as nurse responses on the Safety Attitudes Questionnaire (Gasparino & Guirardello, 2017; Alves et al., 2017). Several studies examined adverse patient events to include patient and family complaints, patient falls, nosocomial infections, medication errors, thirty day surgical mortality, patient death within thirty days, and failure to rescue (Aiken et al., 2009; Kutney-Lee et al., 2015; Van Bogaert et al., 2014). Liou (2011) examined organizational commitment which they operationalized as nurse responses on the Mowday et al. (1979) Organizational Commitment Questionnaire and found statistically significant associations among organizational commitment, nursing practice

environment, and intent to leave in a sample of Asian-born nurses working in United States hospitals.

Nursing Practice Environment and Process of Care

Only four of the thirty-three studies examined associations between nursing practice environment and process of care. The Agency for Healthcare Research and Quality defines processes of care as actions which healthcare professionals do, accepted recommendations for clinical practice, and the care that can be expected to improve or maintain health (AHRQ, 2011). Processes of care evaluated in the literature include care left undone (Flynn et al., 2009), nurse-physician communication (Blake et al., 2013), professional competence (Numminen et al., 2016), and safety behaviors and actions (Friese et al., 2016). Care left undone was operationalized as nurse report of necessary care activities left undone, due to a lack of time to complete them, on their last shift worked. Flynn et al. (2009) found, controlling for workload, less supportive practice environments (OR= 4.6, [1.96, 10.78], $p<.01$) and three or more care activities left undone (OR= 2.68, [1.17, 6.14], $p<.05$) were significant predictors of burnout, and nurse burnout was a significant predictor of staff nurse intent to leave their position (OR= 3.0, [1.7, 5.0], $p<.01$) and employer (OR= 2.70, [1.59, 5.86], $p<.01$). Nurse-physician communication was operationalized as nurse responses on the ICU Nurse-Physician Communication Questionnaire which were significantly correlated with domains of the nursing practice environment, however, only the nursing manager ability, leadership, and support for nursing domain of the nursing practice environment remained a significant predictor of intent to leave in multivariate analyses (Blake et al., 2013).

Professional competence was defined as “nurses’ capacity to act and integrate knowledge, attitudes, and values” in context (Numminen et al., 2016, p. E2). This concept was operationalized as nurse responses on the Nurse Competence Scale which demonstrated a weak, but statistically significant, positive relationship ($r = 0.241$, $p < .001$) with the nursing practice environment (Numminen et al., 2016). Numminen et al. (2016) found nurses perceiving a positive practice environment reported high competence, never or seldom intending to leave their job or the profession, satisfaction with quality of care in their work setting, and satisfaction with their job orientation. A two-way effect was identified among the staffing and resource adequacy domain of the nursing practice environment, high satisfaction with quality of care, and low intent to leave either one’s job or the nursing profession (Numminen et al., 2016).

Safety behaviors and actions were operationalized as nurses’ report on the Safety Organizing Scale on which higher scores are indicative of frequent performance of safety behaviors and actions (Frieze et al., 2016). Safety behaviors and actions were found to be significantly associated with the foundations for quality care ($\beta = 0.64$, SE 0.10, $p < .001$), participation in practice affairs ($\beta = 0.18$, SE 0.07, $p < .01$), and collegial nurse-physician relations ($\beta = 0.26$, SE 0.10, $p = .01$) domains of the nursing practice environment (Frieze et al., 2016). Participation in practice affairs and collegial nurse-physician relations were also found to be significant predictors of staff nurse intent to stay (Frieze et al., 2016). Intent to stay was evaluated rather than intent to leave due to the small percentage (8.2%) of nurses reporting intent to leave.

Methodology

Methodology are reflective of the theoretical concepts and propositions purported to guide this body of literature. Literature appearing atheoretical demonstrate consistency in conceptual terminology and definitions apart from the interchangeable use of the terms “work environment” and “practice environment” and the variability in how intent to leave is defined and operationalized. Most of the empirical studies utilized a quantitative approach. One study employed a qualitative descriptive design (Flinkman & Salanterä, 2015) and two additional studies employed mixed method approaches (Van den Heede et al., 2013; Zander et al., 2013). Three studies conducted robust psychometric testing on the Practice Environment Scale of the Nursing Work Index (PES-NWI) (Fuentelsaz-Gallego et al., 2013; Gasparino & Guirardello, 2017) and a researcher-developed measure of the nursing practice environment (Choi et al., 2013) and additionally evaluated the relationship of the nursing practice environment with staff nurse outcomes.

Instruments

The National Quality Forum endorsed the PES-NWI as the gold standard for measurement of the nursing practice environment in 2004 and a new measure specification is currently under review by the Patient Safety Portfolio Standing Committee for continued endorsement (National Quality Forum, 2019). Most of the studies utilized the PES-NWI, a translation, a version, or a modification such as the PES-NWI-Revised (Goh & Lopez, 2016a, 2016b) to examine the nursing practice environment or work environment. Other measures included the Nursing Work Index (NWI) Brazilian version long and short forms (Panunto & Guirardello, 2013; Alves et al.,

2017), the NWI-Revised (Hinno et al., 2012; Van Bogaert et al., 2014), and a researcher developed 72-item measure (Choi et al., 2013).

Culture

It is evident across this literature that cultural factors to include orientation, migration, and acculturation have a significant effect on nurses' perception of the nursing practice environment and nurse intent to leave as an indicator of attrition (Cheng & Liou, 2011; Goh & Lopez, 2016b; Zander et al., 2013). Only twelve of the thirty-three studies were performed in the United States (Aiken & Poghosyan, 2009; Blake et al., 2013; Cheng & Liou, 2011; Flynn, Thomas-Hawkins, & Clarke, 2009; Friese et al., 2016; Gabriel et al., 2013; Hiler et al., 2018; Kutney-Lee et al., 2015; Patrician et al., 2010; Shang et al., 2013). It is likely that the associations identified in studies conducted prior to 2009 in the United States encouraged the adaptation and translation of instruments for examining the nursing practice environment in other countries, among other cultures, and outside acute care settings. One study examined Asian-born nurses working in United States hospitals (Cheng & Liou, 2011). Nations represented by the remaining studies include Armenia, Australia, Belgium, Brazil, Canada, China, Finland, Germany, Netherlands, Russia, South Korea, Singapore, Spain, Taiwan, Thailand, and Turkey.

Knowledge Gaps

The significant findings and identified gaps in this body of literature support the need for this proposed research examining staff nurse perceptions of the nursing practice environment in ambulatory primary care settings. Only two of the thirty-three studies reviewed from the past decade examined nurses working in ambulatory care settings (Flynn et al., 2009; Friese et al., 2016). The Army Medical Department oversees the

primary care provided to 3.9 million beneficiaries annually by approximately 107 clinics. In comparison to the majority of samples in this body of literature, Army nursing is characterized by higher percentages of male nurses as well as rich racial and ethnic diversity (Patrician et al., 2010). Military and federal civilian rank structures and Army nursing staffing models are unique to this population and may influence nurse perceptions of the nursing practice environment and nurse intent to leave (Patrician et al., 2017; Patrician et al., 2010). An examination of the relationship between nursing practice environment and staff nurse intent to leave, as an indicator of potential attrition, among United States Army primary care clinics will address the identified gaps in this literature.

Conceptual Model

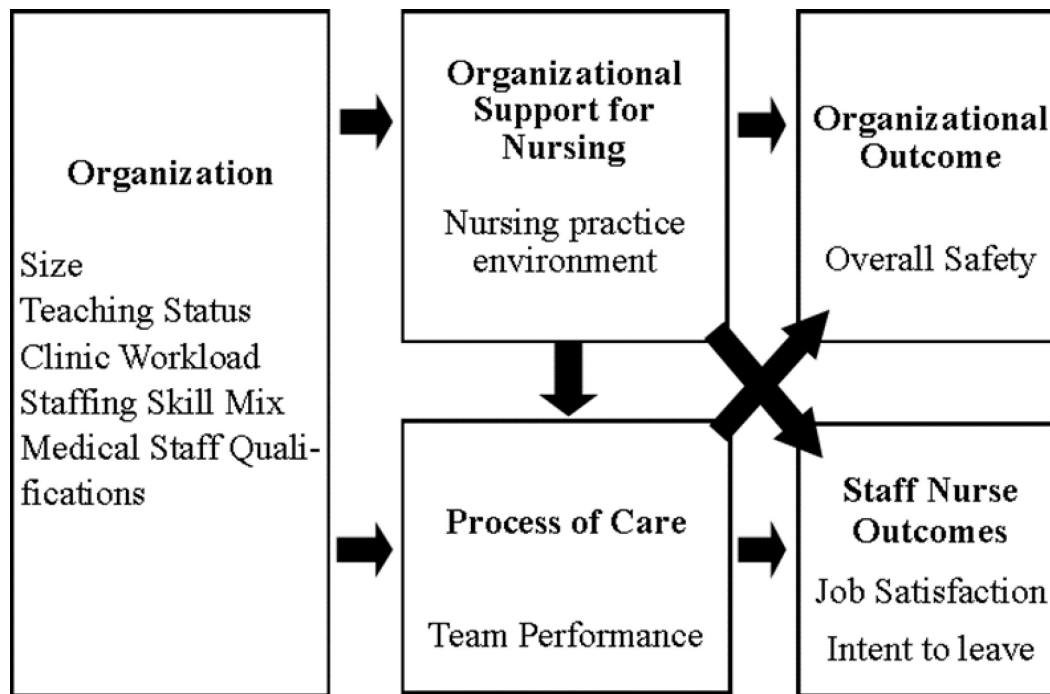
Several theoretical models guided the various studies examining the nursing practice environment and its relationship to patient outcomes, process of care, nurse outcomes, and organizational outcomes. Twenty-two articles appear atheoretical, likely due to word and page restrictions enforced by the publishing journal. Four studies were guided by the Nursing Organization and Outcomes Model (NOOM), however, three of the four do not explicitly name the model (Flynn et al., 2009; Liu et al., 2012; Patrician et al., 2010; Shang et al., 2013). These three studies reference early empirical studies guided by the NOOM (Patrician et al., Liu et al., 2012; 2010; Shang et al., 2013). The American Nurses Credentialing Center's Forces of Magnetism (Aiken & Poghosyan, 2009; Van den Heede et al., 2013), the American Association of Critical Care Nurses' Healthy Work Environment framework (Blake et al., 2013), the Patient Care Delivery Model (Roche et al., 2016), and the Quality Health Outcomes Model (Nantsupawat et al., 2017) were each utilized to guide individual studies. One study reported that the conceptual model guiding

their study integrated the Push-Pull theory of migration with Herzburg's Two-Factor theory (Goh & Lopez, 2016b). Hiler et al. (2018) stated that a transactional model of stress and coping guided their research.

The NOOM is an expansion on Donabedian's Quality Medical Care model (Donabedian, 1966). Donabedian postulates that healthcare quality is the result of structures influencing processes which influence outcomes (Donabedian, 1966). Aiken, Sochalski, and Lake (1997) first introduced a brief description of the NOOM. Another brief narrative and accompanying figure depicting the NOOM was presented by Aiken, Clark, and Sloane (2002) in a research report detailing the International Hospital Outcomes Consortium study. Currently, the NOOM lacks a dedicated theoretical source, however, the model provides the context in which Donabedian's linear structure-process-outcome model operates; specifically, for nursing. The NOOM posits that organizational support for nursing, also known as the nursing practice environment, is directly associated with process of care and staff nurse job outcomes (Aiken et al., 2002; Lake, 2002). The conceptual model for this proposed study is depicted in Figure 1.

Figure 1.

Conceptual Model



Note. Conceptual model adapted from “Hospital staffing, organization, and quality of care: cross-national findings,” by Aiken, Clark, and Sloane, 2002, *International Journal for Quality in Health Care*, 14, 1, p. 15-13. Copyright 2002 by the International Society for Quality in Health Care and Oxford University Press.

Nursing Organization and Outcomes Model

The NOOM is a middle-range, explanatory nursing framework ideal for conceptualizing the relationships among healthcare structure, organizational support for nursing, process of care, and (a) organizational, (b) staff, and (c) beneficiary outcomes (Aiken et al., 2002). Aiken, Clarke, and Sloane (2002) identify five major concepts and three relational propositions. The brief narrative included in an empirical article excludes nonrelational propositions (Aiken et al., 2002). The figure accompanying the narrative in this research report depicts the identified concepts and relational propositions with additional concepts and unidirectional relationships. Empirical studies published by

Aiken prior to and subsequent this seminal research paper demonstrate the same theoretical premise, but lack theoretical clarity (Aiken et al., 2002; Aiken, Sochalski, & Lake, 1997; Aiken, Buchan, Ball, & Rafferty, 2008; Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Aiken & Patrician, 2000; Aiken & Poghusyan, 2009; Aiken, Sloane, Lake, Sochalski, & Weber, 1999; Aiken, Smith, & Lake, 1994). In review of nearly 900 empirical studies examining concepts of this model only ten studies identify the NOOM as the conceptual basis. Eight studies explicitly identify the NOOM as the conceptual basis (Choi, Flynn, & Aiken, 2012; Flynn, 2007; Flynn et al., 2009; McMullan, Thomas-Hawkins, & Shirey, 2017; Nelson & Flynn, 2015; Ogbolu, Johantgen, Zhu, & Johnson, 2015; Thomas-Hawkins & Flynn, 2015; Weaver & Lindgren, 2017). Two studies recognize the NOOM as the International Hospital Consortium Outcomes model (Schubert et al., 2008; Shang et al., 2013).

In 1999, Lake expanded the NOOM to include the nursing practice environment, a contemporary of the organizational support for nursing concept, in an article detailing the construction and psychometric testing of the Practice Environment Scale of the Nursing Work Index (PES-NWI) (Lake, 2002). Lake (2002) defines the nursing practice environment as the attributes or characteristics of an organization that either facilitate or impede the professional practice of nurses. The NOOM consists of five concepts to include hospital organization, organizational support for nursing or the nursing practice environment, process of care, nurse outcomes, and patient outcomes (Aiken et al., 2002). The NOOM depicts unidirectional relationships in which the hospital organization affects the nursing practice environment (Aiken et al., 2002). In turn, the nursing practice environment affects nurse outcomes and process of care (Aiken et al., 2002). Likewise,

nurse outcomes and process of care affect patient outcomes (Aiken et al., 2002). As depicted in 2002, the hospital organization has three dimensions to include nurse to patient ratios and staffing skill mix, surveillance and early detection, and medical staff qualifications (Aiken et al., 2002). Both Aiken and Lake address nurses as part of the hospital organization structure and posit that nurses are the perpetual surveillance system for early detection of complication (Aiken et al., 2002; Lake, 2002). Nurse staffing to include skill mix and patient to nurse ratios affect the functionality of this early detection mechanism (Aiken et al., 2002). Aiken et al. (2002) explicitly identify three relational propositions to include (a) hospital organization affects nurse and patient outcomes, (b) process of care is affected by hospital organization, and (c) process of care affects patient outcomes.

The NOOM depicts organizational support for nursing as a four-dimensional concept to include resource adequacy, nurse autonomy, nurse control, and nurse-physician relations (Aiken et al., 2002). In contrast, Lake (2002) identified five dimensions of the nursing practice environment to include (a) nurse participation in hospital affairs, (b) nursing foundations for quality of care, (c) nurse manager ability, leadership, and support of nurses, (d) staffing and resource adequacy, and (e) collegial nurse-physician relations. A positive nursing practice environment is one perceived by nurses to represent the five domains (Lake, 2002).

A significant association between the nursing practice environment and nurse outcomes to include nurse intent to leave has been empirically supported across the literature (Aiken, Clarke, Sloane, Lake, & Cheney, 2009; Flynn et al., 2009; Kutney-Lee et al., 2015; Patrician et al., 2010). The NOOM does not purport a direct relationship

between the nursing practice environment and patient outcomes (Aiken et al., 2002), however this relationship has also been empirically supported by the literature (Aiken et al., 2009; Kutney-Lee et al., 2015; Van Bogaert et al., 2014). Several studies examine the association of the nursing practice environment and process of care (Flynn et al., 2009; McMullan et al., 2017; Thomas-Hawkins & Flynn, 2015). One study identified and empirically supported a direct relationship between process of care and nurse outcomes (Flynn et al., 2009) which is an expansion of the original model in which process of care is posited to only affect patient outcomes (Aiken et al., 2002). Hospital characteristics consistently associated with nursing practice environment across the literature include bed size, teaching status, ownership, technology status, Magnet designation, and geographical location (Aiken et al., 2009; Aiken & Poghosyan, 2009; Blake et al., 2013; Choi et al., 2013; Flynn et al., 2009; Hinno et al., 2012; Kutney-Lee et al., 2015; Lee et al., 2014; Van den Heede et al., 2013). Nursing characteristics evaluated include age, gender, experience, education, and tenure (Aiken et al., 2009; Aiken & Poghosyan, 2009; Blake et al., 2013; Cheng & Liou, 2011; Choi et al., 2013; Flynn et al., 2009; Friese et al., 2016; Goh & Lopez, 2016a; Hiler et al., 2018; Kutney-Lee et al., 2015; Lee et al., 2014; Liu et al., 2012; Patrician et al., 2010; Panunto & Guirardello, 2013; Roche et al., 2016; Alves, et al. 2017; Shang et al., 2013). Only one study examined the association between nursing practice environment and patient characteristics to include race, insurance status, severity of illness, etc. (Schubert et al., 2008).

Aiken et al. (2002) posit that healthcare organizations affect patient outcomes and that nurses are strategically located within the healthcare organization for optimal reporting of these relationships. The NOOM is founded in sociology and one of several

expansions on Donabedian's Quality Medical Care model (Aiken et al., 2002; Donabedian, 1966). The International Hospital Outcomes Study, development and refinement of the Nursing Work Index, and seminoe work examining Magnet facilities shape an understanding of the worldview through which the authors of the NOOM conceived their conceptual model (Aiken et al., 2002; Aiken & Patrician, 2000; Kramer & Hafner, 1989). The NOOM is not overly prescriptive which presents the opportunity for researchers to conceptualize study variables through the integration of organizing frameworks from nursing and other disciplines. This proposed study seeks to integrate two organizing frameworks for conceptualizing study variables: the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Culture (PSC) and the Big Five in Teamwork frameworks (AHRQ, 2016; Salas et al., 2005).

The Patient Safety Culture Framework

A direct, positive relationship between the nursing practice environment and organizational outcomes has been empirically supported in the literature (Aiken et al., 2009; Aiken & Poghosyan, 2009; Friese et al., 2016; Gasparino & Guirardello, 2017; Hinno et al., 2012; Kutney-Lee et al., 2015; Patrician et al., 2010; Panunto & Guirardello, 2013; Shang et al., 2013; Tervo-Heikkinen et al., 2009). The PSC framework is a middle-range descriptive model ideal for conceptualizing healthcare organization outcomes relating to safe, quality care (AHRQ, 2016). Safe, quality care is an organizational outcome incumbent on the safety culture of an organization. The NOOM posits that nurses are the surveillance system of healthcare organizations for early detection of complications (Aiken et al., 2002). Therefore, nurses are a core component of the safety culture of an organization.

The AHRQ adopted the seminal definition of a safety culture proposed by the Advisory Committee on the Safety of Nuclear Installations which describes safety culture as the combination of individual and group values, attitudes, perceptions, competencies, and behavior patterns in determining the organizations' safety commitment, style, and proficiency regarding the management of health and safety (Study Group on Human Factors, 1994). The committee suggests that a positive safety culture possesses the characteristics of open communication, mutual trust, shared perception of safety importance, and confidence in preventive measure efficacy (Study Group on Human Factors, 1994). The PSC framework describes the domains of a safety culture which may be conceptualized as organizational outcomes operationalized as staff perception of the effectiveness of the structures and processes within these domains, or overall perception of patient safety. The PSC framework includes twelve domains of a safety culture (AHRQ, 2016). Domains and their definitions are provided in Table 1.

Table 1.

Dimensions of Overall Perception of Patient Safety with Definitions

Dimension of Patient Safety	Definition
Communication openness	Staff freely speaking out concerning circumstances that may negatively affect a patient and the freedom to question authority
Feedback and communication about error	An informed staff concerning errors that occur, feedback concerning subsequent changes, and open discussion concerning error prevention
Frequency of events reported	Includes (a) mistakes caught and corrected prior to error affecting a patient, (b) mistakes lacking potential for patient harm, and (c) mistakes with potential for patient harm that have not harmed a patient
Handoff and transitions	Important patient information movement across units and within units

Management support for patient safety	The provision of a work climate that promotes patient safety as a top priority by hospital management personnel
Nonpunitive response to error	Staff perception that their mistakes and event reports are not recorded within their personnel file or negatively reflect on them
Organizational learning and continuous improvement	Procedures and systems effective at preventing error and a lack of patient safety problems
Staffing	Adequate personnel to handle the workload and appropriate work hours to provide the best care for patients
Supervisor/Manager expectations and actions promoting patient safety	Supervisor and/or manager consideration of staff suggestions for improving patient safety, praise of staff for following patient safety procedures, and not overlooking patient safety problems
Teamwork across units	The cooperation and coordination of units with one another to provide the best care for patients
Teamwork within units	Staff support, treating one another with respect, and working together as a team
Patient safety grade	The perception of unit performance on patient safety as viewed by healthcare organization unit or clinic staff
Number of events reported	An aggregate number of the mistakes reported over the past year

Note. Definitions from the Patient Safety Culture Framework (AHRQ, 2016).

The Big Five in Teamwork

The Big Five in Teamwork framework posits two teamwork processes including team performance and task objectives (Salas et al., 2005). Team performance has been defined as the current operational and functional state of a team within an organization and is recognized as a stable concept (AHRQ, 2010). Therefore, team performance is best suited for examination across geographical locations, staff, and beneficiaries. The Army Medical Department includes approximately 107 primary care clinics located around the globe (Defense Health Agency, 2014). The military staff in these clinics regularly rotate to new duty positions and locations every two to three years and irregularly participate in deployments for humanitarian and military operations, military and civilian school

attendance, and various trainings affecting the continuity of care (Defense Health Agency, 2014). The beneficiaries cared for by each of these clinics are also rotating on regular and irregular bases. Team performance is especially ideal for examination of the transient target population for this study.

Team performance, as a process of care, has not been evaluated in the recent literature for associations with the nursing practice environment and intent to leave, as an indicator of nurse attrition. However, the recent literature empirically supports the theorized relationships among nursing practice environment, process of care, and nurse outcomes to include intent to leave (Friese et al., 2016; Numminen et al., 2016). Processes of care evaluated in the literature include care left undone (Flynn et al., 2009), nurse-physician communication (Blake et al., 2013), professional competence (Numminen et al., 2016), and safety behaviors and actions (Friese et al., 2016). Each of these processes demonstrate a significant, positive relationship with the nursing practice environment and a significant, inverse relationship with nurse intent to leave (Aiken et al., 2009; Flynn et al., 2009; Friese et al., 2016; Numminen et al., 2016).

Hypotheses

Based on the above theoretical rationale, the following hypotheses are proposed:

1. US Army primary care clinic nursing practice environments, operationalized as staff nurse responses on the PES-NWI, will be
 - a) Positively associated with team performance; operationalized as clinic staff responses on the TeamSTEPPS Teamwork Perceptions Questionnaire (T-TPQ).

- b) Positively associated with staff nurses' job satisfaction;
operationalized as staff nurse responses on a single item measure.
 - c) Positively associated with staff perception of overall safety;
operationalized as clinic staff responses on the Military Health System Patient Safety Culture Survey (PSCS).
 - d) Negatively associated with staff nurses' intent to leave;
operationalized as staff nurse responses on a single item measure.
- 2. US Army primary care clinic team performance, operationalized as clinic staff responses on the T-TPQ, will be
 - a) Positively associated with staff perception of overall safety; operationalized as clinic staff responses on the Military Health System PSCS.
 - b) Positively associated with staff nurses' job satisfaction; operationalized as staff nurse responses on a single item measure.
 - c) Negatively associated with staff nurses' intent to leave; operationalized as staff nurse responses on a single item measure.
- 3. US Army primary care clinic team performance will mediate the relationship between nursing practice environment and
 - a) Staff perception of overall safety.
 - b) Staff nurses' job satisfaction.
 - c) Staff nurses' intent to leave.

Chapter Three

This dissertation research study is a cross-sectional, correlational study examining secondary data collected by the Army Nurse Corps and the Military Health System in fiscal year 2016. Numerous variables may influence staff perception of overall safety, staff nurse job satisfaction, and staff nurse intent to leave. Most importantly, a cross-sectional design examining secondary data is the most feasible for examining the highly mobile and ever-changing military primary care environment. Secondary data were requested from the Army Nurse Corps Chief's office and the DHA Patient Safety Directorate and the Strategy, Planning and Functional Integration Directorate's Analytics and Evaluation Division. The research design and methods will be presented in this chapter.

Description of Research Setting

In accordance with a Data Use Agreement between the Primary Investigator (PI) and the Defense Health Agency and another between the PI and the Army Nurse Corps, the study site for this research is the School of Nursing, Ackerson Hall, at Rutgers, the State University of New Jersey on the Newark Campus. Secondary data were secured by the PI, CPT Melissa Miller, through the appropriate channels and maintained on a non-network connected laptop computer secured in a locked file cabinet in the locked office of the dissertation committee chairperson, Dr. Mary Johansen. Access to the locked office and file cabinet is limited to CPT Miller and Dr. Mary Johansen, and access to sign-in on the non-network connected laptop computer is limited to CPT Miller.

Sample

Army Nurse Corps data include responses from active duty military and civilian government service RNs and LPNs assigned to primary care clinics within Army medical treatment facilities. In military samples, composite scores on the PES-NWI demonstrate no statistically significant differences between RNs and LPNs or between inpatient and outpatient care settings (Swiger, Raju, Breckenridge-Sproat, & Patrician, 2017). The former is likely due to the influence of the hierarchical rank structure in Army nursing and the increased responsibility on both RNs and LPNs for continued professional development to include continued military and civilian education, participation on unit and hospital committees, professional development, and the expectation to advance in leadership education, training, and formal leadership roles. The use of both RN and LPN responses for analyses reflects the Army Nurse Corps commitment to the nursing team. The Army Nurse Corps recognizes that both RN and LPN members of the nursing team and their unique skills and abilities are equally necessary for the health and well-being of the fighting force, military families, and all Department of Defense beneficiaries (Breckenridge-Sproat et al., 2015).

The data include nurse responses to questions concerning job satisfaction, intent to leave, and 31 PES-NWI items measuring the nature of their nursing practice environment to include nurse participation in hospital affairs, nursing foundations for quality care, nurse manager ability, leadership, and support for nurses, staffing and resource adequacy, and collegial nurse-physician relations (Lake, 2002). Advanced practice nurses assigned to these clinics were excluded due to their adherence to a medical, rather than nursing, care model and their provider role similar to physicians.

Ambulatory care clinics to include primary care clinics tend to follow a medical model in general, however, nursing care plans and nursing diagnoses utilized in ambulatory care are based on a nursing care model. Nurse officers in charge (military or civilian government service nurse managers) and non-commissioned officers in charge (military or civilian government service assistant nurse managers) were excluded due to their position as first-line leaders of staff nurses and their status as subordinate to a higher level of medical treatment facility management and leadership. Army medics and certified nursing assistants assigned to primary care clinics are supervised by professional nurses assigned to Army primary care clinics and are not required to complete the National Council Licensure Examination. While important members of the primary care team, these non-nurse members were excluded from the study sample. Additionally, nurse managers and assistant managers will participate differently in the organization and are responsible for quality care, leadership and support of nurses, adequate staffing and resources, and ensuring collegial nurse-physician relations – items which the survey measures. Including these leaders may potentiate biased responses. Army Nurse Corps sample descriptives are presented in Table 2.

Table 2.

Army Nurse Corps Primary Care Clinic Sample Descriptives by Military Treatment Facility

Clinic	Military Treatment Facility Type	Nurse Type	Nurse Role	Service Type
1	Small Hospital	RN – 67% LPN – 33%	Direct – 67% Case Mg – 33%	Military – 67% Civilian – 33%
2	Small Hospital	RN – 12% LPN – 88%	Direct – 96% Case Mg – 4%	Military – 25% Civilian – 75%
3	Large Hospital	RN – 38% LPN – 62%	Direct – 88% Case Mg – 12%	Military – 22% Civilian – 78%
4	Small Hospital	RN – 46% LPN – 54%	Direct – 92% Case Mg – 8%	Military – 15% Civilian – 85%

5	Small Hospital	RN – 25% LPN – 75%	Direct – 88% Case Mg – 12%	Military – 12% Civilian – 88%
6	Small Hospital	RN – 50% LPN – 50%	Direct – 100% Case Mg – 0%	Military – 20% Civilian – 80%
7	Large Hospital	RN – 37% LPN – 63%	Direct – 85% Case Mg – 15%	Military – 11% Civilian – 89%
8	Large Clinic	RN – 46% LPN – 54%	Direct – 92% Case Mg – 8%	Military – 15% Civilian – 85%
9	Large Clinic	RN – 54% LPN – 46%	Direct – 69% Case Mg – 31%	Military – 8% Civilian – 92%
10	Small Hospital	RN – 75% LPN – 25%	Direct – 75% Case Mg – 25%	Military – 50% Civilian – 50%
11	Medium Clinic	RN – 67% LPN – 33%	Direct – 100% Case Mg – 0%	Military – 33% Civilian – 67%
12	Medium Clinic	RN – 58% LPN – 42%	Direct – 92% Case Mg – 8%	Military – 18% Civilian – 83%
13	Small Clinic	RN – 25% LPN – 75%	Direct – 100% Case Mg – 0%	Military – 0% Civilian – 100%
14	Small Clinic	RN – 57% LPN – 43%	Direct – 86% Case Mg – 14%	Military – 14% Civilian – 86%
15	Large Clinic	RN – 35% LPN – 65%	Direct – 100% Case Mg – 0%	Military – 13% Civilian – 87%
16	Small Clinic	RN – 67% LPN – 33%	Direct – 100% Case Mg – 0%	Military – 33% Civilian – 67%
17	Medium Clinic	RN – 22% LPN – 78%	Direct – 100% Case Mg – 0%	Military – 0% Civilian – 100%
18	Medium Clinic	RN – 26% LPN – 74%	Direct – 96% Case Mg – 4%	Military – 11% Civilian – 89%
19	Large Clinic	RN – 67% LPN – 33%	Direct – 58% Case Mg – 42%	Military – 25% Civilian – 75%
20	Small Clinic	RN – 73% LPN – 27%	Direct – 100% Case Mg – 0%	Military – 47% Civilian – 53%
21	Medium Clinic	RN – 40% LPN – 60%	Direct – 80% Case Mg – 20%	Military – 20% Civilian – 80%
22	Medium Clinic	RN – 45% LPN – 55%	Direct – 91% Case Mg – 9%	Military – 18% Civilian – 73%
23	Small Clinic	RN – 100% LPN – 0%	Direct – 100% Case Mg – 0%	Military – 0% Civilian – 100%
24	Small Clinic	RN – 60% LPN – 40%	Direct – 100% Case Mg – 0%	Military – 40% Civilian – 60%
25	Medical Center	RN – 43% LPN – 57%	Direct – 83% Case Mg – 17%	Military – 13% Civilian – 87%
26	Medical Center	RN – 36% LPN – 64%	Direct – 86% Case Mg – 14%	Military – 7% Civilian – 93%
27	Medical Center	RN – 43% LPN – 57%	Direct – 86% Case Mg – 14%	Military – 14% Civilian – 86%
28	Medical Center	RN – 70% LPN – 30%	Direct – 100% Case Mg – 0%	Military – 20% Civilian – 80%
29	Medical Center	RN – 73% LPN – 27%	Direct – 93% Case Mg – 7%	Military – 27% Civilian – 73%
30	Community-based Medical Home	RN – 33% LPN – 67%	Direct – 100% Case Mg – 0%	Military – 0% Civilian – 100%
31	Community-based Medical Home	RN – 67%	Direct – 67%	Military – 0%

		LPN – 33%	Case Mg – 33%	Civilian – 100%
32	Community-based Medical Home	RN – 20% LPN – 80%	Direct – 100% Case Mg – 0%	Military – 10% Civilian – 90%
33	Community-based Medical Home	RN – 33% LPN – 67%	Direct – 100% Case Mg – 0%	Military – 0% Civilian – 100%
34	Community-based Medical Home	RN – 67% LPN – 33%	Direct – 67% Case Mg – 33%	Military – 17% Civilian – 83%
35	Community-based Medical Home	RN – 33% LPN – 67%	Direct – 100% Case Mg – 0%	Military – 17% Civilian – 83%
36	Large Clinic	RN – 29% LPN – 71%	Direct – 93% Case Mg – 7%	Military – 21% Civilian – 79%
37	Medical Center	RN – 56% LPN – 44%	Direct – 100% Case Mg – 0%	Military – 22% Civilian – 78%
38	Community-based Medical Home	RN – 33% LPN – 67%	Direct – 100% Case Mg – 0%	Military – 0% Civilian – 100%
39	Community-based Medical Home	RN – 43% LPN – 57%	Direct – 86% Case Mg – 14%	Military – 14% Civilian – 86%

Note. Direct is direct patient care greater than 50% of the time; Mg. - management

Matched data were available for the analysis of thirty-nine primary care clinics. These clinics represent approximately 35% of the Army's primary care clinics. Army Primary Care clinic descriptives to include clinic name, region, military treatment facility size designation, and percentages of clinic staff respondents by role are presented in Table 3. Just as with the PES-NWI, respondents are asked to evaluate their management and leadership on both the T-TPQ and Military Health System PSCS. Therefore, administration to include management and executive staff, commanders, and officers and non-commissioned officers in charge were excluded from the sample. The inclusion of responses from these clinic staff may introduce response bias. Administration included clerks and receptionists. Technicians and assistants include Army medics, certified nurses' aides, and other medical technicians. Nursing staff included RN and LPN respondents. Providers in Army primary care clinics included Physicians, Physician's Assistants, and Nurse Practitioners. Other clinic staff include other specialty staff specifically assigned to the family practice clinic such as therapists or social workers.

Table 3.*Army Primary Care Clinic Sample Descriptives*

#	Facility Size	Staff	
		T-TPQ	PSCS
1	Community-based Medical Home	Nursing – 88.9% Providers – 11.1%	Administrative – 12.5% Nursing – 75.0% Providers – 12.5%
2	Community-based Medical Home	Technician/Assistant – 5.6% Nursing – 72.2% Providers – 22.2%	Nursing – 93.8% Providers – 6.2%
3	Community-based Medical Home	Nursing – 85.7% Providers – 14.3%	Nursing – 81.8% Providers – 18.2%
4	Community-based Medical Home	Administrative – 2.3% Technician/Assistant – 7.0% Nursing – 72.0% Providers – 14.0% Other – 4.7%	Administrative – 22.2% Nursing – 66.7% Providers – 11.1%
5	Medium Clinic	Administrative – 12.5% Nursing – 62.5% Providers – 25.0%	Administrative – 10.5% Technician/Assistant – 21.1% Nursing – 42.1% Providers – 26.3%
6	Medium Clinic	Administrative – 3.6% Technician/Assistant – 3.6% Nursing – 75.0% Providers – 14.2% Other – 3.6%	Administrative – 7.7% Technician/Assistant – 7.7% Nursing – 53.8% Providers – 30.8%
7	Medium Clinic	Technician/Assistant – 6.2% Nursing – 62.5% Providers – 18.8% Other – 12.5%	Administrative – 4.5% Technician/Assistant – 18.2% Nursing – 59.1% Providers – 18.2%
8	Large Clinic	Administrative – 4.8% Technician/Assistant – 19.0% Nursing – 52.4% Providers – 14.3% Other – 9.5%	Administrative – 6.9% Nursing – 69.0% Provider – 24.1%
9	Large Clinic	Administrative – 16.6% Technician/Assistant – 5.6% Nursing – 50.0% Providers – 22.2% Other – 5.6%	Administrative – 16.6% Technician/Assistant – 5.6% Nursing – 50.0% Providers – 22.2% Other – 5.6%
10	Small Hospital	Nursing – 66.6% Providers – 16.6% Other – 16.6%	Nursing – 57.1% Providers – 14.3% Other – 28.6%
11	Medical Center	Administrative – 9.6% Technician/Assistant – 1.9% Nursing – 36.5% Providers – 30.8% Other – 21.2%	Administrative – 4.6% Nursing – 72.7% Providers – 22.7%
12	Community-based Medical Home	Nursing – 100%	Nursing – 75.0% Providers – 25%
13	Community-based Medical Home	Technician/Assistant – 16.7% Nursing – 50.0% Providers – 33.3%	Nursing – 88.9% Providers – 11.1%
14	Community-based Medical Home	Nursing – 100%	Nursing – 100%
15	Small Clinic	Administrative – 4.9 % Nursing – 53.7%	Technician/Assistant – 9.1% Nursing – 72.7%

		Providers – 29.2% Other – 12.2%	Providers – 18.2%
16	Medium Clinic	Administrative – 3.3% Nursing – 86.7% Providers – 6.7% Other – 3.3%	Technician/Assistant – 6.3% Nursing – 81.3% Providers – 12.5%
17	Large Clinic	Administrative – 14.5% Technician/Assistant – 12.9% Nursing – 58.0% Providers – 6.5% Other – 8.1%	Administrative – 6.9% Nursing – 82.8% Providers – 10.3%
18	Large Clinic	Administrative – 7.5% Technician/Assistant – 9.4% Nursing – 62.3% Providers – 17.0% Other – 3.8%	Nursing – 90.0% Providers – 10.0%
19	Small Hospital	Technician/Assistant – 12.5% Nursing – 75.0% Provider – 12.5%	Technician/Assistant – 6.7% Nursing – 80.0% Providers – 13.3%
20	Large Hospital	Administrative – 20.5% Technician/Assistant – 7.7% Nursing – 48.7% Providers – 23.1%	Technician/Assistant – 8.6% Nursing – 77.1% Physician – 14.3%
21	Large Hospital	Administrative – 12.5% Technician/Assistant – 6.3% Nursing – 46.8% Providers – 18.8% Other – 15.6 %	Administrative – 6.7% Nursing – 53.3% Providers – 40.0%
22	Medical Center	Nursing – 73.7% Providers – 21.0% Other – 5.3%	Administrative – 10.0% Nursing – 60.0% Providers – 30.0%
23	Medical Center	Administrative – 7.5% Technician/Assistant – 4.7% Nursing – 60.4% Providers – 23.6% Other – 3.8%	Administrative – 8.7% Technician/Assistant – 4.3% Nursing – 65.3% Providers – 21.7%
24	Medium Clinic	Administrative – 20.0% Technician/Assistant – 15.0% Nursing – 42.5% Physician – 12.5% Other – 10.0%	Administrative – 19.3% Technician/Assistant – 9.7% Nursing – 58.1% Providers – 12.9%
25	Large Clinic	Administrative – 14.3% Technician/Assistant – 19.0% Nursing – 38.1% Providers – 19.0% Other – 9.6%	Administrative – 8.7% Technician/Assistant – 4.4% Nursing – 65.2% Providers – 21.7%
26	Small Hospital	Administrative – 15.4% Technician/Assistant – 3.9% Nursing – 53.8% Providers – 15.4% Other – 11.5%	Nursing – 80.0% Providers – 20.0%
27	Small Hospital	Administrative – 14.3% Technician/Assistant – 7.1% Nursing – 52.4% Providers – 16.7% Other – 9.5%	Administrative – 10.5% Nursing – 73.7% Providers – 15.8%
28	Small Hospital	Technician/Assistant – 10.0% Nursing – 60.0% Providers – 20.0% Other – 10.0%	Technician/Assistant – 10.5% Nursing – 73.7% Providers – 15.8%

29	Medical Center	Administrative – 5.0% Technician/Assistant – 10.0% Nursing – 70.0% Providers – 10.0% Other – 5.0%	Administrative – 7.7% Nursing – 61.5% Providers – 30.8%
30	Small Clinic	Technician/Assistant – 70.0% Providers – 30.0%	Administrative – 3.6% Technician/Assistant – 35.6% Nursing – 28.6% Providers – 28.6% Other – 3.6%
31	Small Clinic	Administrative – 7.1% Technician/Assistant – 28.6% Nursing – 21.4% Providers – 14.3% Other – 28.6%	Technician/Assistant – 33.3% Nursing – 33.3% Providers – 33.3%
32	Small Clinic	Administrative – 8.1% Technician/Assistant – 16.2% Nursing – 59.5% Providers – 13.5% Other – 2.7%	Administrative – 14.3% Technician/Assistant – 14.3% Nursing – 42.8% Providers – 28.6%
33	Small Clinic	Technician/Assistant – 9.5% Nursing – 38.1% Providers – 52.4%	Technician/Assistant – 15.4% Nursing – 61.5% Providers – 23.1%
34	Small Clinic	Technician/Assistant – 25.0% Nursing – 37.5% Providers – 25.0% Other – 12.5%	Technician/Assistant – 16.7% Nursing – 33.3% Providers – 50.0%
35	Medical Center	Administrative – 3.7% Technician/Assistant – 7.4% Nursing – 59.3% Providers – 22.2% Other – 7.4%	Technician/Assistant – 50.0% Nursing – 25.0% Providers – 25.0%
36	Small Hospital	Administrative – 8.3% Technician/Assistant – 16.7% Nursing – 66.7% Other – 8.3%	Nursing – 100%
37	Medical Center	Administrative – 6.7% Technician/Assistant – 6.7% Nursing – 30.0% Providers – 23.3% Other – 33.3%	Administrative – 4.9% Nursing – 73.2% Providers – 21.9%
38	Community-based Medical Home	Nursing – 70.0% Providers – 20.0% Other – 10.0%	Nursing – 100%
39	Medium Clinic	Nursing – 100%	Administrative – 7.7% Technician/Assistant – 19.2% Nursing – 42.3% Providers – 30.8%

Instruments

Practice Environment Scale of the Nursing Work Index

The PES-NWI was first endorsed by the National Quality Forum in 2009 and a new measure specification was endorsed 11 June 2019 by the Patient Safety Portfolio

Standing Committee for continued endorsement (National Quality Forum, 2019). This instrument is a thirty-one item, self-report survey soliciting staff nurses' perception of the five dimensions of their NPE (Lake, 2002). Each of the 31 items ask nurses to assess whether each item is present in their practice environment by responding on a four-point Likert-type scale; strongly disagree, somewhat disagree, somewhat agree, strongly agree (Lake, 2002). The PES-NWI may be used as a composite score for the NPE calculated as the average score of the five subscales or individual subscales may be utilized to represent (a) nursing participation in hospital affairs, (b) nursing foundations for quality and safety, (c) nurse manager ability, leadership, and support of nurses, (d) staffing and resource adequacy, and (e) collegial nurse-physician relations (Lake, 2002). The PES-NWI demonstrates strong internal consistency across the literature with Cronbach's alphas ranging from .94-.96 for samples of staff RNs working in outpatient and ambulatory care settings (Choi et al., 2012; Flynn et al., 2010; Flynn et al., 2012; Flynn et al., 2009; Jarin et al., 2014; Swiger, Raju, Breckenridge-Sproat, & Patrician, 2017). Lake details criterion, content, and construct validity testing in the original article detailing development and psychometric testing (Lake, 2002). In military samples, composite scores on the PES-NWI demonstrate no statistically significant differences between RNs and LPNs or between inpatient and outpatient care settings, however, subscale scores do demonstrate significant differences (Swiger et al., 2017).

TeamSTEPPS Teamwork Perceptions Questionnaire

The T-TPQ is a multidimensional assessment of team performance (AHRQ, 2010). Dimensions of team performance measured by subscales of the T-TPQ include team structure, situation monitoring, mutual support, and communication (AHRQ, 2010).

Each subscale of the T-TPQ is scored individually to render five composite scores of which higher scores are indicative of greater team effectiveness (AHRQ, 2010).

Several TeamSTEPPS experts served as item writers for the development of the T-TPQ (AHRQ, 2010). Iterative review of the item pool resulted in fifty items reviewed during cognitive interviews with five healthcare professionals (AHRQ, 2010). Three of the fifty items were deleted, several items were reworded to reduce confusion (AHRQ, 2010). A small group trial using the resulting forty-seven items and an additional eight items from the Hospital Survey on Patient Safety Culture (HSOPS™) resulted in moderate agreement (AHRQ, 2010, 2016). The same forty-seven items and an additional four items from the HSOPS™ were administered to 169 healthcare professionals at the completion of a TeamSTEPPS training event and the findings from interitem correlations among this sample resulted in the deletion of twelve additional items (AHRQ, 2010, 2016).

The final version of the T-TPQ includes thirty-five items divided evenly among the five subscales each measuring one of the five domains of team performance (AHRQ, 2010). Convergent validity was tested in comparison to the HSOPS™ work area subscale (AHRQ, 2010, 2016). Cronbach's alpha reliability coefficients for the T-TPQ composites are presented in Table 2. A 2014 report detailing a confirmatory factor analysis of the T-TPQ in a sample of 1700 Army healthcare professionals demonstrated model fit, validity and Cronbach's alphas for the composite measures comparable to the original reliability testing: .917, .927, .943, .920, and .939 respectively (Keebler et al., 2014).

Military Health System Patient Safety Culture Survey

The MHS PSCS is adapted from the HSOPSTM (AHRQ, 2016). Items remain the same, however, item language is adjusted for military terminology. This survey solicits the perceptions of healthcare staff regarding twelve domains of a safety culture to include communication openness, feedback and communication about error, frequency of events reported, handoffs and transitions, management support for patient safety, nonpunitive response to error, organizational learning and continuous improvement, overall perception of patient safety, staffing, supervisor/manager expectations and actions promoting safety, teamwork across units, and teamwork within units (AHRQ, 2016). In addition, a single-item measure of patient safety grade asks respondents to assess the overall patient safety on a five-point, Likert-type scale; responses include excellent, very good, acceptable, poor, and failing (Agency for Healthcare Research and Quality, 2016). A second single-item measure asks respondents to report the number of patient safety events reported in the last year on a Likert-type scale including six responses; no events reported, 1-2 events, 3-5 events, 6-10 events, 11-20 events, and 21 or more events (AHRQ, 2016). The HSOPSTM user guide briefly discusses the development of the survey through an extensive literature review, interviews with patient safety experts and hospital staff, development of an item pool, cognitive interviews, and input from The Joint Commission, researchers, and professional organizations (AHRQ, 2016). A large multilevel psychometric study was performed to examine the dimensionality of the HSOPSTM and findings are presented in Table 4 (Sorra & Dyer, 2010).

Table 4.*Empirical Indicator Original Sample, Validity Testing, and Reliability Coefficients*

Practice Environment Scale of the Nursing Work Index (PES-NWI)			
Source	Original Sample	Validity	Reliability
Lake (2002)	11,636 Registered Nurses working in Pennsylvania acute care settings - 16 Magnet facilities with 200-300 bed capacity - VA or County hospitals with 700+ bed capacities	The PES-NWI was compared to the Nursing Work Index (NWI). Development of the PES-NWI occurred concurrently with research efforts to revise the NWI. The psychometric article declares significant overlap (45 items) between items selected for the PES-NWI and revised NWI (Lake, 2002). Further details are not provided.	Cronbach's alpha: 1. Nurse participation in hospital affairs = .83 2. Nursing foundations for quality of care = .80 3. Nurse manager ability, leadership, and support for nursing = .84 4. Staffing and resource adequacy = .80 5. Collegial nurse-physician relations = .71 Composite = .82
TeamSTEPPS Teamwork Perceptions Questionnaire (T-TPQ)			
Source	Original Sample	Validity	Reliability
AHRQ (2010)	169 Healthcare Workers - 32.6% nurses	Face Validity (expert interviews) Convergent Validity (HSOPS) Composite = .81 1. Team Structure = .64 ($p < .01$) 2. Leadership = .74 ($p < .01$) 3. Situation Monitoring = .73 ($p < .01$) 4. Mutual Support = .79 ($p < .01$) 5. Communication = .60 ($p < .01$)	Cronbach's alpha: 1. Team Structure = .89 2. Leadership = .95 3. Situation Monitoring = .91 4. Mutual Support = .90 5. Communication = .88
Patient Safety Culture Survey (PSCS)			
Source	Sample	Validity	Reliability
Sorra & Dyer (2010)	331 Hospitals 2,267 Units 50,513 Staff Hospital bed size: 6-49 beds: 124 50-199 beds: 117 200-399 beds: 62 400+ beds: 28	Validity assessment for the original HSOPS survey reported	Cronbach's alpha: Teamwork within units = .83 Supervisor/manager expectations and actions promoting patient safety = .79 Organizational learning – continuous improvement = .71 Management support for patient safety = .79 Overall perceptions of patient safety = .74 Feedback and communication about error = .78 Communication openness = .73

			Frequency of events reported = .85 Teamwork across units = .79 Staffing = .62 Handoffs and transitions = .81 Nonpunitive response to errors = .78
--	--	--	---

In addition to the psychometric testing above for the PES-NWI, two robust psychometric studies were recently conducted to evaluate the reliability of the PES-NWI for use among military nurses (Raju, Su, & Patrician, 2014; Swiger et al., 2017). Findings from these studies suggest that the PES-NWI, especially the composite score, is a reliable measure of the nursing practice environment for use among military nurses (Raju et al., 2014; Swiger et al., 2017). Both studies found that several items may be eliminated from the instrument without affecting the instrument's psychometrics and one study noted significant differences between nurse respondents by group to include acute, or inpatient, compared to ambulatory, or outpatient, environments on certain items (Swiger et al., 2017).

Single Item Measures

Staff nurse job satisfaction and staff nurse intent to leave are operationalized as single item measures previously used in multiple federally funded U.S. and international studies (Aiken et al., 2009; Kutney-Lee et al., 2015; Shang et al., 2013). These single item measures demonstrate strong reliability among military nursing samples (Breckenridge-Sproat et al., 2017; Patrician et al., 2010).

Procedures for Data Collection

In 2011, the Army Nurse Corps implemented a new framework for nursing called the Patient CaringTouch System (PCTS). Voluntary response sampling was utilized for

data collection both pre and post PCTS implementation for a program evaluation which included staff nurses' responses on measures of the nursing practice environment, staff nurse job satisfaction, and staff nurse intent to leave. Data were collected in 2010, 2011, 2013, 2014, 2016, and 2018. In 2016, the Military Health System performed a system-wide survey collecting clinic staff responses through voluntary sampling on the TeamSTEPPS Teamwork Perceptions Questionnaire (T-TPQ) and the Military Health System Patient Safety Culture Survey (MHS PSCS). These secondary data represent military and civilian government service personnel assigned to primary care clinics within Army military treatment facilities. Therefore, the 2016 Army Nurse Corps PCTS data containing staff nurse response on the PES-NWI and two single items measures of staff nurse job satisfaction and intent to leave were requested for this study. Use of these data required the submission of a Data Use Agreement Application through the Defense Health Agency Privacy and Civil Liberties Office and the Army Nurse Corps Chief's office for review and processing. Data use agreements for one limited data set and three de-identified data sets were procured and signed and these data were provided to the primary investigator by secure file transfer.

Four raw data sets were cleaned and merged using the primary care clinic name, Military Expense and Performance Reporting System code, and Defense Medical Information System Identifier. Data quality was assessed prior to aggregation of the data to the clinic level. Missing data in the Army Nurse Corps data set were addressed by deletion. Missing data followed a pattern in which all cases with missing data were missing all 31 items of the PES-NWI. There were no missing data in the T-TPQ data set. This is a surprising finding that raises questions as to whether incomplete surveys were

discarded or if methods were employed which did not allow respondents to omit responses. Missing data in the Military Health System PSCS were assessed for patterns and assumed to be missing at random. Therefore, due to high interclass correlation coefficients for each composite measure in each primary care clinic, these data were addressed by multiple imputation. This process utilized repeated estimations both minimizing standard errors and producing more reasonable estimates of standard errors (Patrician, 2002). A disadvantage of multiple imputation is the inability to replicate the results as each imputed data set will differ (Patritican, 2002).

Histograms and normal Q-Q plots were visually inspected for evidence of skewness and kurtosis. Fishers z scores were computed by dividing the skewness statistic by the skewness error which can be modelled:

$$Z = \frac{\text{Skewness statistic}}{\text{Error skewness}}$$

Similarly, z scores were computed to assess kurtosis by dividing the kurtosis statistic by the kurtosis error, modelled:

$$Z = \frac{\text{Kurtosis statistic}}{\text{Error kurtosis}}$$

Data demonstrated mild to moderate skewness and kurtosis as presented for the PES-NWI in Table 5, the T-TPQ in Table 6, and the Military Health System PSCS in Table 7. Most composites demonstrated negative, or left skewness, indicated by z-scores lower than -1.96. Positive, or right, skewness is indicated by a z-score greater than 1.96. Composites with z-scores falling between -1.96 and 1.96 are not skewed. Composites with a kurtosis z-score less than -.196 are platykurtic, or having a wide distribution, and

z-scores higher than 1.96 are leptokurtic, or having a narrow distribution. Composites with kurtosis z-scores falling between -1.96 and 1.96 are mesokurtic, or normally distributed. The primary analyses of this study utilized regression and ordinary least squares regression. Regression analysis does not make assumptions about the distributions of dependent variables or independent predictor variables (Hayes, 2018), therefore these data were not transformed to address skewness and kurtosis.

Table 5.

Practice Environment Scale of the Nursing Work Index Skewness and Kurtosis

Diagnostics

Scale	Skewness			Kurtosis		
	Statistic	SE	Z-score	Statistic	SE	Z-score
Participation	-.011	.122	-0.090	-.867	.243	-3.568
Foundations	-.318	.122	-2.607	-.366	.243	-1.506
Manager	-.622	.122	-5.098	-.476	.243	-1.959
Staffing	-.298	.122	-2.443	-.531	.243	-2.185
Relations	-1.049	.122	-8.598	.768	.243	3.160
Composite	-.237	.122	-1.943	-.498	.243	-2.049

Table 6.

TeamSTEPPS Teamwork Perceptions Questionnaire Skewness and Kurtosis Diagnostics

Scale	Skewness			Kurtosis		
	Statistic	SE	Z-score	Statistic	SE	Z-score
Team Structure	-.565	.076	-7.434	.331	.152	2.178
Leadership	-.745	.076	-9.803	.140	.152	0.921
Situation Monitoring	-.593	.076	-7.803	.725	.152	4.770
Mutual Support	-.543	.076	-7.145	.691	.152	4.546
Communication	-.597	.076	-7.855	1.271	.152	8.362

Table 7.*Military Health System Patient Safety Culture Survey Skewness and Kurtosis Diagnostics*

Scale	Skewness			Kurtosis		
	Statistic	SE	Z-score	Statistic	SE	Z-score
Teamwork within units	-.904	.098	-9.224	1.094	.196	5.497
Manager Expectations & Actions Promoting Patient Safety	-.904	.100	-9.040	.604	.199	3.035
Organizational Learning – Continuous Improvement	-.823	.102	-8.069	1.855	.204	9.093
Management Support for Patient Safety	-.853	.101	-8.446	.755	.203	3.719
Overall Perceptions of Patient Safety	-.481	.100	-4.810	.136	.200	0.680
Feedback & Communication About Error	-.447	.100	-4.470	-.123	.200	-0.615
Communication Openness	-.587	.099	-5.929	.090	.198	0.455
Frequency of Events Reported	-.627	.105	-5.971	-.262	.209	-1.254
Teamwork Across Units	-.440	.103	-4.272	.008	.205	0.039
Staffing	-.002	.102	-0.020	-.464	.204	-2.275
Handoffs & Transitions	-.060	.114	-0.526	-.489	.227	-2.154
Nonpunitive Response to Errors	-.293	.101	-2.901	-.089	.202	-0.441

Operational Definitions

Dependent variables include staff perception of overall safety, staff nurse job satisfaction, and staff nurse intent to leave. Staff perception of overall safety is operationalized as clinic staff responses on the MHS PSCS. The items on this scale are organized by domain and ask respondents to assess if each item occurs in their clinic by responding on a five point, Likert-type scale; strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree. Often results are presented as percent positive or percent per item or per composite. Negatively worded items are reverse coded so that responses of strongly disagree or disagree are scored higher. For this study, composite averages were calculated, and composite scores were evaluated as ordinal scales like the PES-NWI and T-TPQ measures to assess for linear relationships among these variables. Both staff nurse job satisfaction and intent to leave are operationalized as single item

measures previously used in multiple, federally-funded United States and international studies (Aiken et al., 2009; Breckenridge-Sproat et al., 2017; Patrician et al., 2010).

The independent variable of this study is the nursing practice environment which is operationalized as staff nurse responses on the PES-NWI (Lake, 2002). Team performance is evaluated as both an independent variable and mediating variable and is operationalized as clinic staff responses on the T-TPQ (AHRQ, 2010). Covariates identified in the literature include facility characteristics such as size, teaching status, clinic workload, staffing, and staffing skill mix. Army Medicine borrowed an executive leadership model from the Navy and developed the Army Medical Department Health Executive Leadership Organization and Structure implemented from June 2015 to December 2016 (Army Medical Department, 2015; *Army Medicine 2020 Campaign Plan*, 2013). This model standardized the leadership structure of Army medical treatment facilities as either medical centers, large community hospitals, small community hospitals, large clinics, medium clinics, or small clinics (Army Medical Department, 2015). In addition to these designations are community-based, soldier, or troop medical homes situated in military communities both on and off military installations. These designations operationalize medical treatment facility size. Data collected from the Military Health System Data Repository and Military Health System Mart from 2016 are utilized to describe nurse staffing and workload (Military Health System, 2020).

Nurse characteristics are also examined in the literature, however, the aggregation of survey data to the clinic level for this analysis prevents the inclusion of these variables as covariates. Patient characteristics will not be analyzed in this study. Covariates

included in statistical analyses were determined by preliminary correlation analyses.

Study variable name, type, and empirical indicators are detailed in Table 8.

Table 8.

Study Variable Name, Type, and Empirical Indicators

Variable Name	Variable Type	Empirical Indicator
Dependent Variables		
Staff nurse intent to leave	Categorical, ordinal	Single item measure: “If you could, regardless of military obligation (yours or your spouses), would you leave your current position?” 1. No, I’m staying because I want to 2. Yes, within 3 months 3. Yes, within 6 months 4. Yes, within 1 year
Staff nurse job satisfaction	Categorical, ordinal	Single item measure: “Overall, how satisfied are you with your current job?” 1. Dissatisfied 2. Somewhat dissatisfied 3. Somewhat satisfied 4. Very satisfied
Staff perception of overall safety	Categorical, ordinal	Staff responses on the Military Health System Patient Safety Culture Survey
Independent Variables		
Nursing practice environment	Continuous	Staff nurse (RN and LPN) responses on the Practice Environment Scale of the Nursing Work Index
Team Performance	Continuous	Staff responses on the TeamSTEPPS Teamwork Perceptions Questionnaire
Potential Covariates		
Medical treatment facility characteristics: • Size	Categorical, ordinal	1. Community Based Medical Home 2. Small Clinic 3. Medium Clinic 4. Large Clinic 5. Small Hospital 6. Large Hospital 7. Medical Center
• Regional Health Command	Categorical, nominal	A, B, C, & D
• Regional Medical Command	Categorical, nominal	1, 2, 3, 4 & 5
	Continuous	Available RN FTEs

• Workload	Continuous	Available LPN FTEs
	Continuous, ratio	Total Nurse Available FTEs to 1000 patient encounters
	Continuous, ratio	RN Avail FTEs to 1000 patient encounters
• Staffing	Continuous, ratio	LPN Available FTEs to 1000 patient encounters
	Continuous	Assigned RN FTEs
	Continuous	Assigned LPN FTEs

Note. RN- registered nurse; LPN- licensed practical nurse; FTE- full time equivalent

Chapter Four

The purpose of this study was to examine the relationship among nursing practice environments, team performance, clinic staff perception of overall patient safety, staff nurse job satisfaction, and staff nurse intent to leave in US Army primary care clinics. Secondary data collected by the Army Nurse Corps and the Military Health System in 2016 contained matched data representing thirty-nine Army primary care clinics. These data contain staff nurse responses on the (a) Practice Environment Scale of the Nursing Work Index (PES-NWI), (b) a single item measure of staff nurse job satisfaction, (c) a single item measure of staff nurse intent to leave, (d) clinic staff responses on the TeamSTEPPS Teamwork Perceptions Questionnaire (T-TPQ), and (e) clinic staff responses on the Military Health System Patient Safety Culture Survey (PSCS). The results of this study are presented in this chapter.

Sample Description

Secondary data from 2016 were requested from the Army Nurse Corps Chief's office and the Defense Health Agency Patient Safety and Analytics and Evaluations Directorates. Data quality and normality were assessed using histograms and normal Q-Q plots. Intraclass correlation coefficients (ICCs) were estimated using a one-way, random effects model at a 95% confidence interval for the mean of k raters. ICC (1, k) for the thirty-nine clinics on the PES-NWI ranged from .76 - .98, on the T-TPQ from .84-.99, and on the Military Health System PSCS from .63-.98. Reliability coefficients are interpreted as poor ($< .50$), moderate (.50-.75), good (.75-.90), and excellent ($> .90$) (Koo & Li, 2016). Clinic scores on the PES-NWI, T-TPQ, and PSCS were moderate to excellent, therefore, individual responses were aggregated to the clinic level and matched

by Defense Medical Information System Identifier and Medical Expense/Performance Reporting System codes with clinic command, staffing, and workload data. Individual responses on the single item measures for patient safety grade, number of events reported, staff nurse job satisfaction and staff nurse intent to leave were averaged. Clinic means were compared to the frequencies and proportions of individual responses per clinic. Means comparable to the mode and median of individual responses were considered representative and retained for analysis at the clinic level.

Studies examining the nursing practice environment in acute, or inpatient, care settings included hospitals having at least ten nurse respondents (Aiken et al., 2002; Aiken et al., 2009). Unit-level analyses of the nursing practice environment in acute, or inpatient, care settings to include military medical-surgical care settings have examined units with as few as five nurse respondents (Breckenridge-Sproat et al., 2012; Swiger et al., 2018; Van Bogaert et al., 2014). Nurse staffing in US Army primary care clinics is based on The Joint Commission Primary Care Medical Home team nursing model which includes one team or treatment RN per provider and three nursing support staff: LPN, medic, or certified nursing assistant (U.S. Army Medical Command, 2014b). Smaller clinics and community-based medical homes may staff fewer than five nurses. A clinic was included if (a) at least three nurses, one of which must be a RN, completed the entire PES-NWI survey, at least three clinic staff completed the T-TPQ and PSCS, (c) the ICCs suggest moderate to excellent interrater reliability, and (d) data were available for military treatment facility characteristics to include command, military treatment facility size, staffing, and workload. The sufficiency of as few as three nurse respondents is

supported by the literature (Hanrahan, 2007; Lake et al., 2016; Lake, Staiger, Edwards, Smith, & Rogowski, 2018)

A power analysis performed using Raosoft calculating software recommended a minimum sample size of sixty-one clinics. Another power analysis using the G Power calculating software recommended a minimum sample size of forty-four clinics. Initial cleaning and data quality analysis resulted in matched data representing thirty-nine Army primary care clinics. The confidence level for this study was set at 95% to ensure control for type I error.

Statistical Description of the Variables

Dependent Variables

Staff Perception of Overall Patient Safety. Military Health System PSCS survey scores were evaluated for missing data. Missing data on the PSCS were assumed to be missing at random and pattern analysis suggested item non-response. Multiple imputation was used to estimate values from random samples of imputed data sets (Patrician et al., 2002; Rubin & Rubin, 2009; von Hippel, 2018). A two-stage pilot analysis was used to estimate the appropriate number of imputations using 5 imputations and then 15 imputations and 10 imputations were determined to be the best number for replicating similar standard errors (von Hippel, 2018). Visual inspection of histograms and Q-Q plots suggested approximately symmetric normal distributions which were not extremely skewed. Skewness and Kurtosis were estimated using Fisher's skewness coefficient, or z score, which suggested moderate negative skewness and a mildly leptokurtic curve. Descriptive statistics for the dimensions of clinic staff perceptions of overall patient safety are presented in Table 9.

Table 9.

Descriptive Statistics for the Dimensions of Clinic Staff Perception of Overall Patient

Safety

Variable	Mean	SD
Teamwork Within Units	3.73	.529
Manager Expectations & Actions Promoting Patient Safety	3.79	.506
Organizational Learning – Continuous Improvement	3.69	.372
Management Support for Patient Safety	3.84	.439
Overall Perceptions of Patient Safety	3.61	.413
Feedback & Communication About Error	3.58	.497
Communication Openness	3.61	.460
Frequency of Events Reported	3.87	.463
Teamwork Across Units	3.56	.445
Staffing	3.19	.429
Handoffs & Transitions	3.60	.470
Nonpunitive Response to Errors	3.37	.525

Two additional dimensions of patient safety include the patient safety grade and number of events reported. These dimensions are operationalized as single-item, Likert-type measures. Patient safety grade is the clinic grade on patient safety as one of five options to include “excellent”, “very good”, “acceptable”, “poor”, or “failing” (AHRQ, 2016). Coding for this item was 1-5, respectively. Number of events reported is the number of events a respondent reported in the last twelve months on a six item scale including “no events reported”, “1 to 2 event reports”, “3 to 5 event reports”, “6 to 10 event reports”, “11 to 20 event reports”, and “21 event reports or more” (AHRQ, 2016). This item was coded 1-6, respectively. These variables were evaluated as ordinal scale variables. (Chyung, Roberts, Swanson, & Hankinson, 2017; Norman, 2010; Sullivan & Artino, 2013). Descriptive statistics for individual responses across US Army Primary

Care clinics for patient safety grade and number of events reported are presented in Table 10.

Table 10.

Descriptive Statistics for Patient Safety Grade and Number of Events Reported

Dimension	Response	Frequency	Proportion (%)	Combined (%)
Patient Safety Grade	Failing	6	.9	Negative – 4.7%
	Poor	26	3.8	
	Acceptable	125	18.1	Neutral
	Very Good	337	48.8	Positive – 75.9%
	Excellent	187	27.1	
	Missing	9	1.3	
Number of Events Reported	No event reports	374	54.2	
	1-2 reports	188	27.2	
	3-5 reports	70	10.1	
	6-10 reports	15	2.2	
	11-20 reports	8	1.2	
	21+ reports	5	.7	
	Missing	30	4.3	

Job Satisfaction. Job satisfaction was operationalized as a single-item, four-response measure previously used in federally funded research. The four-response item, or forced Likert-type, requires nurse respondents to decide whether they are very dissatisfied, somewhat dissatisfied, somewhat satisfied, or very satisfied without a neutral response option (Leung, 2011). Eighty-three percent of staff nurse respondents reported being somewhat or very satisfied with their current job. The descriptives for individual staff nurse responses for job satisfaction are presented in Table 11.

Table 11.*Descriptive Statistics for US Army Primary Care Staff Nurse Job Satisfaction*

Statistic	Satisfied		Dissatisfied	
	Very	Somewhat	Somewhat	Very
Frequency	209	213	60	24
Proportion (%)	41.3	42.1	11.9	4.7

The most common methodology for analysis of this single item measure across the literature is to dichotomize the responses as either dissatisfied or satisfied and analyze as a binomial categorical variable. This study employs a more granular approach. The use of Likert-type items as ordinal scales is controversial, especially for Likert-type items having less than five response options (Carifio & Perla, 2008; Chyung et al., 2017; Leung, 2011; Norman, 2010; Sullivan & Artino, 2013). However, the literature suggests that due to the robust nature of parametric statistical tests, utilizing a four-response, Likert-type measure as an ordinal scale will produce minimal difference in distribution means (Norman, 2010; Sullivan & Artino, 2013). Furthermore, correlation and regression focus on the variation of a distribution rather than the measures of central tendency, namely the mean, which may be affected by the inclusion of a neutral response (Chyung et al., 2017; Cronbach, 1957, 1975; Norman, 2010).

Intent to Leave. Intent to leave was operationalized as a single-item, four-response forced Likert-type measure also used extensively in prior federally funded research studies (Leung, 2011). The options for response include a single response for no intent to leave which reads “no, I am staying because I want to”, and three items measuring the urgency of intent to leave to include “yes, within 1 year”, “yes, within 6

months”, and “yes, within 3 months”. The descriptive statistics for staff nurse intent to leave are presented in Table 12.

Table 12.

Descriptive Statistics for US Army Primary Care Staff Nurse Intent to Leave

Statistic	No intent to leave	Yes, within 1 year	Yes, within 6 months	Yes, within 3 months
Frequency	334	101	20	50
Proportion (%)	66	20	4	10

As with the single-item measure for job satisfaction, the methodology common across the literature for analysis of this single-item measure is to dichotomize responses as either no intent to leave or intent to leave. However, dichotomizing ordinal variables may lead to a reduction in statistical power (Norman, 2010). The design of the responses on this single-item measure implies an anchoring zero, or no intent to leave, and increasing urgency of intent to leave. Therefore, this single-item, ordinal measure was analyzed as an ordinal scale and recoded numerically from 0-3, respectively.

Independent Variables

Nursing Practice Environment. Average scores greater than or equal to 2.5 on four or five subscales indicate a favorable nursing practice environment, 2.5 or higher on two or three subscales indicate a mixed environment, and one or no subscale averages equal to or greater than 2.5 is indicative of an unfavorable nursing practice environment (Lake & Friese, 2006). US Army primary care nurses perceived a favorable nursing practice environment in thirty of the thirty-nine (74.1%) clinics. Nurses reported mixed nursing practice environments for six clinics (17.9%) and unfavorable nursing practice environments for three clinics (8%). Missing data on the PES-NWI did not appear to be

missing at random. Incomplete surveys were missing all thirty-one items of the PES-NWI. Therefore, only complete PES-NWI surveys were retained and aggregated to the clinic level. Descriptive statistics for the PES-NWI composite and five subscale measures are presented in Table 13.

Table 13.

Descriptive Statistics for the Domains of the Nursing Practice Environment

Variable	Mean	SD	Tolerance	VIF
Participation in Hospital Affairs	2.66	.424	.125	7.993
Foundations for Quality Care	2.94	.334	.172	5.813
Nurse Manager Ability	3.02	.526	.203	4.920
Staffing & Resource Adequacy	2.79	.440	.370	2.705
Nurse Physician Collegial Relations	3.38	.351	.511	1.956
Composite	2.96	.363	-	-

Data were assessed for compliance with the assumptions for regression analysis to include linearity, homoscedasticity, and independence. Independent variables were assessed for multicollinearity using tolerance and variance inflation factor (VIF) measures. A tolerance value less than 0.10 and/or a VIF greater than one suggests collinearity, and a VIF greater than five suggests high collinearity (Daoud, 2017). The tolerance for each variable was greater than 0.10, however, the VIF for three subscales were equal to or greater than five suggesting multicollinearity, or near-linear dependence (Daoud, 2017). Moreover, multiple eigenvalues close to zero with high variance decomposition proportions for these subscales suggests multicollinearity. It is likely that

these subscales contain information belonging to one or the other subscales.

Theoretically, the subscale may be measuring information pertaining to multiple dimensions of the nursing practice environment. Methods to address collinearity and multicollinearity include removing variables or combining variables. The subscales are averaged in the composite score of the PES-NWI which was utilized for multiple regression. The PES-NWI subscales were entered into forward inclusion models with covariates to estimate the best predictive models for each outcome variable. The forward inclusion automated regression modeling procedure adds the best single predictor to the model first and only adds subsequent predictors to the model if the R^2 is significant, the R^2 is significantly higher than the previous model with the best single predictor, and if subsequent predictors demonstrate the highest semi partial correlation with the dependent variable while controlling for the predictors already included.

Team Performance. Clinic staff perceived high team performance across US Army primary care clinics. Each T-TPQ survey was complete and retained for analysis. It is rare to have survey data without missing responses or items. This raises questions as to why these data are complete and whether incomplete surveys were retained or if measures were implemented to prevent incomplete responses. Higher scores on each composite indicate a more positive impression of the dimension. Average scores across US Army primary care clinics for the dimensions of the T-TPQ are presented in Table 14.

Table 14.*Descriptive Statistics for the Dimensions of Team Performance*

Variable	Mean	SD	Tolerance	VIF
Team Structure	3.73	.272	.336	2.974
Leadership	3.68	.397	.297	3.372
Situation Monitoring	3.74	.274	.123	8.117
Mutual Support	3.81	.297	.174	5.750
Communication	4.04	.223	.328	3.044

Note. VIF = variance inflation factor

There are two methods for scoring the T-TPQ (Agency for Healthcare Research and Quality, 2010). For this study, an average was computed for each domain. ICCs (1, k) for each clinic demonstrated reliability of the mean measures for analysis of linear relationships with other study variables at the clinic level. T-TPQ data were assessed for compliance with the assumptions for regression analysis. Independent variables were assessed for multicollinearity using tolerance and variance inflation factor (VIF) measures. The tolerance for each variable was greater than 0.10. The VIF for two composites were equal to or greater than five suggesting collinearity (Daoud, 2017). High variance decomposition proportions were observed for two dimensions: situation monitoring and mutual support. As with the PES-NWI subscales, these composite measures may be measuring the same information. Unfortunately, the T-TPQ is designed as five composite measures, therefore, combining situation monitoring and mutual support composites does not make sense conceptually. Therefore, forward inclusion automated regression modeling was used to estimate the best predictive models of each outcome including each composite measure of the T-TPQ demonstrating statistically significant bivariate relationships with each outcome.

Covariates. Pearson correlation and ANOVA were used to examine the bivariate relationships among military treatment facility and clinic demographic variables with the dependent variables: clinic staff perception of overall safety, staff nurse job satisfaction, and staff nurse intent to leave. Significant correlations are presented in Table 15.

Table 15.

Covariate Correlations with Dependent Variables

Dependent Variable	Covariate	Pearson (r)	Significance (p)
Frequency of Events Reported	RN hours per 1000 patient encounters	.358	.025
Teamwork across units	LPN assigned FTEs	-.348	.030
Handoffs and transitions	LPN assigned FTEs	-.340	.034
Nonpunitive response to error	LPN assigned FTEs	-.376	.018
	RN assigned FTEs	-.343	.033
Staffing	Nurse hours per 1000 patient encounters	.380	.017
	LPN hours per 1000 patient encounters	.353	.027
Job satisfaction	RN assigned FTEs	-.359	.025
Intent to leave	RN assigned FTEs	.466	.003

Note. RN = registered nurse; LPN = licensed practical nurse; FTE = full time equivalent

A one-way analysis of variance (ANOVA) test was used to estimate the bivariate relationships between military treatment facility size, Regional Health Command, and Regional Medical Command and the dependent variables. Data were examined for compliance with the assumptions for ANOVA. Several outcome variables to include patient safety grade, number of events reported, teamwork across units, and staffing violated the assumption of homogeneity of variance measured by Levene's test and a

Welch ANOVA was used to address heterogeneity (Shieh & Jan, 2015). No statistically significant differences were identified among US Army primary care clinics based on military treatment facility size, Regional Health Command, or Regional Medical Command.

Psychometric Properties of Instruments

Instrument reliability was assessed by internal consistency. A reliability coefficient, or Cronbach's alpha, greater than .60 demonstrates acceptable reliability and greater than .80 is exceptional (Ursachi, 2015). Alpha reliability coefficients for the PES-NWI, T-TPQ, and Military Health System PSCS are presented in Table 16. The staffing composite of the Military Health System PSCS demonstrated the lowest reliability ($\alpha = .61$). Cronbach alphas are typically lower for scales with fewer items. The staffing measure of the PSCS is a four-item composite scale. Additionally, three of the four items on this scale are negatively worded which may threaten the reliability of the measure (Chyung et al., 2018). The lower reliability may also be due to differences among specialties. For example, a doctor may have a difference in opinion compared to a nurse practitioner, RN, LPN, medic, certified nursing assistant, or administrative clinic personnel concerning staffing.

Table 16.

Alpha Coefficients for Study Instruments

Instrument	Subscale/Composite	Cronbach's Alpha
Practice Environment Scale of the Nursing Work Index (PES-NWI)	Composite	.96
	Nurse Participation	.91
	Nursing Foundations	.87
	Nurse Manager	.89
	Staffing & Resource	.76
	Nurse Physician Relations	.84

TeamSTEPPS Teamwork Perceptions Questionnaire (T-TPQ)	Team Structure	.92
	Leadership	.94
	Situation Monitoring	.92
	Mutual Support	.96
	Communication	.93
Military Health System Patient Safety Culture Survey (PSCS)	Teamwork Within Units	.86
	Manager Expectations	.86
	Organizational Learning	.75
	Management Support	.82
	Overall Perceptions	.75
	Feedback and Comm.	.83
	Communication Openness	.78
	Frequency Events Reported	.89
	Teamwork Across Units	.83
	Staffing	.61
	Handoffs and Transitions	.82
	Nonpunitive Response	.81

Note. Comm. – communication

Results of Hypothesis Testing

Hypotheses 1-2 were tested using Pearson correlation and linear regression analyses using IBM Statistical Package for the Social Sciences (SPSS) version 27. A two-tailed test of significance at .05 was used for testing all hypotheses. Simple linear regression models estimated the linear relationships among the nursing practice environment, team performance, clinic staff perception of overall patient safety, staff nurse job satisfaction, and staff nurse intent to leave. Multiple linear regression models estimated how well the nursing practice environment, operationalized as the composite PES-NWI, explains the variation of the dependent variables controlling for covariates. Three subscales of the PES-NWI and two composite measures of the T-TPQ violated the assumption of no collinearity between independent variables, therefore, forward inclusion regression models estimated the effect of the individual dimensions of the nursing practice environment and team performance on clinic staff perception of overall patient

safety, staff nurse job satisfaction, and staff nurse intent to leave controlling. The use of forward regression, and stepwise methods in general, as a response to collinearity has been criticized; however, other methods to include ridge regression and principal components regression are also controversial (Dormann et al., 2013; Fox, 2011). Multicollinearity and collinearity cannot be solved within the scope of this study (Dormann et al., 2013). Forward selection modeling was utilized to preserve the observed values and determine the dimensions of the nursing practice environment and team performance most associated with clinic staff nurse perception of overall patient safety, staff nurse job satisfaction, and staff nurse intent to leave.

Hypothesis 3 was tested using the PROCESS macro for IBM SPSS version 3.5 (Hayes, 2018). PROCESS is a tool for conducting conditional process, mediation, and moderation analyses using ordinary least squares regression (Hayes, 2018). This analysis was complicated by the multicollinearity and collinearity identified among independent variable measures and the results should be evaluated with prudence. Simple mediation models were run to examine hypotheses 3a-3c using PROCESS Model 4 with 10,000 bootstrap samples.

Hypothesis 1

Hypothesis one stated US Army primary care clinic nursing practice environments, operationalized as staff nurse responses on the PES-NWI, will be (a) positively associated with team performance, (b) positively associated with staff nurse job satisfaction, (c) positively associated with staff perception of overall safety, and (d) negatively associated with staff nurse intent to leave.

Hypothesis 1a. Pearson correlation was utilized to examine the relationship between the nursing practice environment and the dimensions of team performance. The PES-NWI composite measure was not correlated with the T-TPQ. The nurse participation in hospital affairs dimension of the nursing practice environment was significantly correlated with both team structure ($r = .342, p = .004$) and leadership ($r = .317, p = .050$). Nursing foundation for quality care was significantly correlated with team structure ($r = .317, p = .050$). The nurse manager dimension was significantly correlated with leadership ($r = .317, p = .049$). Bivariate relationships among the dimensions of team performance with demographic military treatment facility and clinic variables were estimated using Pearson correlation and ANOVA. The leadership dimension of team performance was correlated with LPN hours to 1000 patient encounters ($r = -.392, p = .014$). No other statistically significant bivariate relationships were found.

Forward inclusions models were used to estimate the dimensions of the nursing practice environment having the greatest effect on the team structure and leadership dimensions of team performance. Nurse participation in hospital affairs was the single greatest predictor of both team structure ($\beta = .209, t(37) = 2.087, p = .044$) and leadership ($\beta = .327, t(37) = 2.259, p = .030$). Models are summarized in Table 17. These findings are a weak support for hypothesis 1a.

Table 17.*Nursing Practice Environment Effect on Composite Measures of Team Performance*

Variable	Team Structure			Leadership		
	β	$t(37)$	P	B	$t(37)$	P
Constant	3.179	11.814	< .001	2.811	7.222	< .001
Nurse Participation	.209	2.087	.044	.327	2.259	.030
R ²	.105			.121		
F	(1, 37) = 4.355			(1, 37) = 5.102		
Sig.	.044			.030		

Hypothesis 1b. Pearson correlation was utilized to examine the bivariate relationships between the nursing practice environment and staff nurse job satisfaction. The PES-NWI composite and each subscale were positively correlated with staff nurse job satisfaction. Correlations are presented in Table 18. Pearson correlation and ANOVA were used to estimate bivariate relationships between staff nurse job satisfaction and military treatment facility and clinics demographic characteristics and a statistically significant relationship was found between staff nurse job satisfaction and RN assigned FTEs ($r = -.359$, $p = .025$).

Table 18.*Bivariate Relationships Between the Nursing Practice Environment and Staff Nurse Job Satisfaction*

Statistic	Composite	Participation	Foundation	Manager	Staffing	Relations
r	.758	.749	.678	.740	.665	.428
p	< .001	< .001	< .001	< .001	< .001	.007

A simple linear regression model estimated that the PES-NWI composite had a statistically significant effect on staff nurse job satisfaction ($F(1, 37) = 48.694$, $p < .001$)

explaining almost fifty-seven percent of the variance in staff nurse job satisfaction ($R^2 = .568$). This effect remained significant controlling for RN assigned FTEs ($F(2, 36) = 24.399, p < .001$) in a multiple regression model with a R^2 of .394. Staff nurse job satisfaction increased ($\beta = .673, t(36) = 6.155, p < .001$) for every unit increase in perception of the nursing practice environment and decreased ($\beta = -.004, t(36) = -.783, p = .439$) for each fewer man hour (168 hours) represented by an RN on the clinic's staffing document.

A forward inclusion model was used to estimate the dimensions of the nursing practice environment having the greatest effect on staff nurse job satisfaction. Nurse participation in hospital affairs had the single, greatest effect on staff nurse job satisfaction. A statistically significant equation was found ($F(1, 37) = 47.172, p < .001$), with an R^2 of .560. These findings support hypothesis 1b.

Hypothesis 1c. Pearson correlation was utilized to examine the bivariate relationships between the nursing practice environment and the dimensions of clinic staff overall perception of patient safety. Several statistically significant bivariate relationships were found. These correlations are presented in Table 19. The negative correlations between the nursing practice environment and patient safety grade indicate that positive nursing practice environments (higher scores) are correlated with higher patient safety grades (lower scores).

Table 19.*Correlations Between the Nursing Practice Environment and the Dimensions of Clinic**Staff Perception of Overall Patient Safety*

Overall Patient Safety		Composite	Participation	Foundation	Manger	Staffing	Relations
Safety Grade	r	-.391*	-.394*	-.449**	-.347*	-.318*	-.212
	p	.014	.013	.004	.030	.048	.194
Event Reports	r	.188	.205	.134	.250	.067	.150
	p	.251	.211	.416	.125	.684	.363
Teamwork Within	r	.398*	.346*	.349*	.418**	.296	.327*
	p	.012	.031	.029	.008	.067	.042
Mgr. Expectations	r	.499**	.466**	.380*	.550**	.449**	.287
	p	.001	.003	.017	< .001	.004	.077
Org. Learning	r	.467**	.420**	.343*	.544**	.333*	.367*
	p	.003	.008	.033	< .001	.039	.021
Management Support	r	.529**	.522**	.490**	.575**	.396*	.301
	p	.001	.001	.002	< .001	.013	.062
Overall Perception	r	.295	.207	.284	.348*	.258	.101
	p	.068	.097	.080	.030	.113	.539
Feedback and Comm.	r	.454**	.433**	.350*	.467**	.453*	.243
	p	.004	.006	.029	.003	.004	.136
Communication	r	.508**	.489**	.459**	.529**	.401*	.323*
	p	.001	.002	.003	.001	.011	.045
Freq. Event Reports	r	.358*	.335*	.413**	.358*	.366*	.072
	p	.025	.037	.009	.025	.022	.661
Teamwork Across	r	.476**	.476**	.435**	.521**	.358*	.315
	p	.002	.002	.006	.001	.025	.051
Staffing	r	.206	.100	.151	.223	.287	.118
	p	.208	.546	.358	.173	.076	.475
Handoff & Transition	r	.336*	.338*	.301	.371*	.309	.116
	p	.036	.036	.063	.020	.056	.481
Nonpunitive response	r	.369*	.346*	.292	.447**	.281	.209
	p	.021	.031	.072	.004	.083	.201

Note: Mgr. – manager, Org. – organization, Freq. – frequency.

* $p < .05$, ** $p < .001$

Simple linear regression models estimated the effect of the PES-NWI composite score on the dimensions of clinic staff perception of overall patient safety. The PES-NWI composite had a statistically significant effect on each dimension of clinic staff perception of overall patient safety excluding the number of events reported, overall

perceptions of patient safety, and staffing dimensions. These models are summarized in Table 20.

Table 20.

Effects of the Nursing Practice Environment on the Dimensions of Clinic Staff Perception of Overall Patient Safety

Outcome	Model Summary			Coefficient	
	R ²	F (1, 37)	P	β	<i>t</i> (37)
Patient safety grade	.153	6.664	.014	-.447	-2.581
Events reported	-	-	-	-	-
Teamwork within units	.159	6.983	.012	.581	2.643
Manager expectations	.249	12.286	.001	.696	3.505
Organizational learning	.218	10.299	.003	.478	3.209
Management support	.280	14.397	.001	.639	3.794
Overall perceptions	-	-	-	-	-
Feedback and communication	.206	9.617	.004	.621	3.101
Communication openness	.258	12.897	.001	.644	3.591
Frequency of event reports	.128	5.438	.025	.457	2.332
Teamwork across units	.237	11.488	.002	.596	3.389
Staffing	-	-	-	-	-
Handoffs & transitions	.113	4.717	.036	.435	2.172
Nonpunitive response	.136	5.846	.021	.534	2.418

Note. Cells marked with a hyphen were not evaluated as these variables did not demonstrate a statistically significant bivariate relationship.

Multiple linear regression models were used to estimate the effect of the nursing practice environment on the dimensions of clinic staff perception of overall patient safety controlling for covariates. The PES-NWI remained a statistically significant predictor of frequency of events reported ($\beta = .389$, $t(36) = 2.036$, $p = .049$) controlling for RN hours per 1000 patient encounters ($\beta = .285$, $t(36) = 2.038$, $p = .049$). The effect of the nursing practice environment on teamwork across units ($\beta = .507$, $t(36) = 2.656$, $p = .012$) remained significant controlling for LPN assigned FTEs. The effect of the nursing practice environment on handoffs and transitions was no longer significant controlling for

LPN assigned FTEs. The effect of the PES-NWI composite score on nonpunitive response to error did not remain significant controlling for LPN and RN assigned FTEs.

Forward inclusion models were used to estimate the dimensions of the nursing practice environment having the greatest effect on the dimensions of clinic staff perception of overall patient safety. Nursing foundations for quality care had the single greatest effect on patient safety grade and frequency of events reported. Nurse manager ability, leadership, and support for nurses had the single greatest effect on teamwork within units, manager expectations and actions promoting safety, organizational learning, management support for patient safety, feedback and communication about error, communication openness, teamwork across units, handoffs and transitions, and nonpunitive response to error. Forward inclusion models are summarized in Table 21. These findings partially support hypothesis 1c.

Table 21.

Effect of Nursing Practice Environment Domains on Overall Patient Safety Dimensions

Nursing Practice Environment	Staff Perception of Overall Patient Safety	Model Summary			Coefficients	
		R ²	F (1, 37)	p	B	t (37)
Nursing Foundations	Patient Safety Grade	.202	9.348	.004	-.558	-3.057
	Freq. events reported	.171	7.622	.009	.573	2.761
Nurse manager, ability, leadership, and support for nurses	Teamwork within	.175	7.826	.008	.429	2.798
	Manager expectations	.303	16.048	< .001	.540	4.006
	Org. learning	.296	15.543	< .001	.392	3.942
	Management support	.331	18.303	< .001	.489	4.278
	Feedback and comm.	.218	10.300	.003	.449	3.209
	Communication	.279	14.344	.001	.472	3.787
	Teamwork across	.271	13.756	.001	.449	3.709
	Handoffs & transition	.138	5.920	.020	.338	2.433
	Nonpunitive response	.200	9.264	.004	.455	3.044

Note. Freq. = frequency, org. = organization, comm. = communication.

Hypothesis 1d. Pearson correlation was used to examine the bivariate relationships between the nursing practice environment and staff nurse intent to leave. The PES-NWI composite score and each subscale were negatively correlated with staff nurse intent to leave. Correlations are presented in Table 22.

Table 22.

Correlations Between the Nursing Practice Environment and Staff Nurse Intent to Leave

Statistic	Composite	Participation	Foundation	Nurse Manager	Staffing and Resource	Relations
r	-.622	-.475	-.465	-.560	-.529	-.421
p	< .001	.002	.003	<.001	.001	.008

Pearson correlation and ANOVA were used to evaluate the bivariate relationships between staff nurse intent to leave and military treatment facility and clinic demographic characteristics and a statistically significant correlation was identified between staff nurse intent to leave and RN assigned FTEs ($r = .466$, $p = .003$). A simple linear regression model was used to estimate the effect of the PES-NWI composite score on staff nurse intent to leave. The PES-NWI composite score had a statistically significant effect on staff nurse intent to leave ($\beta = -.601$, $t(37) = -4.142$, $p < .001$) explaining almost thirty-two percent of the variance ($R^2 = .317$). This association remained significant ($\beta = -.483$, $t(36) = -3.234$, $p = .003$) controlling for the number of RN assigned FTEs ($\beta = .016$, $t(36) = 2.135$, $p = .040$). Staff nurse intent to leave decreased for every unit increase in perception of the nursing practice environment and increased for every 168 hours represented by a RN on the clinic's staffing document.

A forward inclusion model was used to estimate the dimensions of the nursing practice environment having the greatest effect on staff nurse intent to leave. Nurse manager ability, leadership, and support for nurses was had the single greatest effect on staff nurse intent to leave ($\beta = -.421$, $t(37) = -4.108$, $p < .001$). The ability, leadership, and support for nurses of the nurse manager explained thirty-one percent ($R^2 = .313$) of the variance in staff nurse intent to leave. These findings support hypothesis 1d.

Hypothesis 2

Hypothesis two stated US Army primary care clinic team performance, operationalized as clinic staff responses on the T-TPQ, will be (a) positively associated with staff perception of overall safety, (b) positively associated with staff nurses' job satisfaction, and (c) negatively associated with staff nurses' intent to leave.

Hypothesis 2a. Pearson correlation was used to estimate the bivariate relationships between the dimensions of team performance and the dimensions of clinic staff perception of overall patient safety. Correlations are presented in Table 23. Pearson correlation and ANOVA were used to estimate the bivariate relationships between the dimensions of clinic staff perception of overall patient safety and military treatment facility and clinic demographic characteristics. Statistically significant relationships were identified and detailed under hypothesis 1b. Correlations were presented in Table 19 on page sixty-seven.

Table 23.

Correlations Between the Dimensions of Team Performance and the Dimensions of Clinic Staff Perception of Overall Patient Safety

Patient Safety Dimension	Statistic	T-TPQ Dimension				
		Structure	Leadership	Monitoring	Support	Communication
Patient safety grade	r	-.070	-.118	-.175	-.202	.078
	p	.671	.475	.288	.218	.638
Number of events reported	r	-.029	.137	.165	.192	.019
	p	.863	.405	.314	.242	.910
Teamwork within units	r	.135	.247	.269	.274	-.048
	p	.412	.129	.097	.091	.771
Manager expectations & actions	r	.375*	.354*	.399*	.306	.140
	p	.019	.027	.012	.058	.395
Organizational learning	r	.201	.311	.347*	.254	.024
	p	.220	.054	.030	.119	.886
Management support	r	.262	.221	.216	.205	.107
	p	.108	.175	.186	.210	.515
Overall perceptions	r	.173	.153	.244	.214	.090
	p	.292	.351	.135	.191	.585
Feedback and communication	r	.232	.231	.285	.217	-.107
	p	.156	.157	.079	.184	.515
Communication openness	r	.310	.366*	.384*	.300	.033
	p	.055	.022	.016	.063	.843
Frequency of events reported	r	.331*	.199	.225	.255	.258
	p	.039	.225	.169	.117	.112
Teamwork across units	r	.118	.265	.202	.178	-.128
	p	.475	.104	.218	.277	.438
Staffing	r	.231	.170	.322*	.228	.253
	p	.158	.301	.046	.163	.120
Handoffs and transitions	r	.147	.221	.224	.207	-.060
	p	.372	.177	.171	.205	.715
Nonpunitive response to error	r	.435**	.508**	.502**	.462**	.299
	p	.006	.001	.001	.003	.065

Note. T-TPQ = TeamSTEPPS Team Performance Questionnaire

*p < .05, **p < .01

Simple linear regression models were used to estimate the effects of the dimensions of team performance on the dimensions of clinic staff perception of overall patient safety. Simple regression models are summarized in Table 24.

Table 24.*Simple Effect of Team Performance Dimensions on Overall Patient Safety Dimensions*

Dimension		Model Summary			Parameter Estimates	
		R ²	F (1, 37)	P	β	t (37)
Team Structure	Manager expectations	.141	6.063	.019	.698	2.462
	Frequency event reports	.110	4.558	.039	.564	2.135
	Nonpunitive response	.189	8.617	.006	.837	2.935
Leadership	Manager expectation	.125	5.295	.027	.451	2.301
	Communication	.134	5.735	.022	.424	2.395
	Nonpunitive response	.258	12.847	.001	.670	3.584
Situation Monitoring	Manager expectations	.159	7.006	.012	.739	2.647
	Organizational learning	.120	5.068	.030	.472	2.251
	Communication	.384	6.387	.016	.646	2.527
	Nonpunitive response	.252	12.436	.001	.962	3.527
Mutual Support	Nonpunitive response	.214	10.062	.003	.818	3.172

A multiple linear regression model estimated the effect of team structure on frequency of events reported controlling for RN hours per 1000 patient encounters. Both team structure ($\beta = .530$, $t(36) = 2.118$, $p = .041$) and the number of RN hours per 1000 patient encounters ($\beta = .137$, $t(36) = 2.314$, $p = .026$) had a significant effect on the frequency of patient safety events reported. Simple and multiple regression models are detailed in Table 25.

Table 25.*Effects of Team Structure on Frequency of Patient Safety Events Reported*

Variables	Simple Regression			Multiple Regression		
	β	t (36)	p	β	t (37)	P
Constant	1.770	1.791	.082	1.483	1.573	.124
Team Structure	.564	2.135	.039	.530	2.118	.041
RN hours	-	-	-	.137	2.314	.026
R ²	.110			.225		
F	4.558			5.225		
Significance	.039			.010		

Forward inclusion modelling was used estimate the dimensions of team performance having the greatest effect on the dimensions of clinic staff perception of overall patient safety. The leadership dimension of team performance had the single greatest effect on nonpunitive response to error. Situation monitoring had the single greatest effect on communication openness and manager expectations and actions promoting patient safety. Forward inclusion models are summarized in Table. 26. These findings partially support hypothesis 2a.

Table 26.

Forward Effect of Team Performance Dimensions on Overall Patient Safety Dimensions

Team Performance	Clinic Staff Perception of Patient Safety	Model Summary			Coefficients	
		R ²	F (1, 37)	P	B	t (37)
Leadership	Nonpunitive response	.258	12.847	.001	.670	3.584
Situation	Communication	.588	52.806	< .001	.626	7.267
Monitoring	Manager expectations	.159	7.006	.012	.739	2.647

Hypothesis 2b. Pearson correlation was used to estimate the bivariate relationships between staff nurse job satisfaction and the dimensions of team performance. A statistically significant correlation was found between team structure and staff nurse job satisfaction ($r = .416$, $p = .008$). Pearson correlation and ANOVA were used to estimate the bivariate relationships between staff nurse job satisfaction and military treatment facility and clinic demographic characteristics and a statistically significant correlation was found with RN assigned FTEs ($r = -.359$, $p = .025$).

A simple linear regression model was used to estimate the effect of team structure on staff nurse job satisfaction. Team structure had a statistically significant effect on staff nurse job satisfaction ($\beta = .519$, $t (37) = 2.786$, $p = .008$) and explained seventeen percent

of the variance ($R^2 = .173$). The effect of team structure on staff nurse job satisfaction ($\beta = .487, t(36) = 2.758, p = .009$) remained significant controlling for RN assigned FTEs ($\beta = -.015, t(36) = -2.318, p = .026$). These findings marginally support hypothesis 2b.

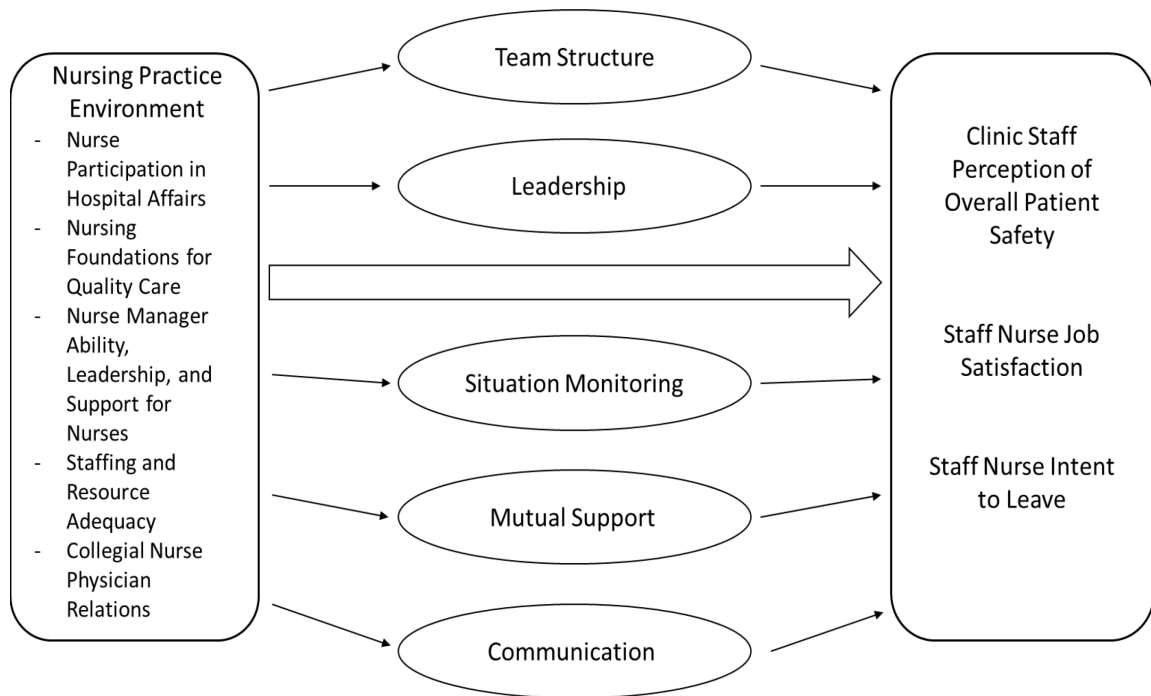
Hypothesis 2c. Pearson correlation was used to estimate the bivariate relationship between the dimensions of team performance and staff nurse intent to leave. No statistically significant relationships were found between the dimensions of team performance and staff nurse intent to leave. Therefore, hypothesis 2c was not supported.

Hypothesis 3

Hypothesis three stated US Army primary care clinic team performance will mediate the relationship between the nursing practice environment and (a) staff perception of overall safety, (b) staff nurses' job satisfaction, and (c) staff nurses' intent to leave. Unfortunately, multicollinearity among the subscales of the PES-NWI and collinearity between two composite measures of the T-TPQ violated the assumptions for regression and the PROCESS macro utilizes ordinary least squares regression (Hayes, 2018). Excluding the subscales of the PES-NWI measuring individual dimensions and examining only the PES-NWI composite score was possible to overcome the multicollinearity issue. However, the T-TPQ is not designed to be utilized as a single composite score and the collinearity between the situation monitoring and mutual support composite measures could be problematic utilizing ordinary least squares regression. The hypothesized parallel mediation model is depicted in Figure 2.

Figure 2.

Hypothesized Parallel Mediation Model



Statistically, it is possible to run mediation models examining the mediating effect of the dimensions of team performance found to have single greatest effect on the dimensions of clinic staff perception of overall patient safety and staff nurse job satisfaction. The results of this analysis are presented in Appendix C. While this analysis is statistically possible, it is also theoretically problematic. It is possible to overcome multicollinearity or collinearity for complex statistical analysis by combining variables or excluding variables (Fox, 2011; Kim, 2019). However, the PES-NWI and T-TPQ have been extensively evaluated and demonstrate reliability for examining complex, multi-dimensional theoretical concepts. Alterations and exclusions of dimensions result in the evaluation of only a portion of the intended theoretical concept. No statistically significant mediating effects were identified. Findings should be evaluated with caution

and further psychometric analysis of the PES-NWI and the T-TPQ for measurement of the nursing practice environment and team performance, respectively, in US Army primary care clinics is indicated.

Conclusions

The findings from this analysis scarcely supported hypothesis 1a. Hypotheses 1b, 1c, and 1d were supported. Hypothesis 2a and 2b were also supported. Hypothesis 2c was not supported and the partial analysis of hypothesis 3 resulted in no statistically significant mediation relationships. The interpretation of these findings is presented in chapter five.

Chapter Five

The purpose of this study was to examine the relationships among the nursing practice environment, team performance, staff perception of overall safety, staff nurse job satisfaction, and staff nurse intent to leave. Guided by the Nursing Organization and Outcomes Model (NOOM), this study hypothesized that the nursing practice environment would be associated with organizational and staff nurse outcomes in US Army primary care clinics. It was also hypothesized that the nursing practice environment would be associated with team performance as a process of care. Furthermore, it was hypothesized that team performance as a process of care would mediate the associations between the nursing practice environment and organizational and staff nurse outcomes.

Discussion of Findings

Hypothesis 1

Hypothesis one stated that the nursing practice environment would demonstrate a positive association with team performance, clinic staff perception of overall patient safety, and staff nurse job satisfaction and a negative association with staff nurse intent to leave. Military nurses had a generally favorable (79.5%) perception of the nursing practice environment of US Army primary care clinics. Mixed nursing practice environments were reported by 17.9% of the clinics and only one clinic reported an unfavorable nursing practice environment. This finding is similar to the findings of other studies performed among military nurses working in acute, or inpatient, and ambulatory care settings (Patrician et al., 2010; Swiger et al., 2018; Swiger, Patrician, et al., 2017; Swiger, Raju, et al., 2017). The PES-NWI was designed as a measure for hospital registered nurses (Lake, 2002). However, this measure has demonstrated internal

consistency across care settings (Flynn, 2007; Flynn, Thomas-Hawkins, & Bogнар, 2016; Flynn et al., 2009; Friese et al., 2012; Friese & Manojlovich, 2012). Adaptations of the PES-NWI for ambulatory care settings have been proposed and tested and one military review of the PES-NWI recommended adaptation of the PES-NWI for use among military nurses (Friese, 2012; Swiger et al., 2017). The findings of this study suggest that the PES-NWI further validity and reliability evaluation among US Army primary care nurses is indicated.

Hypothesis 1a. The nurse participation in hospital affairs domain of the nursing practice environment had a statistically significant effect on the leadership and team structure dimensions of team performance. The NOOM purports that the nursing practice environment has a direct relationship with process of care (Aiken et al., 2002). This relationship has been supported by the empirical literature examining the nursing practice environment and process of care (Breckenridge-Sproat et al., 2012; Flynn et al., 2009; Kutney-Lee et al., 2015). The relationship of clinic level care processes, such team performance, have not been examined among military nurses working in primary care settings. One study examined unfinished nursing care at the US Army Burn Center and found a high prevalence of this process of care positively associated with staffing, specifically the presence of float staff (VanFosson, Jones, & Yoder, 2018). Further research is required to compare the effects of the nursing practice environment on clinic- or unit-level processes of care in military treatment facilities to include US Army primary care clinics.

Additionally, the findings from this analysis seem conceptually reversed. It is expected that team structure and leadership would promote nurse participation in hospital

affairs, however, this study identified that nurse participation in hospital affairs has a significant effect on team structure and leadership. It is possible that nurse participation in hospital affairs, or the opportunities for nurses to interact with leadership, provides leadership real-time information regarding performance, resources, conflicts, and concerns. This timely information may enable leadership to optimize team structure resulting in higher perceptions of leadership among primary care clinic staff. Further research is required to examine the nature of these relationships.

The inclusion of thirty-nine individual clinics of various size and location is substantial, however, it did not meet the recommendation from either power analysis. Therefore, a larger representation of US Army primary care clinics may impact the results of this study. Primary care clinics are an understudied population within the military. This population may perceive the nursing practice environment, team performance, and overall perception of patient safety differently than acute, or inpatient, and specialty ambulatory care populations. The findings of this study support further evaluation of the validity and reliability of the PES-NWI, T-TPQ, and Military Health System PSCS for examining the nursing practice environment, team performance, and overall perception of patient safety, respectively, among military primary care environments to include US Army primary care clinics.

Hypothesis 1b. The nursing practice environment had a strong association with staff nurse job satisfaction. The nurse participation in hospital affairs dimension of the nursing practice environment had the single greatest effect on staff nurse job satisfaction. The theorized relationship between the nursing practice environment, especially nurse participation in hospital affairs, and nurse outcomes is extensively supported by the

empirical literature among both acute, or inpatient, and specialty ambulatory care settings. It is likely that there are additional concepts which affect military primary care nurse job satisfaction. The findings from this study support the importance of this association for US Army primary care nurses. The nursing practice environment, explained almost 58% of the variance in US Army primary care nurse job satisfaction, controlling for RN assigned FTEs.

Hypothesis 1c. Moderate associations were observed between the nursing practice environment and dimensions of clinic staff perception of overall patient safety. The theorized relationship between the nursing practice environment and organizational outcomes, such as US army primary care clinic staff perception of overall patient safety, is an extension of the NOOM supported by the empirical literature (Aiken et al., 2009; Aiken & Poghosyan, 2009; Tervo-Heikkinen et al., 2009). Often, the perception of patient safety has been evaluated as a nurse outcome due to the inclusion of only nurse responses on measures of these concepts (Sillero-Sillero & Zabalegui, 2020; Smith, Lapkin, Sim, & Halcomb, S. Smith, Lapkin, Sim, & Halcomb, 2020; White, Woodford, Britton, Newberry, & Pabico, 2020). This study evaluated the entire clinic staff perception to include physicians, nurse practitioners, physicians assistants, administrative personnel, registered nurses, licensed practical nurses, certified nursing assistants, medics, and several other specialty personnel primarily assigned to the clinics included in this study. Despite the professional diversity of this sample, the nursing practice environment, and specifically nurse manager ability, leadership, and support for nurses, has a strong relationship with this clinic-level outcome. This finding demonstrates the importance of a positive nursing practice environment and the role of the nurse manager

to US Army primary care clinic staff perception of overall patient safety. The importance of nurse manager ability, leadership, and support for nurses is echoed in the literature (Frieese et al., 2016; Grubaugh & Flynn, 2018; Khan, Jackson, Stayt, & Walthall, 2019).

Hypothesis 1d. The nursing practice environment had a strong, negative association with staff nurse intent to leave which remained significant controlling for RN assigned FTES. RN assigned FTES was also a significant predictor of staff nurse intent to leave. Among this sample, RNs reported higher intent to leave compared to LPNs. The nurse manager ability, leadership, and support for nursing dimension of the nursing practice environment had the greatest effect on staff nurse intent to leave. This finding is consistent with previous findings highlighted in a recent literature review examining factors influencing nurses' intent to leave (Khan et al., 2019). Staff nurse job dissatisfaction is a consistent predictor of staff nurse intent to leave (Kutney-Lee et al., 2015; Nantsupawat et al., 2017; Patrician et al., 2010; Shang et al., 2013). The exceptionally high job satisfaction among staff nurses working in US Army primary care clinics may contribute to their lack of or low urgency of intent to leave. Higher numbers of RN man hours (1 FTE = 168 hours) were associated with increased urgency of intent to leave. This finding warrants further investigation to determine why increased nurse staffing is associated with increased urgency of staff nurse intent to leave.

Hypothesis 2

Hypothesis two stated US Army primary care clinic team performance, operationalized as clinic staff responses on the T-TPQ, would be positively correlated with clinic staff perception of overall safety, positively associated with staff nurses' job satisfaction, and negatively associated with staff nurses' intent to leave.

Hypothesis 2a. Moderate associations were found between the dimensions of team performance and manager expectations and actions promoting patient safety, organizational learning, communication openness, frequency of events reported, and nonpunitive response to error. Situation monitoring has the single greatest effect on manager expectations and actions promoting safety and communication openness. Leadership has the single greatest effect on non-punitive response to error. Team structure and RN assigned FTEs had a significant effect on frequency of events reported.

In 2014, the Army shifted from a healthcare system to a system for health (U.S. Army Medical Command, 2014a). As part of this system-wide restructure, the Army adapted the Joint Commission's model for primary care medical homes to establish Soldier Centered Medical Homes and Community Based Medical Homes. These medical homes house three to five primary care managers (PCMs), or providers; medical doctor, doctor of osteopathy, or nurse practitioner (U.S. Army Medical Command, 2014b). These PCMs are assigned a team of support staff in a 3 to 1 ratio consisting of a team or treatment RN with any combination of LPN, medic, or certified nursing assistant (U.S. Army Medical Command, 2014b). A critical training requirement for the primary care team is Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS). TeamSTEPPS are the processes of care collectively known as team performance. Situation monitoring is the ability of a team, or clinic staff, to develop common understandings of the clinic environment and employ care strategies for monitoring the performance of their care team (King, 2008). It is interesting to note that of the five dimensions of team performance, situation monitoring has the strongest association with manager expectations and actions promoting safety and communication

openness. Nurses and nurses' assistants to include medics make up the largest portion of the US Army primary care team. The NOOM purports that nurses are the surveillance system of the medical facility (Aiken et al., 2002). The findings of this study support that theoretical proposition.

Leadership, as a process of care, is the ability to facilitate and coordinate team activities, evaluate team performance, delegate tasks, develop team knowledge, skills and abilities, conduct planning and organization, and create a positive atmosphere, or practice environment (King, 2008). Leadership had a significant effect on manager expectations promoting patient safety, communication openness, and nonpunitive response to error and the single greatest effect on nonpunitive response to error. It is possible the team leadership approach to assessing error in US Army primary care provides a more complete understanding of the multiple structures and processes surrounding negative outcomes. Staff may perceive this big picture approach to addressing negative outcomes as less punitive. The leadership team of US Army primary care clinics include a clinic officer in charge (clinic manager), a noncommissioned officer in charge (assistant clinic manager), a medical director, a practice manager, and a clinical nurse officer in charge (nurse manager). The clinic officer in charge may be any provider type, therefore, the medical director position may or may not be filled dependent upon whether an experienced physician is the clinic officer in charge. It is also important to note that all but one member of the leadership team is a military officer superior in rank to the non-commissioned officer in charge, or clinic assistant manager. The non-commissioned officer in charge is a role typically filled by an active duty military, mid-grade enlisted licensed practical nurse.

Hypothesis 2b. Team structure had a significant effect on staff nurse job satisfaction which remained significant controlling for RN assigned FTEs. Team structure is the only dimension of team performance not explicitly defined in the literature. Questions assessing this composite include “the skills of staff overlap sufficiently so that work can be shared when necessary,” “staff are held accountable for their actions,” “staff within my unit share information that enables timely decision-making by the direct patient care team,” “my unit makes efficient use of resources,” “staff understand their roles and responsibilities,” “my unit has clearly articulated goals,” and “my unit operates at a high level of efficiency” (AHRQ, 2010). Therefore, team structure is the capacity of staff to understand, articulate, and operate within their defined roles and responsibilities to efficiently utilize resources to accomplish unit goals. If nurses are the surveillance system of the medical facility, it is intuitive that a well-resourced and efficient team of professionals operating within their scope of practice would bolster the job satisfaction of nurses.

Registered nurse staffing, or the number of RN assigned FTEs, has a significant negative effect on staff nurse job satisfaction. Perhaps RNs compared to LPNs perceive lower job satisfaction among US Army primary care clinics. Though this effect is small, further research is merited to determine the nature of the association between higher RN staffing and lower staff nurse job satisfaction as this finding is counterintuitive.

Hypothesis 2c. Team performance was not associated with staff nurse intent to leave. The hypothesized relationship between process of care and nurse outcomes is based on an extension of the NOOM identified and supported in the empirical literature (Flynn et al., 2009). It is possible that a clinic process of care, such as team performance,

may not have as strong of an association with nurse outcomes as a nursing-specific process of care. A larger sample of clinics may be required to observe a smaller effect size of team performance on staff nurse outcomes.

Hypothesis 3

Hypothesis three stated US Army primary care clinic team performance will mediate the relationship between nursing practice environment and clinic staff perception of overall team performance, staff nurses' job satisfaction, and staff nurses' intent to leave. Evaluation of the assumptions for regression revealed multicollinearity between variables which suggests non-linear dependence. Theoretically, dimensions of the nursing practice environment and dimensions of team performance are expected to represent portions of the larger concept. Operationally, when the instrument for measurement of the dimensions measures similar information, we cannot be certain that we are accurately representing the individual dimensions as conceptualized.

The nursing practice environment was operationalized as staff nurse responses on the PES-NWI. This measure was initially designed and evaluated for use among acute, or inpatient, staff nurses working in hospitals (Lake, 2002). Use of the instrument has expanded to specialty ambulatory care settings to include oncology clinics, hemodialysis clinics, home health, and nursing homes (Flynn, 2007; Flynn et. al., 2010; Flynn et al., 2009; Friese, 2012; Friese & Himes-Ferris, 2013; Friese et al., 2012; Friese & Manojlovich, 2012; Friese et al., 2016; Lake, 2002; Thomas-Hawkins & Flynn, 2015; Thomas-Hawkins, Flynn, Lindgren, & Weaver, 2015). However, the findings from this study support further psychometric evaluation of the PES-NWI for use among primary care environments, especially US Army primary care clinics. A recent psychometric

analysis of the PES-NWI among a large sample of military nurses also recommended a modified four factor PES-NWI rather than the original five factor measure for use among military nurses (Swiger et. al., 2017). Our study found multicollinearity and high correlations among nurse participation in hospital affairs, nursing foundations for quality care, and nurse manager ability, leadership, and support for nurses. Robust psychometric analysis would need to be conducted to determine the loading of items on these subscales.

Team performance was operationalized as clinic staff responses on the T-TPQ. This measure was evaluated for validity and reliability on a large sample of diverse medical professionals (Keebler et al., 2014). It is primarily intended for use as a tool for evaluating team performance prior to and after completion of TeamSTEPPS training and refresher courses (AHRQ, 2010). This study utilized the measure as a cross-sectional representation of team performance. This instrument is composed of five composite measures representing the five dimensions of team performance: team structure, leadership, situation monitoring, mutual support, and communication. Evaluation of the assumptions for regression revealed multicollinearity. The findings suggest that the composite measures for situation monitoring and mutual support may be measuring similar information. Forward regression analysis revealed significant associations between situation monitoring and outcomes, however, mutual support was not included in the best predictive models. Mutual support is defined as the ability to anticipate team needs based on knowledge regarding team member responsibilities and shift the workload to balance among team members during periods of high volume or pressure (King, 2008). In US Army primary care practice environments, situation monitoring and

mutual support may be synonymous. For example, a potential mistake might be recognized by monitoring one another's performance (situation monitoring) followed by providing caution to a fellow staff member (mutual support) to mitigate danger; these activities may occur simultaneously. Further psychometric evaluation of the measure among primary care staff may reveal the need for refinement or modification of the measure for use among primary care settings.

It was statistically possible to examine the mediating effect of the single best predictor among the five dimensions of team performance on each outcome for its mediating potential in the relationship between the nursing practice environment, operationalized as the composite PES-NWI, and clinic staff overall perception of patient safety, staff nurse job satisfaction, and staff nurse intent to leave. No statistically significant mediating effects were found. The use of only the best predictor of nurse and organizational outcomes in mediation analysis provides only fragmentary information that is convoluted. To utilize a measure representing a dimension of a multi-dimensional theoretical concept such as team performance which may contain information for or from another dimension of the same concept is substandard science, therefore, further analysis of hypothesis 3 was not included in the body of this dissertation. Further analysis testing hypotheses 3a and 3b is included in Appendix C.

Usefulness of the Conceptual Framework

The NOOM was originally utilized to guide empirical studies evaluating nurses in acute, or inpatient, care settings working in hospitals (Aiken et al., 2002). The empirical literature guided by the NOOM demonstrates the usefulness of this model outside the hospital setting (Aiken et al., 2002; Flynn, 2007; Flynn et al., 2010; Flynn et al., 2012;

Thomas-Hawkins & Flynn, 2015). The NOOM posits that nurses are the internal surveillance system of the hospital and the findings of this study suggest that this proposition is also true in US Army primary care clinics (Aiken et al., 2002).

The hypothesized relationships between the nursing practice environment and (a) process of care, (b) organizational outcomes, and (c) nurse outcomes were supported. In addition, a significant relationship was identified between process of care and organizational outcomes. The NOOM was an ideal guide for conceptualizing the relationships among organizational, or clinic, structures, the nursing practice environment, process of care, organizational outcomes, and nurse outcomes. The integration of the Patient Safety Culture Framework and the Big Five in Teamwork models as organizing frameworks to conceptualize clinic staff perception of overall patient safety and team performance, respectively, was seamless and appropriate.

Conclusion

Positive nursing practice environments and nurse manager ability, leadership, and support for nursing are important to US Army primary care clinic patient safety and nurse outcomes to include intent to leave as an indicator of potential attrition. High team performance is a precursor to staff perceptions of patient safety and staff nurse job satisfaction in US Army primary care clinics; however, it is not associated with staff nurse intent to leave. Implications of these findings for nursing, recommendations, limitation of the study, and conclusions are presented in chapter six.

Chapter Six

The purpose of this study was to examine the relationships among the nursing practice environment, team performance, clinic staff overall perception of patient safety, staff nurse job satisfaction, and staff nurse intent to leave in US Army primary care clinics. Theoretical propositions were derived from the Nursing Organizations and Outcomes Model (NOOM) and paired with the Patient Safety Culture Framework and the Big Five in Teamwork model to conceptualize the clinic staff perception of overall patient safety as an organizational outcome and team performance as a process of care, respectively (AHRQ, 2016; Aiken et al., 2002; Salas et al., 2005).

Summary

Theoretical Relationships

The nursing practice environment, defined as the attributes or characteristics of an organization which facilitate or impede the professional practice of nurses, is a multidimensional concept including nurse participation in hospital affairs, nursing foundations for quality care, nurse manager ability, leadership and support for nurses, staffing and resource adequacy, and collegial nurse physician relations (Lake, 2002). According to the NOOM, the nursing practice environment has a direct effect on process of care, nurse outcomes, and patient outcomes.

Team performance was conceptualized as a process of care and defined as clinic staff's perceptions of team skills and behaviors (AHRQ, 2010; Aiken et al., 2002). Team performance is a multi-dimensional concept including team structure, leadership, situation monitoring, mutual support, and communication (AHRQ, 2010). In the NOOM,

process of care is subsequent organizational structures and the nursing practice environment and antecedent to outcomes (Aiken et al., 2002).

Clinic staff perception of overall safety was conceptualized as an organizational outcome, or clinic outcome, and defined as staff perceptions of the clinic's provision of safe, quality care (AHRQ, 2016; Aiken et al., 2002). The NOOM suggests direct relationships between the nursing practice environment and process of care with nurse and patient outcomes (Aiken et al., 2002). Organizational outcomes are an addition to this conceptual model supported by the empirical literature (Aiken et al., 2009; Aiken & Poghosyan, 2009; Friese et al., 2016; Gasparino & Guirardello, 2017; Hinno et al., 2012; Kutney-Lee et al., 2015; Patrician et al., 2010; Panunto & Guirardello, 2013; Shang et al., 2013; Sillero-Sillero & Zabalegui, 2020; Smith et al., 2020; Tervo-Heikkinen et al., 2009; White et al., 2020).

Staff nurse job satisfaction and staff nurse intent to leave were conceptualized as nurse outcomes and defined as the level of satisfaction nurses perceive with their current job and nurses' intent to leave their current job, respectively. Nurse outcomes are subsequent the nursing practice environment according to the NOOM (Aiken et al., 2002). One empirical research study identified a significant direct relationship between process of care and nurse outcomes (Flynn et al., 2009). This relationship is an addition to the NOOM evaluated in this study.

Hypotheses

Upon thorough review of the theoretical and empirical literature pertaining to the phenomena of interest the following hypotheses were developed for evaluation in this study:

1. US Army primary care clinic nursing practice environments, operationalized as staff nurse responses on the PES-NWI, will be
 - a) Positively associated with team performance; operationalized as clinic staff responses on the TeamSTEPPS Teamwork Perceptions Questionnaire (T-TPQ).
 - b) Positively associated with staff nurses' job satisfaction; operationalized as staff nurse responses on a single item measure.
 - c) Positively associated with staff perception of overall safety; operationalized as clinic staff responses on the Military Health System Patient Safety Culture Survey (MHS PSCS).
 - d) Negatively associated with staff nurses' intent to leave; operationalized as staff nurse responses on a single item measure.
2. US Army primary care clinic team performance, operationalized as clinic staff responses on the T-TPQ, will be
 - a) Positively associated with staff perception of overall safety; operationalized as clinic staff responses on the MHS PSCS.
 - b) Positively associated with staff nurses' job satisfaction; operationalized as staff nurse responses on a single item measure.
 - c) Negatively associated with staff nurses' intent to leave; operationalized as staff nurse responses on a single item measure.
3. US Army primary care clinic team performance will mediate the relationship between nursing practice environment and
 - a) Staff perception of overall safety.

- b) Staff nurses' job satisfaction.
- c) Staff nurses' intent to leave.

Sample Description

The sample for this study included thirty-nine US Army primary care clinics representing military treatment facilities located in eighteen of the United States (33) and Germany (6). Medical treatment facilities included community-based medical homes (8), small clinics (6), medium clinics (6), large clinics (5), small hospitals (6), large hospitals (2), and medical centers (6). These facilities represented four Regional Health Commands: Atlantic (17), Central (12), Europe (6), and Pacific (4). Five Regional Medical Commands were also represented: Northern (11), Southern (12), Western (8), Europe (6), Pacific (2).

Instruments

Secondary data collected in 2016 containing US Army primary care clinic staff responses on the Practice Environment Scale of the Nursing Work Index (PES-NWI), the TeamSTEPPS Teamwork Perceptions Questionnaire (T-TPQ), and the Military Health System Patient Safety Culture Survey (PSCS) were requested from the office of the Chief of the Army Nurse Corps and the Defense Health Agency Patient Safety and Analytics and Evaluations directorates (AHRQ, 2010; Lake, 2002). These data were paired with staffing and workload data from 2016 maintained by the Defense Health Agency Analytics and Evaluations directorate.

Results

Hypothesis one and two were tested using Pearson correlation and regression analyses. Hypothesis 1a, 1b, 1c, 1d, 2a, and 2b were partially or completely supported.

Hypothesis 2c was not supported. Hypothesis 3 was not supported. Independent variables and mediator variables demonstrated multicollinearity and collinearity which limited the evaluation of hypothesis three.

Limitations

Controlling the healthcare environment is often challenging in a military population where the scheduled turnover of staff for relocation and frequent turnover due to military operations, training, and education are standard practice. Military and many federal civilian healthcare staff rotate every two to three years to a different organization, deploy in support of humanitarian and military missions, and regularly attend training and education courses outside of the clinical setting. The utilization of a cross-section of secondary data limited the control of data collection methods, measurement selection, and variable definition in addition to other study design aspects. Measures utilized in this study to examine the nursing practice environment, team performance, clinic staff perception of overall patient safety, staff nurse job satisfaction, and staff nurse intent to leave relied on self-report and self-report measures are prone to inflation or common method variance which may introduce bias and impact validity (Cooper et al., 2020).

Additionally, there are likely numerous variables associated with clinic staff perception of overall patient safety, staff nurse job satisfaction, and staff nurse intent to leave which were not evaluated in this study. This study only evaluated military treatment facility size, regional medical command, regional health command, and clinic level staffing and workload variables. Unmeasured confounders may alter results in a way unknown to the investigator. US Army primary care clinics are a unique micro-

organization within Army Medicine. The generalizability of the findings from this study may be limited to primary care clinics operating in military treatment facilities.

Recommendations

Based on the findings from this study the following recommendations are presented for nursing practice, policy, and future research:

1. Thorough evaluation of the current procedure for appointment, education, and training for the preparation and continued development of the military nurse manager, especially in US Army primary care clinics, to ensure military officers and civilians serving in these roles have the tools needed to successfully lead, manage, and resource their clinics.
2. Further evaluation, refinement, and robust psychometric testing of the PES-NWI, T-TPQ, and Military Health System PSCS for use among specific care environments to include US Army primary care clinics.
3. The mediating potential of clinic processes of care to include team performance between the nursing practice environment and organizational and nurse outcomes in US Army, and all military, primary care clinics merit further evaluation. Larger sample sizes gathered through primary data collection techniques are recommended for future studies.
4. A standard measure for primary care nursing workload evaluation would enhance understanding, increase practical interpretation, and allow for the comparison of military and civilian sector primary care settings. Currently, no standardized measure of nursing workload for primary care settings has been identified.

5. Future research to evaluate the defined staffing ratios in primary care clinics implemented as part of the Army primary care medical home structure is recommended, especially in relation to the nursing practice environment, process of care, and outcomes.

Conclusions

The nursing practice environment has a unique relationship with US Army primary care clinic processes of care, organizational outcomes, and nurse outcomes to include nurse intent to leave as an indicator of potential attrition. The dimensions of the nursing practice environment evaluated in acute, or inpatient, care settings and specialty ambulatory care settings may differ from the dimensions of the nursing practice environment in US Army primary care settings. The findings from this study support the importance of a positive nursing practice environment, especially nurse manager ability, leadership, and support for nurses, to clinic outcomes such as the perception of overall patient safety and nurse outcomes to include job satisfaction and intent to leave as an indicator of attrition.

Team performance is a complex collection of care processes. The nursing practice environment has a small, but significant effect on team performance as a clinic process of care. However, the processes evaluated within team performance may require further evaluation among US Army primary care clinic environments. Dimensions of this concept did not appear to remain independent, however, dimensions of team performance demonstrated statistically significant effects on staff nurse job satisfaction and several dimensions of clinic staff perception of overall patient safety. Team performance did not mediate the relationship between the nursing practice environment and (a) clinic staff

perception of overall patient safety, (b) staff nurse job satisfaction, and (c) staff nurse intent to leave as an indicator of potential attrition.

Implications for Nursing

The relationships and propositions purported by the NOOM and tested in this study were supported. Nurses and their support teams to include medics and nursing assistants are the largest proportion of the workforce in US Army primary care clinics (U.S. Army Medical Command, 2014b). The findings from this study support that this team of professionals serve as the surveillance system of US Army primary care clinics. Furthermore, a positive practice environment promotes positive outcomes for US Army primary care nurses. Findings from this study support continued evaluation of US Army primary care nurse practice environments to determine the factors most important to military primary care nurses which facilitate or impede their professional practice (Lake, 2002).

The role of the nurse manager and their ability, leadership, and support for nurses is important to both staff nurse and clinic-level outcomes. This dimension of the nursing practice environment had the single greatest effect on nine of the twelve dimensions of clinic staff overall perception of patient safety and staff nurse intent to leave. The preparation and competency of the nurse manager in US Army primary care clinics promotes higher perceptions of overall patient safety. These higher perceptions of patient safety may be reasonably linked to actual patient safety. Additionally, nurse manager ability, leadership, and support for nurses promotes positive staff nurse outcomes to include lower intent to leave as an indicator of potential attrition. Findings from this study demonstrate the importance of formal education, training, and initial and iterative

competency measurement of nurses serving as managers in US Army primary care clinics. US Army primary care clinics experiencing high attrition of staff nurses may consider implementing interventions which support the nurse manager as a means to retain highly competent and skilled staff nurses.

Bibliography

- Adolfo, C. S. (2019). Quality and safety of the nurse practice environment: Implications for management commitment to a culture of safety. *Nurs Forum*, 54(4), 537-544. doi:10.1111/nuf.12367
- Agency for Healthcare Research and Quality. (2010). TeamSTEPPS Teamwork Perceptions Questionnaire Manual. In C. f. Q. I. a. P. Safety (Ed.).
- Agency for Healthcare Research and Quality. (2011). Types of Health Care Quality Measures. Retrieved from <http://www.ahrq.gov/talkingquality/measures/types.html>
- Agency for Healthcare Research and Quality. (2016). AHRQ Hospital Survey on Patient Safety Culture: Users Guide. In D. o. H. a. H. Services (Ed.), (Vol. 15(16)-0049-EF).
- Aiken, Clarke, S. P., & Sloane, D. M. (2002). Hospital staffing, organization, and quality of care: cross-national findings. *International Journal for Quality in Health Care*, 14(1), 5-14. doi:10.1093/intqhc/14.1.5
- Aiken, H. L., Sochalski, T. J., & Lake, T. E. (1997). Studying Outcomes of Organizational Change in Health Services. *Medical Care*, 35(11 Suppl), NS6-NS18.
- Aiken, L. H., Buchan, J., Ball, J., & Rafferty, A. M. (2008). Transformative impact of Magnet designation: England case study. *J Clin Nurs*, 17(24), 3330-3337. doi:10.1111/j.1365-2702.2008.02640.x
- Aiken, L. H., Clarke, S. P., & Sloane, D. M. (2002). Hospital staffing, organization, and quality of care: Cross-national findings. *Nursing Outlook*, 50(5), 187-194. doi:10.1067/mno.2002.126696
- Aiken, L. H., Clarke, S. P., Sloane, D. M., Lake, E. T., & Cheney, T. (2008). Effects of hospital care environment on patient mortality and nurse outcomes. *J Nurs Adm*, 38(5), 223-229. doi:10.1097/01.NNA.0000312773.42352.d7
- Aiken, L. H., Clarke, S. P., Sloane, D. M., Lake, E. T., & Cheney, T. T. (2009). Effects of Hospital Care Environment on Patient Mortality and Nurse Outcomes. *JONA: The Journal of Nursing Administration*, 39(7/8 Suppl), S45-S51. doi:10.1097/NNA.0b013e3181aeb4cf
- Aiken, L. H., & Patrician, P. A. (2000). Measuring organizational traits of hospitals: the Revised Nursing Work Index. *Nurs Res*, 49(3), 146-153.
- Aiken, L. H., & Poghosyan, L. (2009). Evaluation of 'Magnet Journey to Nursing Excellence Program' in Russia and Armenia. *Journal of Nursing Scholarship*, 41(2), 166-174. doi:10.1111/j.1547-5069.2009.01268.x
- Aiken, L. H., Sloane, D. M., Lake, E. T., Sochalski, J., & Weber, A. L. (1999). Organization and outcomes of inpatient AIDS care. *Med Care*, 37(8), 760-772.
- Aiken, L. H., Smith, H. L., & Lake, E. T. (1994). Lower Medicare mortality among a set of hospitals known for good nursing care. *Med Care*, 32(8), 771-787.
- Ambani, Z., Kutney-Lee, A., & Lake, E. T. (2020). The nursing practice environment and nurse job outcomes: A path analysis of survey data. *J Clin Nurs*, 29(13-14), 2602-2614. doi:10.1111/jocn.15283

- Army Medical Department. (2015). Health Executive Leadership Organization Implementation. In (Vol. OPORD 16-08).
- Army Medicine 2020 Campaign Plan. (2013). Retrieved from
- Army Medicine. (2019). Mission. Retrieved from <https://www.army.mil/armymedicine#org-about>
- Bagnasco, A., Dasso, N., Rossi, S., Timmins, F., Watson, R., Aleo, G., . . . Sasso, L. (2020). A cross-sectional multisite exploration of Italian paediatric nurses' reported burnout and its relationship to perceptions of clinical safety and adverse events using the RN4CAST@IT-Ped. *J Adv Nurs*. doi:10.1111/jan.14401
- Blake, N., Leach, L. S., Robbins, W., Pike, N., & Needleman, J. (2013). Healthy Work Environments and Staff Nurse Retention. *Nursing Administration Quarterly*, 37(4), 356-370. doi:10.1097/NAQ.0b013e3182a2fa47
- Breckenridge-Sproat, S., Freeman, J. J., Belew, D. L., Loan, L. A., McCarthy, M. S., & Patrician, P. A. (2015). A nursing care redesign framework for system wide improvement: The patient caringtouch system. *Clinical Nursing Studies*, 3(4), 72-78.
- Breckenridge-Sproat, S., Johantgen, M., & Patrician, P. A. (2012). Influence of Unit-Level Staffing on Medication Errors and Falls in Military Hospitals. *Western Journal of Nursing Research*, 34(4), 455-474. doi:10.1177/0193945911407090
- Breckenridge-Sproat, S., Swiger, P. A., Belew, D. L., Raju, D., Patrician, P. A., & Loan, L. A. (2017). A program evaluation of the Patient CaringTouch System: A pre- and postimplementation assessment. *Nursing Outlook*, 65, S109-S119. doi:10.1016/j.outlook.2017.06.011
- Carifio, J., & Perla, R. (2008). Resolving the 50-year debate around using and misusing Likert scales. *Medical education*, 42(12), 1150-1152. doi:10.1111/j.1365-2923.2008.03172.x
- Chang, Y. P., Lee, D. C., Chang, S. C., Lee, Y. H., & Wang, H. H. (2019). Influence of work excitement and workplace violence on professional commitment and turnover intention among hospital nurses. *J Clin Nurs*, 28(11-12), 2171-2180. doi:10.1111/jocn.14808
- Cheng, C.-Y., & Liou, S.-R. (2011). Intention to leave of Asian nurses in US hospitals: does cultural orientation matter? *Journal of Clinical Nursing*, 20(13-14), 2033-2042. doi:10.1111/j.1365-2702.2010.03594.x
- Cheng, L., Cui, Y., Chen, Q., Ye, Y., Liu, Y., Zhang, F., . . . Hu, X. (2020). Paediatric nurses' general self-efficacy, perceived organizational support and perceived professional benefits from Class A tertiary hospitals in Jilin province of China: the mediating effect of nursing practice environment. *BMC Health Serv Res*, 20(1), 12. doi:10.1186/s12913-019-4878-3
- Cho, H., & Han, K. (2018). Associations Among Nursing Work Environment and Health-Promoting Behaviors of Nurses and Nursing Performance Quality: A Multilevel Modeling Approach. *J Nurs Scholarsh*, 50(4), 403-410. doi:10.1111/jnu.12390
- Choi, J., Flynn, L., & Aiken, L. H. (2012). Nursing Practice Environment and Registered Nurses' Job Satisfaction in Nursing Homes. *Gerontologist*, 52(4), 484-492. doi:10.1093/geront/gnr101

- Choi, S., Cheung, K., & Pang, S. (2013). Attributes of nursing work environment as predictors of registered nurses' job satisfaction and intention to leave. *Journal of Nursing Management*, 21(3), 429-439. doi:10.1111/j.1365-2834.2012.01415.x
- Chyung, S. Y., Barkin, J. R., & Shamsy, J. A. (2018). Evidence-Based Survey Design: The Use of Negatively Worded Items in Surveys. *Performance Improvement*, 57(3), 16-25. doi:10.1002/pfi.21749
- Chyung, S. Y. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-Based Survey Design: The Use of a Midpoint on the Likert Scale. *Performance improvement (International Society for Performance Improvement)*, 56(10), 15-23. doi:10.1002/pfi.21727
- Cooper, B., Eva, N., Zarea Fazlelahi, F., Newman, A., Lee, A., & Obschonka, M. (2020). Addressing common method variance and endogeneity in vocational behavior research: A review of the literature and suggestions for future research. *Journal of Vocational Behavior*, 121, 103472. doi:https://doi.org/10.1016/j.jvb.2020.103472
- Cronbach, L. J. (1957). The two disciplines of scientific psychology. *American Psychologist*, 12(11), 671-684. doi:10.1037/h0043943
- Cronbach, L. J. (1975). Beyond the two disciplines of scientific psychology. *American Psychologist*, 30(2), 116-127. doi:10.1037/h0076829
- Crow, S. M., & Hartman, S. J. (2005). Nurse attrition as a process. *Health Care Manager*, 24(3), 276-283. Retrieved from <https://login.proxy.libraries.rutgers.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=c8h&AN=106543082&site=ehost-live>
- Daoud, J. (2017). *Multicollinearity and Regression Analysis*.
- Defense Health Agency. (2014). *Military Health System Review*. Retrieved from
- Defense Health Agency. (2017). *Stakeholder Report*. Retrieved from <https://www.health.mil/About-MHS/OASDHA/Defense-Health-Agency>
- Denison, D. R. (1996). What is the Difference Between Organizational Culture and Organizational Climate? A native's view on a decade of paradigm wars. *Academy of Management Review*, 21(3), 619-654. doi:10.5465/AMR.1996.9702100310
- Dols, J. D., Chargualaf, K. A., & Martinez, K. S. (2019). Cultural and Generational Considerations in RN Retention. *J Nurs Adm*, 49(4), 201-207. doi:10.1097/nnn.0000000000000738
- Donabedian, A. (1966). Evaluating the Quality of Medical Care. *The Milbank Memorial Fund Quarterly*, 44, 166-206.
- Dormann, C. F., Elith, J., Bacher, S., Buchmann, C., Carl, G., Carré, G., . . . Lautenbach, S. (2013). Collinearity: a review of methods to deal with it and a simulation study evaluating their performance. *Ecography (Copenhagen)*, 36(1), 27-46. doi:10.1111/j.1600-0587.2012.07348.x
- Flinkman, M., & Salanterä, S. (2015). Early career experiences and perceptions - a qualitative exploration of the turnover of young registered nurses and intention to leave the nursing profession in Finland. *Journal of Nursing Management*, 23(8), 1050-1057. doi:10.1111/jonm.12251
- Flynn, L. (2007). Extending Work Environment Research into Home Health Settings. *Western Journal of Nursing Research*, 29(2), 200-212. doi:10.1111/0193945906292554

- Flynn, L., Liang, Y., Dickson, G. L., & Aiken, L. H. (2010). Effects of nursing practice environments on quality outcomes in nursing homes. *Journal of the American Geriatrics Society*, 58(12), 2401-2406. doi:10.1111/j.1532-5415.2010.03162.x
- Flynn, L., Liang, Y., Dickson, G. L., Xie, M., & Suh, D.-C. (2012). Nurses' Practice Environments, Error Interception Practices, and Inpatient Medication Errors. *Journal of Nursing Scholarship*, 44(2), 180-186. doi:10.1111/j.1547-5069.2012.01443.x
- Flynn, L., Thomas-Hawkins, C., & Bognar, L. (2016). Continuing Nursing Education. Work Environment Characteristics Valued by Outpatient Hemodialysis Unit Nurse Managers. *Nephrology Nursing Journal*, 43(5), 403-446. Retrieved from <https://login.proxy.libraries.rutgers.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=c8h&AN=118640474&site=ehost-live>
- Flynn, L., Thomas-Hawkins, C., & Clarke, S. P. (2009). Organizational Traits, Care Processes, and Burnout Among Chronic Hemodialysis Nurses. *Western Journal of Nursing Research*, 31(5), 569-582. doi:10.1177/0193945909331430
- Foley, B. J., Kee, C. C., Minick, P., Harvey, S. S., & Jennings, B. M. (2002). Characteristics of nurses and hospital work environments that foster satisfaction and clinical expertise. *J Nurs Adm*, 32(5), 273-282.
- Fox, J. (2011). Collinearity. In *Regression Diagnostics* (pp. 11-21). Thousand Oaks, CA: SAGE Publications.
- Friese, C. R. (2012). Practice Environments of Nurses Employed in Ambulatory Oncology Settings: Measure Refinement. *Oncology Nursing Forum*, 39(2), 166-172. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3296284/pdf/nihms-281909.pdf>
- Friese, C. R., & Himes-Ferris, L. (2013). Nursing Practice Environments and Job Outcomes in Ambulatory Oncology Settings. *Journal of Nursing Administration*, 43(3), 149-154. doi:10.1097/NNA.0B013e318283dc3f
- Friese, C. R., Himes-Ferris, L., Frasier, M. N., McCullagh, M. C., & Griggs, J. J. (2012). Structures and processes of care in ambulatory oncology settings and nurse-reported exposure to chemotherapy. *BMJ Quality & Safety*, 21(9), 753-759. doi:10.1136/bmjqs-2011-000178
- Friese, C. R., & Manojlovich, M. (2012). Nurse-Physician Relationships in Ambulatory Oncology Settings. *Journal of Nursing Scholarship*, 44(3), 258-265. doi:10.1111/j.1547-5069.2012.01458.x
- Friese, C. R., Siefert, M. L., Thomas-Frost, K., Walker, S., & Ponte, P. R. (2016). Using Data to Strengthen Ambulatory Oncology Nursing Practice. *Cancer Nursing*, 39(1), 74-79. doi:10.1097/NCC.0000000000000240
- Fuentelsaz-Gallego, C., Moreno-Casbas, M. T., & González-María, E. (2013). Validation of the Spanish version of the questionnaire Practice Environment Scale of the Nursing Work Index. *International Journal of Nursing Studies*, 50(2), 274-280. doi:10.1016/j.ijnurstu.2012.08.001
- Gabriel, A. S., Erickson, R. J., Moran, C. M., Diefendorff, J. M., & Bromley, G. E. (2013). A Multilevel Analysis of the Effects of the Practice Environment Scale of the Nursing Work Index on Nurse Outcomes. *Research in Nursing & Health*, 36(6), 567-581. doi:10.1002/nur.21562

- Gasparino, R. C., & Guirardello, E. B. (2017). Validation of the Practice Environment Scale to the Brazilian culture. *J Nurs Manag*, 25(5), 375-383. doi:10.1111/jonm.12475
- Gasparino, R. C., & Guirardello, E. d. B. (2017). Validation of the Practice Environment Scale to the Brazilian culture. *Journal of Nursing Management*, 25(5), 375-383. doi:10.1111/jonm.12475
- Goh, Y. S., & Lopez, V. (2016a). Acculturation, quality of life and work environment of international nurses in a multi-cultural society: A cross-sectional, correlational study. *Applied Nursing Research*, 30, 111-118. doi:10.1016/j.apnr.2015.08.004
- Goh, Y. S., & Lopez, V. (2016b). Job satisfaction, work environment and intention to leave among migrant nurses working in a publicly funded tertiary hospital. *Journal of Nursing Management*, 24(7), 893-901. doi:10.1111/jonm.12395
- Grubaugh, M. L., & Flynn, L. (2018). Relationships among Nurse Manager Leadership Skills, Conflict Management, and Unit Teamwork. *Journal of Nursing Administration*, 48(7-8), 383-388. doi:10.1097/NNA.0000000000000633
- Halcomb, E., & Bird, S. (2020). Job Satisfaction and Career Intention of Australian General Practice Nurses: A Cross-Sectional Survey. *J Nurs Scholarsh*, 52(3), 270-280. doi:10.1111/jnu.12548
- Hallowell, S. G., Rogowski, J. A., & Lake, E. T. (2019). How Nurse Work Environments Relate to the Presence of Parents in Neonatal Intensive Care. *Adv Neonatal Care*, 19(1), 65-72. doi:10.1097/anc.0000000000000431
- Hanrahan, N. P. (2007). Measuring inpatient psychiatric environments: psychometric properties of the Practice Environment Scale-Nursing Work Index (PES-NWI). *The international journal of psychiatric nursing research*, 12(3), 1521.
- Hayes, A. (2018). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A regression-based approach* (D. A. Kenny Ed. 2nd ed.). New York, NY: The Guilford Press.
- Hayes, L., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., . . . Stone, P. W. (2006). Nurse turnover: a literature review. *Int J Nurs Stud*, 43(2), 237-263. doi:10.1016/j.ijnurstu.2005.02.007
- Hiler, C. A., Hickman, J. R. L., Reimer, A. P., & Wilson, K. (2018). PREDICTORS OF MORAL DISTRESS IN A US SAMPLE OF CRITICAL CARE NURSES. *American Journal of Critical Care*, 27(1), 59-66. doi:10.4037/ajcc2018968
- Hinno, S., Partanen, P., & Vehviläinen-Julkunen, K. (2012). The professional nursing practice environment and nurse-reported job outcomes in two European countries: a survey of nurses in Finland and the Netherlands. *Scandinavian Journal of Caring Sciences*, 26(1), 133-143. doi:10.1111/j.1471-6712.2011.00920.x
- Huang, X., Wang, L., Dong, X., Li, B., & Wan, Q. (2020). Effects of Nursing Work Environment on Work-Related Outcomes among Psychiatric Nurses: A Mediating Model. *J Psychiatr Ment Health Nurs*. doi:10.1111/jpm.12665
- Jarin, O., Flynn, L., Lake, E. T., & Aiken, L. H. (2014). Home Health Agency Work Environments and Hospitalizations. *Medical Care*, 52(10).
- Keebler, J. R., Dietz, A. S., Lazzara, E. H., Benishek, L. E., Almeida, S. A., Toor, P. A., . . . Salas, E. (2014). Validation of a teamwork perceptions measure to increase patient safety. *BMJ Qual Saf*, 23(9), 718-726. doi:10.1136/bmjqs-2013-001942

- Khan, N., Jackson, D., Stayt, L., & Walthall, H. (2019). Factors influencing nurses' intentions to leave adult critical care settings. *Nurs Crit Care*, 24(1), 24-32. doi:10.1111/nicc.12348
- Kim, J. H. (2019). Multicollinearity and misleading statistical results. *Korean journal of anesthesiology*, 72(6), 558-569. doi:10.4097/kja.19087
- King, H., Battle, J., Baker, D., Alonso, A., Salas, E., Webster, J., Toomey, L., Salisbury, M. (2008). TeamSTEPPS: Team Strategies and Tools to Enhance Performance and Patient Safety. In B. J. Henriksen K, Keyes MA, et al. (Ed.), *Performance and Tools* (Vol. 3). Rockville, MD: Agency for Healthcare Research and Quality.
- Knupp, A. M., Patterson, E. S., Ford, J. L., Zurmehly, J., & Patrick, T. (2018). Associations Among Nurse Fatigue, Individual Nurse Factors, and Aspects of the Nursing Practice Environment. *J Nurs Adm*, 48(12), 642-648. doi:10.1097/nna.0000000000000693
- Koo, T. K., & Li, M. Y. (2016). A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research. *Journal of chiropractic medicine*, 15(2), 155-163. doi:10.1016/j.jcm.2016.02.012
- Koy, V., Yunibhand, J., Angsuroch, Y., Turale, S., & Rojnawee, S. (2020). Registered nurses' perceptions of factors influencing nursing care quality: A structural equation modeling study. *Nurs Health Sci*, 22(1), 91-98. doi:10.1111/nhs.12653
- Kramer, M., & Hafner, L. P. (1989). Shared values: impact on staff nurse job satisfaction and perceived productivity. *Nurs Res*, 38(3), 172-177.
- Kutney-Lee, A., Stimpfel, A. W., Sloane, D. M., Cimiotti, J. P., Quinn, L. W., & Aiken, L. H. (2015). Changes in patient and nurse outcomes associated with magnet hospital recognition. *Medical Care*, 53(6), 550-557. doi:10.1097/MLR.0000000000000355
- Lake, E. T. (2002). Development of the practice environment scale of the nursing work index†‡. *Research in Nursing & Health*, 25(3), 176-188. doi:10.1002/nur.10032
- Lake, E. T. (2007). The Nursing Practice Environment. *Medical Care Research and Review*, 64(2_suppl), 104S-122S. doi:10.1177/1077558707299253
- Lake, E. T., & Friese, C. R. (2006). Variations in Nursing Practice Environments: Relation to Staffing and Hospital Characteristics. *Nursing Research*, 55(1), 1-9. doi:10.1097/00006199-200601000-00001
- Lake, E. T., Hallowell, S. G., Kutney-Lee, A., Hatfield, L. A., Del Guidice, M., Boxer, B. A., . . . Aiken, L. H. (2016). Higher Quality of Care and Patient Safety Associated With Better NICU Work Environments. *Journal of Nursing Care Quality*, 31(1), 24-32. doi:10.1097/NCQ.0000000000000146
- Lake, E. T., Sanders, J., Duan, R., Riman, K. A., Schoenauer, K. M., & Chen, Y. (2019). A Meta-Analysis of the Associations Between the Nurse Work Environment in Hospitals and 4 Sets of Outcomes. *Medical Care*, 57(5), 353-361. doi:10.1097/MLR.0000000000001109
- Lake, E. T., Staiger, D., Edwards, E. M., Smith, J. G., & Rogowski, J. A. (2018). Nursing Care Disparities in Neonatal Intensive Care Units. *Health Services Research*, 53(S1), 3007-3026. doi:10.1111/1475-6773.12762

- Lasater, K. B., Sloane, D. M., McHugh, M. D., & Aiken, L. H. (2019). Quality of End-of-Life Care and Its Association with Nurse Practice Environments in U.S. Hospitals. *J Am Geriatr Soc*, 67(2), 302-308. doi:10.1111/jgs.15671
- Lavoie-Tremblay, M., Paquet, M., Marchionni, C., & Drevniok, U. (2011). Turnover intention among new nurses: a generational perspective. *Journal for Nurses in Staff Development*, 27(1), 39-45. doi:10.1097/NND.0b013e31819945c1
- Lee, M. A., Ju, Y. H., & Lim, S. H. (2020). A study on the intent to leave and stay among hospital nurses in Korea: A cross-sectional survey. *J Nurs Manag*, 28(2), 332-341. doi:10.1111/jonm.12929
- Lee, S.-Y., Kim, C.-W., Kang, J.-H., Yoon, T.-H., & Kim, C. S. (2014). Influence of the nursing practice environment on job satisfaction and turnover intention. *Journal of Preventive Medicine & Public Health*, 47(5), 258-265. doi:10.3961/jpmph.14.002
- Leung, S.-O. (2011). A Comparison of Psychometric Properties and Normality in 4-, 5-, 6-, and 11-Point Likert Scales. *Journal of Social Service Research*, 37(4), 412-421. doi:10.1080/01488376.2011.580697
- Li, B., Li, Z., & Wan, Q. (2019). Effects of work practice environment, work engagement and work pressure on turnover intention among community health nurses: Mediated moderation model. *J Adv Nurs*, 75(12), 3485-3494. doi:10.1111/jan.14130
- Liao, R. W., Yeh, M. L., Lin, K. C., & Wang, K. Y. (2020). A Hierarchical Model of Occupational Burnout in Nurses Associated With Job-Induced Stress, Self-Concept, and Work Environment. *J Nurs Res*, 28(2), e79. doi:10.1097/jnr.0000000000000348
- Lin, S.-Y., Chiang, H.-Y., & Chen, I.-L. (2011). Comparing nurses' intent to leave or stay: Differences of practice environment perceptions. *Nursing & Health Sciences*, 13(4), 463-467. doi:10.1111/j.1442-2018.2011.00640.x
- Liu, K., You, L.-M., Chen, S.-X., Hao, Y.-T., Zhu, X.-W., Zhang, L.-F., & Aiken, L. H. (2012). The relationship between hospital work environment and nurse outcomes in Guangdong, China: a nurse questionnaire survey. *Journal of Clinical Nursing*, 21(9-10), 1476-1485. doi:10.1111/j.1365-2702.2011.03991.x
- Lumillo-Gutierrez, I., Romero-Sánchez, J. M., D'Agostino, F., Paramio-Cuevas, J. C., Fabrellas, N., Moreno-Corral, L. J., & Paloma-Castro, O. (2019). Nurses' characteristics and practice environments: Comparison between clusters with different attitude and utilisation profiles regarding nursing diagnosis. *J Nurs Manag*, 27(1), 93-102. doi:10.1111/jonm.12652
- Maslach, C., Jackson, S. E., Leiter, M. P., Schaufeli, W. B., & Schwab, R. L. (2019). Maslach Burnout Inventory. Retrieved from <https://www.mindgarden.com/117-maslach-burnout-inventory>
- McMullan, S. P., Thomas-Hawkins, C., & Shirey, M. R. (2017). Certified Registered Nurse Anesthetist Perceptions of Factors Impacting Patient Safety. *Nursing Administration Quarterly*, 41(1), 56-69. doi:10.1097/NAQ.0000000000000204
- Military Health System. (2020). MDR, M2, ICDs Functional References and Specifications. Retrieved from <https://www.health.mil/Military-Health->

- Topics/Technology/Support-Areas/MDR-M2-ICD-Functional-References-and-Specification-Documents/?type=All&page=4#pagingAnchor
- Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior*, 14(2), 224-247. doi:[https://doi.org/10.1016/0001-8791\(79\)90072-1](https://doi.org/10.1016/0001-8791(79)90072-1)
- Nantsupawat, A., Kunaviktikul, W., Nantsupawat, R., Wichaikhum, O. A., Thienthong, H., & Poghosyan, L. (2017). Effects of nurse work environment on job dissatisfaction, burnout, intention to leave. *International Nursing Review*, 64(1), 91-98. doi:10.1111/inr.12342
- National Quality Forum. (2019). Practice Environment Scale of the Nursing Work Index. Retrieved from <http://www.qualityforum.org/QPS/QPSTool.aspx?m=3450&e=1#qpsPageState=%7B%22TabType%22%3A1,%22TabContentType%22%3A2,%22ItemsToCompare%22%3A%5B%5D,%22StandardID%22%3A3450,%22EntityTypeID%22%3A1%7D>
- Nelson-Brantley, H. V., Park, S. H., & Bergquist-Beringer, S. (2018a). Characteristics of the Nursing Practice Environment Associated With Lower Unit-Level RN Turnover. *J Nurs Adm*, 48(1), 31-37. doi:10.1097/nna.0000000000000567
- Nelson-Brantley, H. V., Park, S. H., & Bergquist-Beringer, S. (2018b). Characteristics of the Nursing Practice Environment Associated With Lower Unit-Level RN Turnover. *Journal of Nursing Administration*, 48(1), 31-37. doi:10.1097/NNA.0000000000000567
- Nelson, S. T., & Flynn, L. (2015). Relationship Between Missed Care and Urinary Tract Infection. *Geriatric Nursing*, 36(2), 126-130. doi:10.1016/j.gerinurse.2014.12.009
- Norman, G. (2010). Likert scales, levels of measurement and the “laws” of statistics. *Advances in Health Sciences Education*, 15(5), 625-632. doi:10.1007/s10459-010-9222-y
- Numminen, O., Ruoppa, E., Leino - Kilpi, H., Isoaho, H., Hupli, M., & Meretoja, R. (2016). Practice environment and its association with professional competence and work-related factors: perception of newly graduated nurses. *Journal of Nursing Management*, 24(1), E1-E11. doi:10.1111/jonm.12280
- Nursing Solutions Inc. (2018). *National Health Care Retention & RN Staffing Report*. Retrieved from www.nursingsolutions.com
- Ogbolu, Y., Johantgen, M., Zhu, S., & Johnson, J. V. (2015). Nurse Reported Patient Safety in Low-Resource Settings: A cross-sectional study of MNCH nurses in Nigeria. *Applied Nursing Research*, 28(4), 341-346. doi:10.1016/j.apnr.2015.02.006
- O'Hara, M. A., Burke, D., Ditomassi, M., & Palan Lopez, R. (2019). Assessment of Millennial Nurses' Job Satisfaction and Professional Practice Environment. *J Nurs Adm*, 49(9), 411-417. doi:10.1097/nna.0000000000000777
- Park, J. H., Park, M. J., & Hwang, H. Y. (2019). Intention to leave among staff nurses in small- and medium-sized hospitals. *J Clin Nurs*, 28(9-10), 1856-1867. doi:10.1111/jocn.14802

- Park, S. H., Hanchett, M., & Ma, C. (2018). Practice Environment Characteristics Associated With Missed Nursing Care. *J Nurs Scholarsh*, 50(6), 722-730. doi:10.1111/jnu.12434
- Patrician, P. A. (2002). Multiple imputation for missing data†‡. *Research in Nursing & Health*, 25(1), 76-84. doi:10.1002/nur.10015
- Patrician, P. A., Loan, L. A., McCarthy, M. S., Swiger, P., Breckenridge-Sproat, S., Brosch, L. R., & Jennings, B. M. (2017). Twenty years of staffing, practice environment, and outcomes research in military nursing. *Nursing Outlook*, 65, S120-S129. doi:10.1016/j.outlook.2017.06.015
- Patrician, P. A., Shang, J., & Lake, E. T. (2010). Organizational determinants of work outcomes and quality care ratings among Army Medical Department registered nurses. *Research in Nursing & Health*, 33(2), 99-110. doi:10.1002/nur.20370
- Pereira Lima Silva, R., Gonçalves Meneguetti, M., Dias Castilho Siqueira, L., de Araújo, T. R., Auxiliadora-Martins, M., Mantovani Silva Andrade, L., & Laus, A. M. (2020). Omission of nursing care, professional practice environment and workload in intensive care units. *J Nurs Manag*. doi:10.1111/jonm.13005
- Povedano-Jimenez, M., Granados-Gamez, G., & Garcia-Caro, M. P. (2020). Work environment factors in coping with patient death among Spanish nurses: a cross-sectional survey. *Rev Lat Am Enfermagem*, 28, e3234. doi:10.1590/1518-8345.3279.3234
- Raju, D., Su, X., & Patrician, P. A. (2014). Using Item Response Theory Models to Evaluate the Practice Environment Scale. *Journal of Nursing Measurement*, 22(2), 323-341. doi:http://dx.doi.org/10.1891/1061-3749.22.2.323
- Raquel Panunto, M., & de Brito Guirardello, E. (2013). Professional nursing practice: environment and emotional exhaustion among intensive care nurses. *Revista Latino-Americana de Enfermagem (RLAE)*, 21(3), 765-772. doi:10.1590/S0104-11692013000300016
- Roche, M. A., Duffield, C., Friedman, S., Twigg, D., Dimitrelis, S., & Rowbotham, S. (2016). Changes to nurses' practice environment over time. *Journal of Nursing Management*, 24(5), 666-675. doi:10.1111/jonm.12371
- Rubin, D. B., & Rubin, D. B. (2009). *Multiple imputation for nonresponse in surveys*.
- Salas, E., Sims, D. E., & Burke, C. S. (2005). Is there a “Big Five” in Teamwork? *Small Group Research*, 36(5), 555-599. doi:10.1177/1046496405277134
- Santos Alves, D. F., Silva, D., & Brito Guirardello, E. (2017). Nursing practice environment, job outcomes and safety climate: a structural equation modelling analysis. *Journal of Nursing Management*, 25(1), 46-55. doi:10.1111/jonm.12427
- Schubert, M., Glass, T. R., Clarke, S. P., Aiken, L. H., Schaffert-Witvliet, B., Sloane, D. M., & De Geest, S. (2008). Rationaling of Nursing Care and Its Relationship to Patient Outcomes: The Swiss extension of the International Hospital Outcomes Study. *International Journal for Quality in Health Care*, 20(4), 227-237. doi:10.1093/intqhc/mzn017
- Shang, R. J., Friese, H. C., Wu, H. E., & Aiken, H. L. (2013). Nursing Practice Environment and Outcomes for Oncology Nursing. *Cancer Nursing*, 36(3), 206-212. doi:10.1097/NCC.0b013e31825e4293

- Shieh, G., & Jan, S.-L. (2015). Optimal sample size allocation for Welch's test in one-way heteroscedastic ANOVA. *Behavior Research Methods*, 47(2), 374-383. doi:10.3758/s13428-014-0477-8
- Sillero-Sillero, A., & Zabalegui, A. (2020). Analysis of the work environment and intention of perioperative nurses to quit work. *Rev Lat Am Enfermagem*, 28, e3256. doi:10.1590/1518-8345.3239.3256
- Slater, P., Roos, M., Eskola, S., McCormack, B., Hahtela, N., Kurjenluoma, K., & Suominen, T. (2020). Challenging and redesigning a new model to explain intention to leave nursing. *Scand J Caring Sci*. doi:10.1111/scs.12884
- Smith, J. G., Morin, K. H., & Lake, E. T. (2018). Association of the nurse work environment with nurse incivility in hospitals. *J Nurs Manag*, 26(2), 219-226. doi:10.1111/jonm.12537
- Smith, S., Lapkin, S., Sim, J., & Halcomb, E. (2020). Nursing care left undone, practice environment and perceived quality of care in small rural hospitals. *J Nurs Manag*. doi:10.1111/jonm.12975
- Sorra, J. S., & Dyer, N. (2010). Multilevel psychometric properties of the AHRQ hospital survey on patient safety culture. *BMC Health Serv Res*, 10(1), 199. doi:10.1186/1472-6963-10-199
- Sorra, J. S., Dyer, N., Sorra, J. S., & Dyer, N. (2010). Multilevel psychometric properties of the AHRQ hospital survey on patient safety culture. *BMC Health Services Research*, 10, 199-199. doi:10.1186/1472-6963-10-199
- Study Group on Human Factors. (1994). *Third report: organising for safety* (0 7176 0865 4). Retrieved from United Kingdom: http://inis.iaea.org/search/search.aspx?orig_q=RN:29011023
- Sullivan, G. M., & Artino, A. R. (2013). Analyzing and Interpreting Data From Likert-Type Scales. *Journal of graduate medical education*, 5(4), 541-542. doi:10.4300/jgme-5-4-18
- Swezey, R. W., Salas, E., Alluisi, E. A., Andrews, D. H., Baker, E. L., Bell, H. H., . . . Zaccaro, S. J. (1992). *Teams: Their training and performance*. Norwood, NJ: Ablex Publishing Corporation.
- Swiger, P. A., Loan, L. A., Raju, D., Breckenridge-Sproat, S. T., Miltner, R. S., & Patrician, P. A. (2018). Relationships between Army nursing practice environments and patient outcomes. *Research in Nursing & Health*, 41(2), 131-144. doi:10.1002/nur.21855
- Swiger, P. A., Loan, L. A., Raju, D., Breckenridge-Sproat, S. T., Miltner, R. S., & Patrician, P. A. (2018). Relationships between Army nursing practice environments and patient outcomes. *Research in Nursing & Health*, 1-14.
- Swiger, P. A., Patrician, P. A., Miltner, R. S., Raju, D., Breckenridge-Sproat, S., & Loan, L. A. (2017). The Practice Environment Scale of the Nursing Work Index: An updated review and recommendations for use. *International Journal of Nursing Studies*, 74, 76-84. doi:10.1016/j.ijnurstu.2017.06.003
- Swiger, P. A., Raju, D., Breckenridge-Sproat, S., & Patrician, P. A. (2017). Adaptation of the Practice Environment Scale for military nurses: a psychometric analysis. *Journal of Advanced Nursing*, 73(9), 2219-2236. doi:10.1111/jan.13276

- Tabakakis, C. K., McAllister, M., Bradshaw, J., & To, Q. G. (2019). Psychological resilience in New Zealand registered nurses: The role of workplace characteristics. *J Nurs Manag*, 27(7), 1351-1358. doi:10.1111/jonm.12815
- Tervo-Heikkinen, T., Kiviniemi, V., Partanen, P., & Vehviläinen-Julkunen, K. (2009). Nurse staffing levels and nursing outcomes: a Bayesian analysis of Finnish-registered nurse survey data. *Journal of Nursing Management*, 17(8), 986-993. doi:10.1111/j.1365-2834.2009.01020.x
- The Joint Commission. (2018). Primary Care Medical Home. Retrieved from <https://www.jointcommission.org/accreditation/pchi.aspx>
- Thomas-Hawkins, C., & Flynn, L. (2015). Patient Safety Culture and Nurse Reported Adverse Events in Outpatient Hemodialysis Units. *Research and Theory for Nursing Practice*, 29(1), 53-65. doi:10.1891/1541-6577.29.1.53
- Thomas-Hawkins, C., Flynn, L., Lindgren, T., & Weaver, S. (2015). Nurse Manager Safety Practices in Outpatient Hemodialysis Units. *Nephrology Nursing Journal*, 42(2), 125-147. Retrieved from <https://login.proxy.libraries.rutgers.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=c8h&AN=103796964&site=ehost-live>
- Topçu, İ., Türkmen, E., Badır, A., Göktepe, N., Miral, M., Albayrak, S., . . . Özcan, D. (2016). Relationship between nurses' practice environments and nursing outcomes in Turkey. *International Nursing Review*, 63(2), 242-249. doi:10.1111/inr.12247
- TriService Nursing Research Program. (2018). Research Priorities. Retrieved from <https://www.usuhs.edu/tsnrrp/research-priorities>
- U.S. Army Medical Command. (2014a). *ARMY PCMH Implementation Manual: Leaders guide to Army patient centered medical home transformation*. Retrieved from
- U.S. Army Medical Command. (2014b). *ARMY PCMH Operations Manual: Leaders guide to Army patient centered medical home*. Retrieved from
- Ursachi, G., Horodnic, I.A., Zait, A. (2015). How Reliable Army Measurement Scales? External factors with indirect influence on reliability estimators. *Procedia Economics and Finance*, 20, 679-686.
- Van Bogaert, P., Timmermans, O., Weeks, S. M., van Heusden, D., Wouters, K., & Franck, E. (2014). Nursing unit teams matter: Impact of unit-level nurse practice environment, nurse work characteristics, and burnout on nurse reported job outcomes, and quality of care, and patient adverse events--A cross-sectional survey. *International Journal of Nursing Studies*, 51(8), 1123-1134. doi:10.1016/j.ijnurstu.2013.12.009
- Van den Heede, K., Florquin, M., Bruyneel, L., Aiken, L., Diya, L., Lesaffre, E., & Sermeus, W. (2013). Effective strategies for nurse retention in acute hospitals: A mixed method study. *International Journal of Nursing Studies*, 50(2), 185-194. doi:10.1016/j.ijnurstu.2011.12.001
- VanFosson, C. A., Jones, T. L., & Yoder, L. H. (2018). Monthly variation of unfinished nursing care at the US Army Burn Center. *Burns*, 44(8), 1910-1919. doi:<https://doi.org/10.1016/j.burns.2018.03.008>
- von Hippel, P. T. (2018). How Many Imputations Do You Need? A Two-stage Calculation Using a Quadratic Rule. *Sociological methods & research*, 49(3), 004912411774730-004912411774718. doi:10.1177/0049124117747303

- Weaver, S. H., & Lindgren, T. G. (2017). Getting Safely Through the Shift: A qualitative exploration of the administrative supervisor role. *Journal of Nursing Management*, 25(6), 430-437. doi:10.1111/jonm.12481
- Wharton, A. (1993). The Affective Consequences of Service Work. *Work and Occupations*, 20, 205-232.
- White, E., Woodford, E., Britton, J., Newberry, L. W., & Pabico, C. (2020). Nursing practice environment and care quality in nursing homes. *Nurs Manage*, 51(6), 9-12. doi:10.1097/01.NUMA.0000662656.07901.a8
- Wisconsin Hospital Association. (2018). *Wisconsin Health Care Workforce Report*. Retrieved from https://www.wha.org/WisconsinHospitalAssociation/media/WHA-Reports/2018_Workforce_Report.pdf
- Wu, X., Hayter, M., Lee, A. J., Yuan, Y., Li, S., Bi, Y., . . . Zhang, Y. (2020). Positive spiritual climate supports transformational leadership as means to reduce nursing burnout and intent to leave. *J Nurs Manag*, 28(4), 804-813. doi:10.1111/jonm.12994
- Yan, P., Yang, Y., Zhang, L., Li, F., Huang, A., Wang, Y., . . . Yao, H. (2018). Correlation analysis between work-related musculoskeletal disorders and the nursing practice environment, quality of life, and social support in the nursing professionals. *Medicine (Baltimore)*, 97(9), e0026. doi:10.1097/md.00000000000010026
- Yurumezoglu, H. A., & Kocaman, G. (2016). Predictors of nurses' intentions to leave the organisation and the profession in Turkey. *Journal of Nursing Management*, 24(2), 235-243. doi:10.1111/jonm.12305
- Zander, B., Blümel, M., & Busse, R. (2013). Nurse migration in Europe--Can expectations really be met? Combining qualitative and quantitative data from Germany and eight of its destination and source countries. *International Journal of Nursing Studies*, 50(2), 210-218. doi:10.1016/j.ijnurstu.2012.11.017
- Zangaro, G. A., & Jones, K. (2019). Practice Environment Scale of the Nursing Work Index: A Reliability Generalization Meta-Analysis. *West J Nurs Res*, 41(11), 1658-1684. doi:10.1177/0193945918823779

Appendix A.

Evidence Table

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
Flynn, Thomas-Hawkins, & Clarke (2009)	Random selection of 422 nephrology nurses from 47 of the United States To investigate the effect of workload, practice environment, and care processes on burnout among nurses in U.S. chronic hemodialysis centers and to determine the association between burnout and nurses' intentions to leave their jobs	Cross-sectional, correlational design	The Nursing Organization and Outcomes Model Staffing – Nurse response to several items designed to calculate patient to RN ratios Workload – Individual Workload Perception Scale, 5 item Workload subscale Nursing Practice Environment – Practice Environment Scale of the Nursing Work Index (PES-NWI) Care Left Undone Occupational burnout – Maslach Burnout Inventory (MBI) Emotional Exhaustion (EE) subscale Intent to leave – Two single item measures (intent to leave current position and intent to leave current employer)	23.3% intent to leave related to workload 11.1% report intent to leave position within 12 months but stay with employer 8.2% report planning to leave their employer within 12 months Deletion of Adequacy subscale due to significant association with staffing measure. Practice Environment on burnout: 1) Unadjusted OR= 12.37 (5.90, 24.93), $p < .001$ 2) Adjusted OR= 4.60, (1.96, 10.78), $p < .01$ Burned out nurses and intent to leave (within 12 months) compared to not burned out nurses: 1) Position OR= 3.0 (1.7, 5.0), $p < .01$ 2) Employer OR= 2.7 (1.59, 5.86), $p < .01$ Findings support an additional relational proposition of the NOOM: process of care affects nurse outcomes Care left undone effect on burnout: 1) Unadjusted OR= 8.75 (4.5, 17.01), $p < .001$ 2) Adjusted

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				OR= 2.68 (1.17, 6.14), p<.05
Tervo-Heikkinen, Kiviniemi, Partanen, & Vehvilainen-Julkunen (2009)	162 bedside registered nurses working on 46 inpatient care units at 5 university hospitals in Finland To assess the relationship between patient to registered nurse ratio and nursing outcomes: job satisfaction and stress, nursing care quality, control of own practice, intent to leave, adequacy of material sources and attitudes toward technical equipment	Cross-sectional, correlational design using Bayesian network modeling	Theory not specified; utilization of Bayesian Network model to discover relationships RN Working Conditions Barometry form: Opportunity to influence at work – 10 items Stress and intent to leave – 7 items Quality of work – 5 items Material resources – 5 items Attitudes toward technical equipment – 4 items Staffing situation – 1 item Job satisfaction – 1 item Demographics - Age - Gender, - Experience - Specialty area, - Education Patient to RN ratio: number of patients assigned on last worked shift Quality of nursing care – 3 items: 1) Quality of care in the unit is extremely good (good, satisfactory, poor) 2) I am satisfied with my present job 3) I have felt stress (none, slight,	Confirmatory Factor Analysis of Variables demonstrated 5 subscales (Cronbach alpha): 1) RN assessed quality of care (0.630) 2) Control over practice (0.717) 3) Intent to leave (0.793) 4) Adequacy of material resources (0.744) 5) Attitudes toward technical equipment (0.619) Bayesian Model demonstrates a strong relationship between intent to leave and 1) care quality and 2) satisfaction; a moderate relationship between intent to leave and 3) control of own practice (autonomy)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
			some extent, significant, extreme)	
Aiken & Poghosyan (2009)	Wave 1: 859 nurses: Russia – 460 Armenia – 399 Wave 2: 803 nurses: Russia – 439 Armenia – 364 To provide an outcome-evaluation of an intervention to strengthen nursing practice in Russian and Armenian hospitals	Cross-sectional, quantitative description	Twinning partnership driven by the American Nurses Credentialing Center's Application for Magnet Designation “Research design was based on methods and measures used in the International Hospital Outcomes Study of five Western countries (Aiken, et al., 2002)” pp. 168 Nurse Practice Environment – Nursing Work Index-Revised (NWI-R) Burnout – MBI EE subscale Confidence in management's willingness to address problems in care – single item measure Quality of care – single item measure Readiness for discharge – single item measure	Chi square results to determine if changes within countries were significant: before implementation, after implementation 1) Participation - Russia a. Policy Decisions 50.0, 62.8 (p<.001) b. Hospital Governance 49.2, 54.8 - Armenia a. Policy Decisions 64.3, 72.0 (p<.05) b. Hospital Governance 67.1, 73.4 2) Manager - Russia a. Admin listens to RNs 65.0, 68.9 b. Support for ideas 47.3, 58.4 (p<.001) c. RN continuity of care 43.3, 50.2 (p<.05) - Armenia a. Admin listens to RNs 78.5, 85.5 (p<.05) b. Support for ideas 73.5, 77.9 c. RN continuity of care 77.3, 86.3 (p<.01) 3) Adequacy - Russia a. Enough RNs

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				63.9, 53.5 ($p < .05$) b. Enough staff 51.0, 46.3 c. Support services 64.4, 66.3 d. Satisfactory salary 16.1, 20.2 - Armenia a. Enough RNs 92.6, 89.5 b. Enough staff 92.8, 92.8 c. Support services 93.2, 93.9 d. Satisfactory salary 53.4, 53.1 4) Nurse Phy Rel - Russia a. Phy value RNs 67.0, 73.6 ($p < .05$) b. Collaborations 78.8, 89.9 ($p < .001$) c. Teamwork 83.9, 89.2 ($p < .05$) - Armenia d. Phy value RNs 82.6, 80.3 e. Collaborations 88.0, 91.2 f. Teamwork 85.8, 89.5 Change in intent to leave not reported; nurse burnout significantly higher on comparison units when compared with magnet units, before 19.1, after 14.1, $p < .001$
Aiken, Clarke, Sloane, Lake, & Cheney (2009)	10,184 nurses and 232, 342 surgical patients in 168	Cross- sectional, correlational design	Discussion of the Quality Health Outcomes Model and adapted conceptual model	PES-NWI Cronbach's alphas: 1) Foundation $\alpha =$.74 2) Manager $\alpha = .82$

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	Pennsylvania hospitals To analyze the net effects of nurse practice environments on nurse outcomes and patient outcomes after accounting for nurse staffing and education		RN Staffing – Mean number of patients assigned to staff nurses on their last shift) RN Education – Percentage of BSN or higher degree holders Patient Care Environment (3 subscales of the PES-NWI) - Nursing Foundations for Quality Care (NFQC) - Nurse Manager Ability, Leadership and Support for Nurses (NM) - Collegial Nurse Physician Relations (CNPR) RN Job satisfaction – Single item measure Burnout – MBI EE subscale Intent to leave (job within the next year) – Single item measure RN perception of quality care – Three item scale Surgical Patient Outcomes – Patient death within 30 days of admission - Failure to rescue Patient Characteristics: - Age - Sex	3) Nurse Phy Rel $\alpha = .80$ Hospital percentages by care environment: - Poor 26% - Mixed 49% - Better 25% Adjusted Odds Ratios for effect of Care Environment and Staffing on Nurse Outcomes (estimated separately): 1) Burnout - Care Env OR= 0.74 (0.68, 0.80), $p < .01$ - Staffing OR= 1.21 (1.11, 1.31), $p < .01$ 2) Job dissatisfaction - Care Env OR= 0.74 (0.67, 0.80), $p < .01$ - Staffing OR= 1.15 (1.06, 1.24), $p < .01$ 3) Intent to leave (1 yr) - Care Env OR= 0.87 (0.78, 0.96), $p < .01$ - Staffing OR= 1.05 (0.96, 1.14) 4) Quality of RN care - Care Env OR= 0.60 (0.53, 0.68), $p < .01$ - Staffing OR= 1.33 (1.23, 2.01), $p < .01$ 5) Confidence in Managers - Care Env OR= 0.62 (0.56, 0.68), $p < .01$ - Staffing OR= 1.16 (1.05, 1.29), $p < .001$

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
			- Transfer status - Emergent admission - 48 surgery types - 28 present or preexisting conditions	6) Confidence in patient mgt of care - Care Env OR= 0.74 (0.66-0.84), p<.01 - Staffing OR= 1.22 (1.09, 1.36), p<.01 7) Would not recommend hospital - Care Env OR= 0.55 (0.44, 0.68), p<.01 - Staffing OR= 1.26 (1.04, 1.52), p<.05 (estimated jointly): 1) Burnout - Care Env OR= 0.76 (0.70, 0.82), p<.01 - Staffing OR= 1.17 (1.09, 1.25), p<.01 2) Job dissatisfaction - Care Env OR= 0.75 (0.68, 0.81), p<.01 - Staffing OR= 1.11 (1.04, 1.18), p<.01 3) Intent to leave (1 yr) - Care Env OR= 0.87 (0.78, 0.96), p<.01 - Staffing OR= 1.03 (0.95, 1.12) 4) Quality of RN care - Care Env OR= 0.62 (0.55, 0.69), p<.01 - Staffing OR= 1.27 (1.16, 1.40), p<.01 5) Confidence in Managers - Care Env

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				OR= 0.63 (0.57, 0.68), $p<.01$ - Staffing OR= 1.11 (1.01, 1.21), $p<.05$ 6) Confidence in patient mgt of care - Care Env OR= 0.76 (0.68-0.86), $p<.01$ - Staffing OR= 1.18 (1.06, 1.31), $p<.01$ 7) Would not recommend hospital - Care Env OR= 0.56 (0.45, 0.70), $p<.01$ - Staffing OR= 1.19 (0.99, 1.43) Adjusted Odds ratios indicating effect of care environment on patient outcomes: 1) Mortality OR= 0.91 (0.85, 0.97), $p<.01$ 2) Failure to rescue OR= 0.91 (0.89, 0.98), $p<.01$ Estimated jointly with nurse education and staffing: 1) Mortality OR= 0.93 (0.87, 0.99) 2) Failure to rescue OR= 0.94 (0.88, 1.00), $p<.001$
Patrician, Shang, & Lake (2010)	955 registered nurses working on inpatient units in 23 U.S. based Army Medical Department Hospitals. Military 357, Civilian 598	Cross-sectional, correlational design	Nursing Organization and Outcomes Model referenced as the Aiken, et al. (1997) framework RN Demographics	27% of the sample report job dissatisfaction 30% report high emotional exhaustion - Military nurses report significantly more high emotional

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	Describe AMEDD RN practice environments; Examine levels of job dissatisfaction, emotional exhaustion, and job termination intentions among AMEDD RNs; Describe AMEDD RN assessed quality of care; Examine the contributions of nurse staffing and the practice environment for predicting RN work outcomes and RN-rated quality of care		Nursing Practice Environment – PES-NWI RN Job dissatisfaction – single item measure Emotional Exhaustion – MBI EE subscale Intent to leave – single item measure: if no military obligation of self or spouse, would you leave your current job; categorized as dichotomous) Fair/Poor quality of care – Single item measure	exhaustion scores than civilian counterparts 34% of the sample report intend to leave within one year (controlling for military and military spouse reassignments within and out of the hospital) 16% report fair to poor quality of care (agreement between military and civilian nurses) Strongest consistent predictor of RN work outcomes was an unfavorable practice environment; nurses reporting an unfavorable practice environment compared to a favorable practice environment were: - 14 times more likely to experience job dissatisfaction (13.75, $p<.001$) - 13 times more likely to experience emotional exhaustion (12.70, $p<.001$) - 3 times more likely to intend to leave within 1 year (3.03, $p<.001$) - 11 times more likely to report fair to poor quality of care (10.66, $p<.001$) Largest effect controlling for all other variables was for emotional exhaustion - BSN prepared nurses (1.97,

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				p<.001) were more likely than AD prepared nurses to experience to report high emotional exhaustion - Caucasian nurses were more likely than other racial groups to report high emotional exhaustion (1.53, p<.05) and fair to poor quality of care (.94, p<.05)
Cheng & Liou (2011)	195 Asian nurses working at least six months in United States Hospitals. Personal referrals and snowball sampling To measure the predictability of cultural orientation on organizational commitment, perception of practice environment, and intention to leave among Asian nurses working in US hospitals	Cross-sectional, correlational, and comparative design	Theory not specified: Mention to Mowday (1979) Organizational Commitment and to Lake (2002) Practice Environment Organizational Commitment – OC Questionnaire developed by Mowday, 1979 Practice Environment (PES-NWI) Intention to Leave – Anticipated Turnover Scale, ATS by Hinshaw and Atwood, 1985 Cultural Orientation – Collectivist Orientation Scale	Intention to leave was negatively correlated with years practiced at the current position (-.24, p<.05), years lived in the United States (-.23, p<.05), age (-.24, p<.05), organizational commitment (-.52, p<.001), practice environment (-.34, p<.001), and cultural orientation (-.24, p<.05) Regression: Cultural orientation was positively associated with: - Organizational commitment R²= 5.8%, B= 0.59, t= 3.34, p<.001 - Practice Environment R²= 3.9%, B=1.34, t= 2.69, p<.01 And negatively associated with - Intent to leave

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				$R^2 = 6.1\%$, $B = -.47$, $t = -3.35$, $p < .001$ Perception of the practice environment was correlated with: - Organizational commitment $R^2 = 3.5\%$, $B = 0.22$, $t = 10.39$, $p < .001$) - Intent to leave $R^2 = 6.7\%$, $B = -.07$, $t = -3.85$, $p < .001$) Organizational commitment was correlated with: - Intent to leave (controlling for cultural orientation and demographics) $R^2 = 19.3\%$, $B = -0.36$, $t = -7.12$, $p < .001$) Mediation: When organizational commitment and practice environment were entered into the regression analysis, practice environment did not have significant regression weight ($B = 0.01$, $t = 0.27$, $p = 0.79$) suggesting mediation effect of organizational commitment Organizational commitment mediated 93.98% of the practice environment effect on intent to leave (Sobel = -5.57, $p < .001$); this increased to 96.54% when controlling for cultural orientation (Sobel = -5.32, $p < .001$)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
Lin, Chiang, & Chen (2011)	535 Taiwanese nurses providing direct care to patients in Taiwanese hospitals To compare the difference between Taiwanese nurses' intent to leave or stay in employment in nursing as related to their perceptions of the practice environment	Cross-sectional, comparative design	Theory not specified; discussion of literature examining nursing work and practice environments Nurse Practice Environment – PES-NWI Chinese Version Intent to leave – Two single item measures 1. Nursing (single item: “do you frequently think of quitting nursing?”) 2. Employment (single item: “do you currently consider finding a nursing job in another hospital?”)	C-NPE association with intent to leave employment: mean (SD), t, p 3. Composite 2.6(0.4), t= 3.9, p<.001 4. Management 2.5(0.5), t= 2.7, p=.007 5. Prof Development 2.9(0.4), t= 4.2, p<.001 6. Quality 2.8(0.4), t= 2.5, p=.012 7. Adequacy 2.3(0.6), t= 4.4, p<.001 8. Participation 2.3(0.6), t=1.5, p= 0.145 C-NPE association with intent to leave nursing: mean (SD), t, and p 9. Composite 2.7(0.3), t= 36.0, p<.001 10. Management 2.6(0.5), t= 4.2, p<.001 11. Prof Development 3.0(0.3), t= 3.3, p<.001 12. Quality 2.7(0.4), t= 5.6, p<.001 13. Adequacy 2.4(0.6), t= 5.9, p<.001 14. Participation 2.3(0.6), t= 4.0, p<.001
Lavoie-Tremblay, Paquet, Marchionni, & Drevniok (2011)	145 new nurses in Quebec To investigate which domains of the nursing practice	Correlational, descriptive design	“This current study used the Practice Environment Scale of the Nursing Work Index (PES-NWI) as a framework for examining the work	ANOVA revealed no significant differences between generational categories on the PES-NWI

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	environment influence the intent to leave a job among generation Y nurses.		environment and how it influences turnover in Generation Y nurses.” Pp. 40 Sociodemographic variables: - <24 years (Gen Y) - 25-44 (Gen X) - Type of institution of current employment - Job title - Department - Employment status - Schedule Type - Work Environment – PES-NWI Intent to leave – Two single item measures 1. Employer (ANY intent; no timeframe) 2. Profession (ANY intent; no timeframe)	Point-biserial correlations between NURSING PRACTICE ENVIRONMENT and Intent to Quit 1) Participation a. Position -.17, p<.05 b. Profession -.19, p<.05 2) Foundation a. Position -.15, p<.05 b. Profession -.24, p<.01 3) Manager a. Position -.09 b. Profession -.24, p<.01 4) Adequacy a. Position -.09 b. Profession -.23, p<.01 5) Nurse Phy Rel a. Position -.16, p<.05 b. Profession -.16, p<.01 Chi square analyses between generation groups and the intent to quit categories revealed no statistically significant relationships
Hinno, Partanen, & Vevilainen-Julkunen (2012)	Random sample of 869 hospital nurses from Finland and the Netherlands Nurses: Finland 535 Netherlands 334 To investigate the relationship between nurse work environment characteristics	Cross-sectional, correlational comparative survey	Theory not specified; discussion of nurse work environment and nurse practice environment literature from USA, Canada, Australia, and several European countries. Practice Environment – NWI-R translated and back-translated into Dutch	Cronbach alpha for modified NWI-R 1) Adequacy 0.85 2) Support of management 0.86 3) Assurance of care quality 0.77 Professional practice environment of RN comparison between countries 1) Finland 3. Adequacy 2.32(0.47)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	and nurse-reported outcomes in hospital settings in Finland and the Netherlands		Nurse job-related feelings – Single item measure (positive/negative) Intent to Leave – Two single item measures 1. Current Unit (ANY intent; no timeframe) 2. Organization (ANY intent; no timeframe) Care Quality – Single item measure (improvement on the unit over last year)	4. Support of mgnt 2.43(0.50) 5. Quality 3.13(0.37) 2) The Netherlands 6. Adequacy 2.76(0.38) 7. Support of mgnt 2.56(0.40) 8. Quality 2.76(0.37) Regression: 9. Job-related negative feelings 1) Adequacy a. Finland OR=24.617 (6.196, 97.806), p<0.5 b. Netherlands OR=3.174 (1.301, 7.742), p<.05 10. Job-related positive feelings 1) Adequacy a. Finland OR=4.108 (2.652, 6.361), p<.05 2) Support a. Finland OR=1.668 (1.082, 2.554), p<.05 11. Intention to leave the unit 1) Adequacy a. Finland OR=0.353 (0.230, 0.541), p<.05 2) Support a. Finland 0.499 (0.329, 0.576), p<.05 b. Netherlands OR=0.523 (0.315, 0.898), p<.05 12. Intention to leave the Organization

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				1) Adequacy a. Finland OR=0.510 (0.334, 0.778), p<.05 b. Netherlands OR=0.268 (0.138, 0.520), p<.05 2) Support a. Finland OR=0.530 (0.354, 0.794), p<.05 13. Intention to leave the profession 1) Adequacy a. Finland OR=0.426 (0.279, 0.651), p<.05 b. Netherlands OR=0.418 (0.217, 0.807), p<.05 2) Support a. Finland OR=0.426 (0.285, 0.635), p<.05 b. Netherlands OR=0.464 (0.278, 0.776), p<.05 14. Quality of care in the unit is high 1) Adequacy a. Finland OR=5.644 (1.631, 19.527), p<.05 b. Netherlands OR=4.885 (2.475, 9.639), p<.05 2) Quality a. Finland OR=12.466 (4.748, 32.730), p<.05 15. Quality of care is improved in last year

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				1) Adequacy a. Finland OR=4.330 (2.741, 6.840), p<.05 b. Netherlands OR=4.749 (2.498, 9.029), p<.05 2) Support a. Netherlands OR=2.889 (1.639, 5.091), p<.05 3) Quality a. Finland OR=3.673 (1.040, 12.970), p<.05
Liu, You, Chen, Hao, Zhu, Zhang, & Aiken (2012)	1,104 RNs in 89 medical, surgical, and intensive care units in 21 hospitals across Guangdong province in China; stratified convenience sample To examine the relationship between hospital work environments and job satisfaction, job-related burnout and intention to leave among nurses in Guangdong province, China	Cross-sectional, correlational design	Nursing Organization and Outcomes Model referenced as the Aiken, et al. (1997) framework Nurse characteristics Hospital characteristics Unit characteristics Work Environment – (PES-NWI) Job satisfaction – Single item measure Burnout – MBI EE subscale Intention to leave – Single item measure (within the next year)	Adjusted odds ratios for unit work environment on: 1) Burnout OR= 0.673, 95%CI, p=.006 2) Job dissatisfaction OR= 0.501, 95%CI, p<.001 3) Retention OR= 0.599, 95%CI, p=0.053 (adjused for gender, age, marital status, having children under the age of eighteen, registered or not, employment status, working years, and education level)
Fuentelsaz-Gallego, Moreno-Casbas, & Gonzalez-Maria (2013)	Nurses working on medical surgical and critical care units in 33 randomly selected Spanish National Health	Psychometric Study	Practice Environment Scale of the Nursing Work Index for translation to Spanish Version of the Practice Environment Scale	Questionnaire translated to Spanish by two translators with a degree in translation and previous experience in written or oral translation in

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	Service (SNHS) Hospitals with more than 150 beds To evaluate the validity and reliability of the Spanish version of the Practice Environment Scale of the Nursing Work Index, determining the content validity, test-retest reliability, internal consistency, and construct validity		Favorable (4 to 5 subscales > 2.5) Mixed (2 to 3 subscales > 2.5) Unfavorable (0 to 1 subscale > 2.5) Burnout – MBI Spanish version Job Satisfaction – Single item measure Intent to leave – Single item measure	the field of healthcare and nursing Spanish version back-translation to American English performed by two additional translators with the same qualifications All four versions (one from each translator) reviewed for inconsistencies and edited to remain as close as possible to the original version in American English. No discrepancies Internal consistency: Cronbach's alpha Composite = 0.90 1) Participation 0.81 2) Foundation 0.73 3) Manager 0.81 4) Adequacy 0.78 5) Nurse Phy Rel 0.77 Test-retest reliability: 384 surveys paired; Intraclass Correlation Coefficient = 0.87 (0.85, 0.90) 1) Participation 0.88 (0.85, 0.90) 2) Foundation 0.85 (0.82, 0.88) 3) Manager 0.87 (0.86, 0.91) 4) Adequacy 0.82 (0.78, 0.85) 5) Nurse Phy Rel 0.88 (0.85, 0.90) Kappa Index for each item ranges from 0.24-0.51 (agreement of score of each item in test-retest)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				Content Validity: No discrepancies 16. 10 hospital RNs with broad clinical experience, fluent in English and Spanish, and experience in the SNHS within 5 years asked: 1) Ease of understanding 2) Adapted to Spanish cultural context 3) Capable of measuring the concepts in Spain it was designed to measure in the US 17. Provided three-column document with American English and Spanish version side-by-side and an additional column for comments 18. Same nurses performed a second review to assess the relevance of each item on a scale of 1-4 19. Content Validity Index: 5 items attain maximum level of agreement; all items range 0.5-1.0; 4 items below 0.8 1. Chief nursing officer equivalent to other top-level

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				executives (0.7) 2. Written up-to-date care plans for all patients (0.7) 3. Use of nursing diagnoses (0.6) Construct Validity: 1) Better NPE=higher job satisfaction $X^2=727.84$, $df=6$, $p<.001$ 2) Better NPE=lower burnout $X^2=183.30$, $df=4$, $p<.001$ 3) Poor NPE=intent to leave No statistically significant differences were found between the composite score and intent to leave within the next year as a result of job dissatisfaction
Blake, Leach, Robbins, Pike, & Needleman (2013)	Convenience sample of 415 critical care pediatric RNs working at least 6 months on 10 pediatric intensive care units having greater than 10 beds and critical care medicine fellowship programs Examine the effects of the healthy work environment (communication, collaboration, and leadership) on RN turnover	Descriptive, cross-sectional, correlational design	American Association of Critical Care Nurses' 6 Standard of a Healthy Work Environment Hospital and unit data: - Nursing leadership structure - Medical leadership structure - Physician staffing and availability - Hospital type - Unit type - Magnet status - Beacon unit status - Union representation - Patient days	Intent to leave correlated with leadership, management subscale of the PES-NWI (-0.117, $p<.05$) and years of experience as an RN (-0.134, $p<.01$) Model 3 statistically significant, $p<.01$ ($R^2=0.034$) 20. Leadership (manager subscale of PES-NWI) 21. Communication timeliness 22. Years of experience as an RN Inverse relationship between PES-NWI

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	from data collected from a research study		- Nursing hours per patient day (HPPD) RN Demographics - Age - Sex - Education - Experience in nursing - Experience in pediatric intensive care nursing Healthy Work Environment – PES-NWI Communication – 22 items from the ICU Nurse Physician Communication Questionnaire by Shortell et al., 1991 Intent to leave – Single item measure, “do you intend to leave your job in the next six months?”	manager subscale and intent to leave -0.196, SE=0.088, t=-2.241, p=.026 Model 4 statistically significant, $p<.05$ ($R^2=0.069$) 23. Communication 24. Collaboration 25. Leadership 26. Years of experience as an RN 27. Highest level of education 28. Age 29. Magnet designation 30. HPPD 31. Manager responsible for one unit Inverse relationship between PES-NWI Manager subscale and intent to leave -0.287, SE=0.108, t=-2.649, p=.008) Results listed in the table do not match the results reported in the narrative: Table for Model 4: F= 0.069, $R^2= 0.022$ Therefore, only 2% of the variance in intent to leave was explained by this model. Table for Model 3: F=0.034, $R^2= 0.003$ Therefore, only .3% of the variance in intent to leave was explained by this model. Also, models 1 and 2 which were rejected due to lack of significance explain 12.2% and 11.6% of the variation in intent to leave, respectively;

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				PES-NWI manager subscale remains a significant predictor across the models
Choi, Cheung, & Pang (2013)	1,259 RNs working in 135 inpatient units in 10 public hospitals in Hong Kong To examine how the front-line registered nurses' perception of their work environment associates with and predicts nurse outcomes in terms of job satisfaction and turnover intention	Cross-sectional, correlational design with psychometric testing	Theory not specified; discussion included concerning the Magnet body of research and the development of several nursing work and practice environment measures Work Environment – Researcher-developed measure of 72 items across 5 subscales - Staffing and resources 13 - Management 11 - Co-worker relationship 12 - Ward Practice 22 - Professionalism 14 Job satisfaction – Single item measure Intent to leave – Single item measure (dichotomous single item: have or have not thought about resigning from work)	Spearman correlation between job satisfaction and intent to leave: -0.465, $p < .001$ 45% of respondents report dissatisfaction 60% report intent to leave Work environment significantly correlated with: 1) Job satisfaction (Pearson) 0.516, $p < .001$ 2) Intent to leave (Spearman) -0.399, $p < .001$ Logistic regression adjusted for age, gender, education, experience as RN, unit tenure, and hospital type: 1) Job satisfaction 32. Ward Practice OR=2.27 (1.78, 2.89), $p < .001$ 33. Staffing and resources OR=1.71 (1.22, 2.39), $p < .01$ 34. Management OR=2.44 (1.49, 4.00), $p < .001$ 35. Professionalism OR=3.29 (2.36, 4.58), $p < .001$ 2) Intent to leave 36. Ward Practice OR=0.58 (0.46, 0.72), $p < .001$ 37. Management

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				OR=0.37 (0.23, 0.60), $p<.001$ 38. Professionalism OR=0.36 (0.27, 0.49), $p<.001$
Raquel Panunto & de Brito Guirardello (2013)	129 nurses working on critical care units in 17 public, private, and philanthropic hospitals across the interior of San Paulo, Brazil To evaluate the characteristics of the professional nursing practice environment and its relationship with burnout, perception of quality of care, job satisfaction, and the intention to leave the job in the next 12 months	Cross-sectional, Structural Equation Modeling using Path Analysis	Nursing practice environment – NWI-R Brazilian version Burnout – Brazilian MBI Job satisfaction – Single item measure Intent to leave – Single item measure (in the next 12 months)	NWI-R means and standard deviations: - Autonomy 2.2(0.62) - Control 2.4(0.60) - Nurse Phy Rel 2.1(0.66) - Org Support 2.2(0.52) Analysis of correlations between NWI and MBI with outcomes resulted in an RMSEA=0.9 above the acceptable limit of 0.8 New model considered only Emotional Exhaustion (EE) domain of burnout with NWI and outcomes yielded an RMSEA=0.0 and estimation of the coefficients revealed paths were significant. Autonomy to EE 0.21 Control to EE 0.33 Nurse Phy Rel 0.04 EE to Quality care - 0.44 EE to Job satisfaction 1.08 EE to Intent to leave - 0.57
Van den Heede, Florquin, Bruyneel, Aiken, Diya, Lesaffre,	3,186 bedside nurses on 272 randomly selected nursing units in 56 Belgian acute hospitals	Mixed Methods: Cross-sectional, Sequential explanatory	Theory not specified; American Nurses Credentialing Center Forces of Magnetism: are the basis for the in-depth qualitative interviews with CNOs	PES-NWI composite score average (SD): 2.56 (0.14) Generalized Estimating Models:

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
Sermeus (2013)	To examine the impact of nursing practice environments, nurse staffing, and nurse education on nurse reported intention to leave the hospital		Staffing – Nurse to patient ratio Education – Percent of nurses holding a BSN Nursing work environment – PES-NWI Intent to Leave – Single item measure (if possible, would you leave your job within the next year)	Effect on intent to leave, 39. Age OR=0.98 (.95,1.00), p<.05 40. Gender (not significant) 41. Experience (not significant) 42. Bed Size OR=1.05 (1.02, 1.07), p<.05 43. Teaching status (not significant) 44. High tech (not significant) 45. Region: Walloon v Flanders OR=1.69 (1.20, 2.40), p<.05 Brussels v Flanders OR=1.53 (1.22, 1.94), p<.05 46. NPE OR=0.69 (0.61, 0.78), p<.0001 47. Staffing OR=1.08 (1.01, 1.16), p<.05 48. Education (not significant) 6 Flemish hospitals selected for in-depth interviews with Chief Nursing Officers presented with the findings from the larger parent study (3 high performing and 3 low performing); 5 Themes extracted- 1) Transformational Leadership Visible leaders, rounding often, listening to staff, highly involved, first-hand information, respectful

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				2) Structural Empowerment Involvement of nurses in hospital affairs, flat management structure, expect staff feedback Low performance CNOs and management perform themselves on committees rather than nurses High performers have a plan for filling vacancies Low performance hospitals poorly manage staffing; temp agency nurses v. nurses on fulltime status Professional development opportunity differed No difference in salary, flexible work schedules, days off, sick days, or education leave 3) Exemplary Professional Practice Medical models rather than nursing models utilized across the sample High performers still satisfied with autonomy Low- doctor autonomy values over nurse autonomy 4) Innovations and Improvements

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				High- value life long learning (nurse satisfaction 89%) Low- believe education removes staff from the ward increasing the burden on other nurses (nurse satisfaction 66%) High possess preceptorship Low expect nurses to hit the ground running 5) Empirical Outcomes: CNOs discuss quality care outcomes from larger study revealing higher scores for quality care in high performing hospitals regarding intent to leave Perception of quality of care: High 93% Low 65% Nurses would recommend hospital: 95% 67% High believe nurses are modest and this is a solid report Low admit patient safety is not the focus of attention and their approach is retroactive rather than proactive
Zander, Blumel, & Busse (2013)	27,451 nurses from 328 hospitals:	Mixed Methods:	Theory not specified; reference to work environment literature	Review of secondary qualitative data from previous study in 17

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	Germany United Kingdom (UK) Netherlands (NL) Sweden (SE) Norway (NO) Switzerland (CH) Poland (PO) Greece (GR) South Africa (ZA) To test whether the combination of qualitative and quantitative data on motives to migrates and to leave the current hospital, respectively, provides sufficient information 1) to analyze working conditions in Germany compared to five destination and three source countries, 2) to verify or falsify the assumption that working conditions in destination countries are better than in source countries, and 3) to identify sound strategies for workforce planning.	Cross-sectional, Sequential Exploratory	examining the Nursing Practice Environment in European countries RN Characteristics: - Age - Gender Perceived staffing shortage – PES-NWI composite High emotional exhaustion – MBI EE subscale Decision making power – Single item from the PES-NWI Recognition – Single item from the PES-NWI Collaboration between nurses and physicians – Single item from the PES-NWI Work environment – Single item measure Satisfaction with remuneration – Single item measure Advanced training opportunities – Single item measure Intent to Leave – Single item measure (the hospital)	European countries (nurse responses via online survey, two focus groups, and 20 standardized telephone interviews) to extrapolate motives for nurses to migrate to and from Germany: eight “push factors” identified. Log regression results for push factor effect on intent to leave: 1) Poor work environment OR=3.235 (2.434, 4.301), p<.001 2) EE OR=2.445 (1.860, 3.215), p<.001 3) Low recognition OR=1.796 (1.299, 2.407), p<.001 4) Poor advanced training prospects OR=1.686 (1.278, 2.225), p<.001 5) Lack of collaboration between physicians and nurses OR=1.647 (1.265, 2.145), p<.001 6) Perceived staffing shortage OR=1.553 (1.048, 2.302), p=.028 Low remuneration and restricted decision-making power were not significant predictors of nurse intent to leave.

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
Gabriel, Erickson, Moran, Diefendorff, & Bromley (2013)	699 full-time RNs representing 79 units across 9 branches of a Midwestern hospital system To examine the extent to which four of the PES-NWI subscales have homologous or emergent effects across different levels of analysis	Cross-sectional, multilevel analysis	Theory not specified. Nurse Practice Environment – PES-NWI subscales - NPHA - NM - SRA - CNPR Emotional exhaustion – Wharton’s seven item emotional exhaustion scale Job Satisfaction – Five items adapted from Quinn and Staines, 1979 Turnover intentions – Three single item measures - Job within the next year - Employer within the next year - Profession within the next year	Emotional Exhaustion: 1) Participation 49. Individual (-.24, $p<.05$) 50. Unit (not significant) 51. Homologous? No 2) Adequacy 52. Individual (-.70, $p<.001$) 53. Unit (-.84, $p<.001$) 54. Homologous? Yes 3) Manager 55. Individual (not significant) 56. Unit (not significant) 57. Homologous? Yes 4) Nurse Phy Rel 58. Individual (not significant) 59. Unit (not significant) 60. Homologous? Yes Turnover Intentions: 1) Participation 61. Individual (-.30, $p<.001$) 62. Unit (not significant) 63. Homologous? No 2) Adequacy 64. Individual (-.10, $p<.05$) 65. Unit (-.16, $p<.05$) 66. Homologous? Yes 3) Manager 67. Individual (-.17, $p<.001$) 68. Unit (-.19, $p<.05$) 69. Homologous? Yes 4) Nurse Phy Rel

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				70. Individual (not significant) 71. Unit (-.16, $p<.05$) 72. Homologous? No Job Satisfaction: 1) Participation 73. Individual (.15, $p<.001$) 74. Unit (not significant) 75. Homologous? No 2) Adequacy 76. Individual (.27, $p<.001$) 77. Unit (.24, $p<.001$) 78. Homologous? Yes 3) Manager 79. Individual (.15, $p<.001$) 80. Unit (.18, $p<.05$) 81. Homologous? Yes 4) Nurse Phy Rel 82. Individual (.14, $p<.001$) 83. Unit (.16, $p<.05$) 84. Homologous? Yes
Shang, Friese, Wu, and Aiken (2013)	4,047 nurses working in 282 hospitals in 3 states To examine the differences in outcomes such as job dissatisfaction and burnout between oncology nurses and medical surgical nurses, and to identify factors that affect	Cross-sectional, correlational design examining secondary data	“Aiken and colleagues developed a conceptual framework that outlines the relationship between organizational forms, nursing operational mechanisms, and outcomes.” Pp 207 RN Characteristics Organizational support for nursing – PES-NWI Burnout –	PES-NWI subscale means and standard deviations: 1) Participation 85. Oncology 2.68(0.66) 86. Med-Surg 2.64(0.66) 2) Foundation 87. Oncology 3.07(0.55) 88. Med-Surge 3.02(0.54) 3) Manager 89. Oncology 2.61(0.82)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	oncology nurse outcomes		MBI EE subscale Job dissatisfaction – Single item measure Intent to leave – Single item measure (ANY intent; no timeframe) Nurse assessed quality of care – Single item measure	90. Med-Surg 2.62(0.79) 4) Adequacy 91. Oncology 2.46(0.82) 92. Med-Surg 2.37(0.77) 5) Nurse Phy Rel 93. Oncology 2.88(0.69) 94. Med-Surg 2.83(0.67) Unfavorable 28.5(34.8) Mixed 21.1(22.7) Favorable 50.4(42.5) Logistic regression (controlling for patient to nurse ratios): 1) Emotional Exhaustion 95. Mixed a. Onc (not significant) b. M/S (not significant) 96. Favorable a. Onc 0.31 (0.19, 0.51), p<.001 b. M/S 0.50 (0.32, 0.79), p<.001 2) Job dissatisfaction 97. Mixed a. Onc (not significant) b. M/S (not significant) 98. Favorable a. Onc 0.24 (0.13, 0.43), p<.001 b. M/S 0.40 (0.23, 0.68), p<.01 3) Intent to leave 99. Mixed a. Onc (not significant)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				b. M/S (not significant) 100.Favorable a. Onc (not significant) b. M/S (not significant) 4) Quality of care 101.Mixed a. Onc 0.51 (0.31, 0.85), p<.01 b. M/S 0.59 (0.37, 0.96), p<.05 102.Favorable a. Onc 0.29 (0.16, 0.51), p<.001 b. M/S 0.32 (0.18-0.57), p<.001
Van Bogaert, Timmermans, Mace Weeks, van Heusden, Wouters, & Franck (2014)	1,108 nurses assigned to 96 nursing units across Belgium To investigate the impact of nurse practice environment factors, nurse work characteristics, and burnout on nurse reported job outcomes, quality of care, and patient adverse events at the unit level	Cross-sectional, correlational design	Theory not specified; thorough discussion of the state of the science concerning nurse practice environments Nurse Work Environment – NWI- R RN Demographics Workload – Intensity of labor scale by Richter, 2000 Decision latitude – Seven item measure by Richter, 2000 Social capital – Six item scale by Ernstmann et al., 2009 Burnout – MBI Human Services Survey	Simple Multilevel Models Nurse practice environment associated with all outcome variables, adjusted and unadjusted for all confounders, except for: 103.the associations between nurse physician relations and management at the unit level and patient and family verbal abuse 104.between nurse management at the unit level, nurse-physician relations, and personal accomplishment with patient falls 105.association between nurse management at

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
			Nurse job satisfaction – Single item measure (with current job) Intent to leave – Single item measure (the profession within a year) Adverse patient events: - Patient and family complaints - Patient and family verbal abuse - Patient falls - Nosocomial infections - Medication errors	the unit level, and nosocomial infections 106.association between personal accomplishment and medication errors Multilevel Multivariate Analyses 1) Satisfaction with current job a. Nurse man. Unit level Adjusted: OR=4.79 (2.16, 10.65), $p<.001$ Unadjusted: OR=7.95 (3.72, 17.00), $p<.001$ b. EE Adjusted: OR=0.52 (0.43, 0.66), $p<.001$ Unadjusted: OR=0.54 (0.44, 0.66), $p<.001$ 2) No intent to leave profession a. Nurse man. Unit level Adjusted: OR=2.26 (1.03, 4.96), $p<.05$ Unadjusted: OR=2.41 (1.15, 5.08), $p<.05$ b. EE Adjusted: OR=0.63 (0.51, 0.79), $p<.001$ Unadjusted: OR=0.67 (0.55, 0.82), $p<.001$ c. Personal accomplishment Adjusted: OR=1.57 (1.16, 2.14), $p<.01$ Unadjusted: OR=1.46 (1.11, 1.93), $p<.01$

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				3) Quality of care on unit a. Nurse man. Unit level Adjusted: OR=15.18 (5.39, 42.71), $p<.001$ Unadjusted: OR=15.11 (5.61, 40.72), $p<.001$ b. Social capital Adjusted: OR=8.86 (4.49, 17.50), $p<.001$ Unadjusted: OR=8.13 (4.26, 15.54), $p<.001$ 4) Quality of care last shift a. Nurse man. Unit level Adjusted: OR=8.67 (3.18, 23.67), $p<.001$ Unadjusted: OR=8.83 (3.26, 23.93), $p<.001$ b. Social capital Adjusted: OR=3.79 (2.04, 7.05), $p<.001$ Unadjusted: OR=3.91 (2.12, 7.21), $p<.001$ c. Personal accomplishment Adjusted: OR=1.45 (1.07, 1.97), $p<.05$ Unadjusted: OR=1.48 (1.10, 2.01), $p<.05$ 5) Quality of care hospital (1yr) a. Nurse man. Unit level Adjusted: OR=8.99 (4.08, 19.81), $p<.001$ Unadjusted: OR=10.22 (4.58, 22.82), $p<.001$

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				b. Hosp. msn and org. support Adjusted: OR=4.62 (2.25, 9.47), $p<.001$ Unadjusted: OR=4.30 (2.11, 8.78), $p<.01$ c. Workload Adjusted: OR=0.50 (0.33, 0.75), $p<.001$ Unadjusted: OR=0.51 (0.34, 0.77), $p<.05$ 6) Patient/Family complaints a. Hosp. man. and org. support Adjusted: OR=0.45 (0.26, 0.77), $p<.01$ Unadjusted: OR=0.43 (0.25, 0.73), $p<.01$ b. Depersonalization Adjusted: OR= 2.24 (1.81, 2.77), $p<.001$ Unadjusted: OR=2.31 (1.88, 2.85), $p<.001$ 7) Patient/Family verbal abuse a. EE Adjusted: OR=1.40 (1.19,1.65), $p<.001$ Unadjusted: OR=1.38 (1.17, 1.61), $p<.001$ b. Depersonalization Adjusted: OR=1.43 (1.16, 1.77), $p<.01$ Unadjusted: OR=1.48 (1.20, 1.81), $p<.001$ 8) Patient Falls

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				a. Depersonalization Adjusted: OR=1.40 (1.15, 1.71), $p<.01$ Unadjusted: OR=1.40 (1.16, 1.69), $p<.001$ 9) Nosocomial Infections a. Nurse phy relations Adjusted: OR=0.62 (0.44, 0.68), $p<.01$ Unadjusted: OR=0.65 (0.47, 0.92), $p<.05$ b. Depersonalization Adjusted: OR=1.53 (1.28, 1.83), $p<.001$ Unadjusted: OR=1.56 (1.31, 1.86), $p<.001$ 10) Medication errors a. Social capital Adjusted: OR=0.69 (0.49, 0.98), $p<.05$ Unadjusted: OR=0.69 (0.49, 0.97), $p<.05$ b. Depersonalization Adjusted: OR=1.58 (0.49, 0.98), $p<.001$ Unadjusted: OR=1.58 (1.33, 1.88), $p<.001$
Lee, Kang, Yoon, & Kim (2014)	Random sample of 3,096 nurses working on 185 general inpatient wards in 60 hospitals across South Korea	Cross-sectional, correlational design	Appears atheoretical: thorough discussion of the development and use of the NWI and NWI-revised Hospital variables – - Type - Ownership	KGU-NWI 1) Participation in the decision-making process 2) Nurse staffing adequacy 3) Education to improve quality of care

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	To examine whether the nursing practice environment at the hospital level affects the job satisfaction and turnover intentions of hospital nurses		- Bed to nurse ratio - Korean General Inpatient Unit data on the Work Environment – KGU-NWI Demographics - Gender - Age - Education - Position - Years of experience - Department Job satisfaction - Single item measure Turnover intention – Single item measure (are you planning to leave your current job within the next year?)	4) Organizational support and management of the hospital 5) Doctor-nurse relationship 6) Nursing process Multilevel logistic Regression significant predictors, odds ratio, coefficient, p: Fixed Effect- 1) Participation Not significant 2) Nursing Process a. Job satisfaction 107.Hospital OR=4.21, 1.44, p=.004 108.Nurses OR=2.30, 0.83, p<.001 b. Intent to leave 109.Nurses OR=1.24, 0.21, p=.03 3) Staffing a. Job satisfaction 110.Hospital OR=4.09, 1.41, p<.001 111.Nurse OR=1.57, 0.45, p<.001 b. Turnover intention Not significant 4) Education Not significant 5) Org. Support a. Job satisfaction 112.Nurse OR=1.47, 0.39, p=.003 b. Turnover intention 113.Nurse OR=1.77, 0.57, p<.001

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				6) MD-RN a. Job satisfaction 114.Hospital OR=4.15, 1.42, p=.03 115.Nurse OR=2.04, 0.71, p<.001 b. Turnover intention 116.Nurse OR=1.42, 0.35, p=.002 Random Effect 1) Job satisfaction a. Model 1 0.18 (8741.05), p<.05 b. Model 2 0.22 (7787.45), p<.05 c. Model 3 0.03 (7305.94), p<.001 2) Intent to leave a. Model 1 0.34 (8531.58), p<.05 b. Model 2 0.29 (7615.57), p<.05 c. Model 3 0.33 (7225.66), p<.05 Null hypotheses rejected; however, result of model 3 compared to 2 suggest nursing practice environment is not a significant predictor of the variation in job satisfaction compared to intent to leave
Kutney-Lee, Stimpfel, Sloane, Cimiotto,	136 Pennsylvania hospitals (11 emerging	Retrospective two-stage panel design examining	American Nurses Credentialing Center Forces of Magnetism	Changes in PES-NWI in Magnet and non- Magnet hospitals from 1999-2006:

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
Quinn, & Aiken (2015)	Magnet and 125 non-Magnet To compare changes over time in surgical patient outcomes, nurse reported quality, and nurse outcomes in a sample of hospitals that attained Magnet status between 1999 and 2007 with hospitals that remained non-Magnet	secondary data (random sampling)	Nurse Work Environment – PES-NWI Nurse-reported Quality of Care – - Overall (single item) - Confidence in patient's ability to manage care post-discharge (single item) - Confidence that management would act to resolve reported patient care problems (single item) Job dissatisfaction – Single item measure Burnout – MBI EE subscale Intentions to leave – Single item measure (employer in the next year) Hospital characteristics – - Teaching status - Technology status - Bed size RN Characteristics – - Education - Staffing Patient Characteristics - Surgery type - 20-85 years old Patient Outcomes - 30-day surgical mortality - Failure to rescue	1) Participation a. Magnet +0.52 b. Non-magnet +0.09 c. Absolute difference 0.43, $p<.001$ 2) Foundation a. Magnet +0.19 b. Non-magnet -0.01 c. Absolute difference 0.20, $p<.001$ 3) Manager a. Magnet +0.24 b. Non-Magnet -0.01 c. Absolute difference 0.25, $p=.01$ 4) Adequacy a. Magnet +0.34 b. Non-magnet +0.18 c. Absolute difference 0.16, $p=.06$ 5) Nurse Phy Rel a. Magnet +0.21 b. Non-Magnet +0.06 c. Absolute difference 0.15, $p=.01$ Adjusted Mean Outcome Rate A. 1999 1) Magnet Intent to leave 24.75 2) Non-Magnet Intent to leave 21.65, $p=.05$ B. 2006 1) Magnet

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				Intent to leave 8.86 2) Non-Magnet Intent to leave 13.40, $p < .01$ Regression Coefficient for Change in Intent to leave associated with Magnet designation (Magnet vs. non-Magnet) Intent to leave - Adjusted -6.79(1.41), $p < .001$ - Unadjusted -6.06(1.50), $p < .001$ Adjusted model includes nurse age, sex, full-time status, and unit type. Weighted (likely to account for a violation of heteroscedasticity)
Flinkman & Salantera (2015)	15 registered nurses under the age of thirty recruited in Finland; purposive sampling of nurses who left an organization within the past year To describe why young registered nurses had previously left an organization and why they intend to leave the profession	Qualitative description	In-depth, individual interviews; semi-structured with open-ended questions Conventional content analysis (Hsieh & Shannon, 2005) Codes inductively derived from the data (Elo & Kyngas, 2007). Eight steps of analysis: 1) Transcription 2) Reading 3) Analytic summaries 4) Coding (ATLAS.ti software) 5) Coding review	Poor practice environment: - Ethical problems in their work - Poor quality of care related to busy wards and staffing shortages - Moral stress and not wanting to be part of an association providing poor quality of care - Physically and mentally demanding work - Work pressures; described as assembly line work, uncontrollable, strenuous, and unreasonable

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
			6) Clustering categories 7) Clustering themes 8) Selection of quotes Trustworthiness: - Credibility (thematic interviews performed by a researcher familiar with the context of the nurses' practice environment) - Dependability (detailing data analyses and providing direct citations; translation to English performed with translator to ensure accuracy/context) - Conformity (consistency of the analyses through author meetings: discussion and consensus) - Transferability (description of the context, demographics of participants, data and process of analysis, all openly provided)	- Reports of verbal abuse from physicians and patients - Physical abuse reported from patients - One nurse stated that she resigned because she was exhausted; moved to casual worker schedule for quality of life - Two nurses had taken sick leave due to burnout and fatigue - Work caused disruption in family life causing problems at home - Nursing described as repetitive and a dead-end job - Work did not promote use of their skills or knowledge, provide career advancement, or professional development - Powerless to change their unsatisfactory work environments - Nursing shortage provided an opportunity to choose your workplace Lack of Support, orientation, and mentoring - Inadequate orientation; feelings of uncertainty, a sense of abandonment, fear they would

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				make a fatal mistake - Expected to take on a great deal of responsibility leading to insecurity and anxiety, fear of making errors - Not supported: “thrown into the deep end” - “If you fail, no one will stand by you.” - Yearn for support from colleagues and managers - Inadequate practical skills and knowledge upon graduation to perform in the workplace - Behavior and attitudes of managers closest to the RNs greatly impacted their job satisfaction and intention to leave - Nurse directors and managers distant - Bureaucratic environment, rushed; leadership did not understand practical nursing work Nursing as a ‘second best’ or serendipitous career choice - Compromise career: second best, serendipity, drifted, unintentional describe becoming a nurse

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				- Choice when not accepted to university - Financial reasons or because it was “easy to get in” - Some preferred nursing due to a strong desire to care and nurture - Two worked previously as nurse aids or licensed practical nurses - Having other nurses in their families also impacted their decision
Topcu, Turkman, Badir, Goktepe, Miral, Albayrak, Kebapci, Serbest, & Ozcan (2016)	2,592 nurses in 20 Ministry of Health and 29 private hospitals in Istanbul, Turkey To understand nursing practice environment characteristics in Istanbul-area hospitals in Turkey and the relationship between these characteristics and nursing outcomes in Turkey	Cross-sectional, correlational design	Appears atheoretical: mention of healthy work environments as those of Magnet designated facilities by the American Nurses’ Credentialing Center Practice Environment – PES-NWI Turkish version Burnout – MBI -Turkish Demographic questionnaire collected sociodemographic characteristics, workplace characteristics Intention to leave – Single item measure (job within one year)	NPE mean and standard deviation; classification: 1. Participation 2.50 (0.47) 2. Foundation 2.49 (0.58) 3. Manager 2.77(0.50) 4. Adequacy 2.06 (0.64) 5. Nurse Phy Rel 2.67 (0.60) Favorable 36% (22 private and 3 government hospitals) Mixed 42.8% (7 private and 10 government hospitals) Unfavorable 21.2% (7 government hospitals) Stepwise backward logistic regression: EE a. PES-NWI Adjusted

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				3.81(3.21, 4.51), $p<.001$ Unadjusted 3.74 (3.16, 4.43), $p<.001$ Depersonalization a. PES-NWI Adjusted 2.3 (1.93, 2.74), $p<.001$ Unadjusted 2.26 (1.90, 2.70), $p<.001$ b. Work years Adjusted 1.41 (1.19, 1.67), $p<.001$ Unadjusted 1.36 (1.15, 1.60), $p<.001$ Personal Accomplishment a. PES-NWI Adjusted 2.14 (1.82, 2.52), $p<.001$ Unadjusted 2.15 (1.83, 2.52), $p<.001$ b. Gender Adjusted 1.49 (1.18, 1.88), $p<.01$ Unadjusted 1.36 (1.08, 1.71), $p<.01$ c. Experience <10yr Adjusted 1.32 (1.12, 1.55), $p<.01$ Unadjusted 1.36 (1.17, 1.60), $p<.001$ Intention to Leave a. High EE Adjusted 1.91 (1.59, 2.29), $p<.001$ Unadjusted 2.00(1.69-2.36), $p<.001$

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				b. High depersonalization Adjusted 1.43 (1.20, 1.71), $p<.001$ Unadjusted 1.57 (1.34, 1.86), $p<.001$ c. Permanent position Adjusted 0.52 (0.43, 0.63), $p<.001$ Unadjusted 0.51 (0.43, 0.61), $p<.001$ d. PES-NWI Adjusted 1.26 (1.04, 1.51), $p<.05$ Unadjusted 1.44 (1.22, 1.70), $p<.05$ e. Special work unit Adjusted 1.19 (1.00, 1.41), $p<.05$ Unadjusted 1.18 (1.00, 1.40), $p<.05$
Goh & Lopez (2016b)	Stratified random sampling of 814 international nurses registered with the Singapore Nursing Board To examine the acculturation level of international nurse working in a multi-cultural society	Cross-sectional, correlational design	Conceptual model built on findings from international qualitative acculturation research in nursing Demographics ASASFN (12 item acculturation measure) Practice environment – PES-NWI-Revised (to include technology subscale) World Health Organization (WHO)	Acculturation score $\alpha=0.84$, 32.94(6.88): Malaysian $\alpha=0.88$, 35.81(7.72) Filipino $\alpha=0.78$, 34.26(5.42) Chinese $\alpha=0.81$, 27.47(5.23) India Nationals $\alpha=0.84$, 32.05(7.04) Myanmar Nationals $\alpha=0.80$, 32.43(6.42) Other $\alpha=0.92$, 35.09(9.44)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
			Quality of Life BREF (26 item questionnaire assessing 4 domains) - Physical - Psychological - Social relationship - Environment	Correlations between work environment and acculturation: Negative correlation between acculturation and participation in hospital affairs $r = -.111, n = 793, p < .01$ Negative correlation between acculturation and nursing information technology $r = -.097, n = 814, p < .01$ Remaining subscales of PES-NWI-R demonstrate a negative correlation with acculturation, however, results were not significant Lower level of acculturation associated with lower reported perception of the nurse work environment among international nurses
Roche, Duffield, Friedman, Twigg, Dimitelis, & Rowbotham (2016)	Six acute care hospitals across three Australian states To examine changes in the nursing practice environment, retention-related factors, unit stability, and patient care tasks delayed or left undone over two	Descriptive secondary data analysis	Patient Care Delivery Model (PCDM) “Inputs” Unit characteristics Nurse characteristics “Throughputs” Staffing Skill mix Workload Practice Environment “Outputs” Nurse outcomes	PES-NWI mean and standard deviation (a.) wave 1 and (b.) wave 2: 1) Participation a. 2.7(0.52) b. 2.6(0.58) 2) Foundation a. 3.1(0.44) b. 3.0(0.50) 3) Manager a. 3.0(0.61) b. 2.9(0.65) 4) Adequacy a. 2.4(0.70) b. 2.4(0.68)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	periods between 2004-2013		- Unit instability (being forced to change jobs in the last 12 months, including forced job loss related to restructuring) - Job satisfaction - Intent to leave (ANY intent to leave current job; no timeframe)	5) Nurse Phy Rel a. 2.9(0.57) b. 2.8(0.60) 6) Composite a. 2.8(0.45) b. 2.7(0.50) Difference between waves: 1) Participation t = 2.345, df=1345.04, p=.02 2) Foundation t = 3.637, df=1253.6, p<.01 3) Manager t = 4.098, df=1442.7, p<.01 4) Adequacy 1.305, df=1577, p=.19 5) Nurse Phy Rel t = 2.015, df=1450.2, p=.04 6) Composite t = 3.423, df=1412.6, p<.01 Nurse outcomes, (a.) wave 1 and (b.) wave 2: 1) Unit instability a. 19% b. 28.3% 2) Job Satisfaction a. 84% b. 94.2% 3) Intent to leave a. 24.8% b. 19.5% Difference between waves $\chi^2(df)$, p: 1) Unit instability 18.7(1), p<.01 2) Job Satisfaction 30.271(1), p<.01 3) Intent to leave 6.306(1), p=.01

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
Numminen, Ruoppa, Leino-Kilpo, Isoaho, Hupli, & Meretoja (Numminen et al., 2016)	318 newly graduated Finnish registered nurses To explore newly graduated nurses' perception of their practice environment and its' association with their self-assessed competence, turnover intentions, and job satisfaction	Cross-sectional, descriptive correlation design	Theory not specified; discussion of nurse practice environment and related concepts Practice Environment – PES-NWI Nurse Competence – 73 item Nurse Competence Scale by Meretoja et al., 2004 Professional competence Job Satisfaction – Four single item measures: - Satisfaction with orientation - Satisfaction with current job - Satisfaction with quality of care - Satisfaction with nursing profession Intent to leave – Two single item measures - Current job (single item measure) - Nursing profession (single item)	Turnover intentions: 117. Changing current job a. Very/fairly often 33.3% b. Never/fairly seldom 65.1 118. Changing profession a. Very/fairly often 14.2% b. Never/fairly seldom 84.3% Job satisfaction Orientation 65.4% Current job 83% Quality of care 80.5% Nursing profession 86.5% PES-NWI Cronbach alphas: 1) Participation $\alpha=0.846$ 2) Foundation $\alpha=0.769$ 3) Manager $\alpha=0.853$ 4) Adequacy $\alpha=0.846$ 5) Nurse Phy Rel $\alpha=0.848$ Association between NPE and level of competence: 1) Participation a. High 2.7 b. Low 2.5 c. Manova, 0.012, $F=6.73$, $p<.05$ 2) Composite a. High 2.8 b. Low 2.6 c. Manova, 0.0005, $F=7.95$, $p<.05$ Main effects of analysis of variance model, adjusted:

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				New graduate nurses who assessed their competence as high, never or seldom intended to leave their job or the profession, were satisfied with the quality of care in their unit and who were satisfied with their orientation had a more positive perception of their practice environment.
Goh & Lopez (2016b)	Stratified random sample of 495 migrant nurses working in a tertiary public hospital in Singapore To explore the job satisfaction level of migrant nurses working in a multicultural society and, more specifically, the relationship between their job satisfaction levels, work environment, their intentions to leave and the predictors of their intentions to leave	Cross-sectional, correlational design	Integration of the Push-pull theory of migration and Herzberg's (1987) two-factor theory Job Satisfaction – Job Satisfaction Questionnaire (JSQ) Work Environment – PES-NWI-Revised Demographic sheet: 119. Age - Gender - Citizenship - Religion - Marital status - Highest nursing qualification - Work experience in other countries - Nursing experience - Nursing practice environment - Nursing ranks - Intentions to leave (ANY intention, so timeframe) - Living arrangements	Mean difference for migrant nurses between intention to leave and the dimensions of the JSQ: Pay and benefits Mean diff = - 0.255 (-0.381, - 0.129), $p < .05$ Support Mean diff = - 0.154 (-0.274, - 0.033), $p < .05$ Autonomy and professional Mean diff = - 0.190 (-0.325, - 0.054), $p < .05$ Scheduling Mean diff = - 0.250 (-0.397, - 0.102), $p < .05$ Relationship and interaction Mean diff = - 0.212 (-0.329, - 0.094), $p < .05$ Logistic regression analysis of intention to leave (controlling for age, gender, citizenship, marital status, religion, nursing qualification,

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				work experience out of Singapore, years of experience, PES foundation, and JSQ_Dimen3) 1) Nursing practice environment (unit type) OR=0.876 (0.791, 0.970), p=.011 2) PES Manager OR=1.152 (1.008, 1.316), p=.037
Friese, Siefert, Thomas-Frost, Walker, & Ponte (2016)	319 registered nurses and nurse practitioners working in ambulatory oncology settings across the Dana Farber Cancer Institute To examine nurse-reported outcomes throughout the institution; to examine how the practice environment of registered	Cross-sectional, descriptive design	Theory not specified; discussion of research concerning nursing practice environments, the America Nurses Credentialing Center Magnet recognition program, and the National Database of Nursing Quality Indicators. Quality of care – Single item measure Intention to leave – Single item measure Job satisfaction – Single item measure Safety Organizing - Safety Organizing Scale subscale “behaviors theorized to support a safety culture and actions to improve patient safety”, 9 items) Practice environment – PES-NWI revised for ambulatory oncology settings Demographics	Intent to stay in current position 120.No plan to leave 77.4% 121.Within 6 months 2.2% 122.Within 1 year 6% 123.Not reported 14.4% Unfortunately, regression analysis utilized intention to stay operationalized as nurses reporting no plan to leave their current position. Intent to stay was significantly predicted by: 1) Manager OR=0.52 (0.28, 1.00), p=.05 2) Participation OR=6.38 (2.04, 19.93), p<.001 3) Nurse Phy Rel OR=1.83 (1.25, 2.67), p<.001

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
			- Years of experience - Education preparation - Certifications - Gender - Direct care or not - Role (RN or NP) - Workload (number of patients to whom nurses provided care on their last shift)	
Arslan Yurumezoglu & Kocaman (2016)	799 nurses in 16 hospitals across the seven regions of Turkey To examine the predictors of nurses' intentions to leave the organization and intention to leave the profession in Turkey	Cross-sectional, descriptive design	Theory not specified: thorough discussion of the literature surrounding nurses' intent to leave in recent literature General job satisfaction – Single item measure (overall how satisfied are you with your job?) Intention to leave – Two single item measures (organization and the profession) Burnout – MBI Turkish Work Environment – PES-NWI Turkish	PES means and standard deviations: 1) Participation 2.49 (0.64) 2) Foundation 2.70 (0.59) 3) Manager 2.50 (0.70) 4) Adequacy 1.98 (0.75) 5) Nurse Phy Rel 2.70 (0.71) ITL Organization a. Yes 64.4% b. No 35.6% ITL Profession a. Yes 51.1% b. No 48.9% Logistic regression model controlling for years worked at organization, dissatisfied, emotional exhaustion, and depersonalization: 1) Intent to leave organization a. Adequacy $\beta=-0.446$ (0.172), $p=.010$ b. Nurse Phy Rel $\beta=-0.483$ (0.198), $p=.015$

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
Nantsupawat, Kunaviktikul, Nantsupawat, Wichaikhum, Thienthong, & Poghosyan (2017)	Stratified and purposive sample of 1,351 nurses working in 43 inpatient units in five university hospitals across Thailand To investigate how work environment affects job dissatisfaction, burnout, and intention to leave among nurses in Thailand	Cross-sectional, correlational study	Quality Health Outcomes Model Nurse Practice Environment – PES-NWI RN job dissatisfaction RN turnover RN burnout – MBI EE subscale	Work environments classified as: Best: 16 units (37.21%) Mixed: 20 units (46.51%) Poor: 7 units (16.28%) Nursing foundations for Quality of Care subscale had the highest mean score (3.23, SD=0.13) and Staffing and Resource Adequacy had the lowest mean (2.56, SD=0.31) Adjusted models: A. odds of nurses reporting job dissatisfaction, intention to leave, and emotional exhaustion were lower for nurses working in best work environments compared to mixed environments B. 39-55% lower rate of emotional exhaustion in best work environment compared to poor work environment
Santos Alves, De Silva, & De Brito Guirardello (2017)	267 professional nurses working in two pediatric hospitals in Brazil To assess correlations between the characteristics of the nursing practice environment, job	Cross-sectional, Partial Least Square Structural Equation Modeling	Figure presents the theoretical model utilized for this study; unnamed. Nurse practice environment – NWI-R Brazilian Burnout – MBI EE subscale Safety Climate –	Structural model: path coefficients 1) Nurse practice environment (autonomy) a. Path coefficient 0.91 b. Student's t 85.143 2) Nurse practice environment (control over practice)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	outcomes, and safety climate		Safety Attitudes Questionnaire- short form Job satisfaction – Five single item measures Intention to leave – Single item measure (Do you intend to leave your current job in the next 12 months?) Demographics: - Age - Gender - Education - Length of professional experience - Time working on current unit/at current institution - Weekly working hours	a. Path coefficient 0.89 b. Student's t 46.466 3) Nurse practice environment (nurse physician relations) a. Path coefficient 0.79 b. Student's t 27.548 4) Nurse practice environment (EE) a. Path coefficient 0.53 b. Student's t 11.624 5) Nurse practice environment (safety climate) a. Path coefficient 0.43 b. Student's t 7.940 6) Nurse practice environment (job satisfaction) a. Path coefficient 0.38 b. Student's t 6.222 7) Nurses practice environment (intention to leave) a. Path coefficient 0.23 b. Student's t 3.397 All analyses resulted in a significant relationship ($p < .001$)
Gasparino & De Brito Guirardello (2017)	209 nurses working in Brazil with at least 3-month experience providing direct patient care	Cross-sectional, Psychometric study	Validity tested via Confirmatory Factor Analysis using Structural Equation Modeling examining correlations between the Brazilian PES-	Brazilian PES Cronbach's alphas: 1) Participation $\alpha=0.87$ 2) Foundation $\alpha=0.83$ 3) Manager $\alpha=0.87$

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	To validate the Brazilian version of the Practice Environment Scale		NWI and the following: Burnout – MBI Job satisfaction Safety climate – Safety attitudes questionnaire subscale Intent to leave – Single item measure (current job within the next year)	4) Adequacy $\alpha=0.83$ 5) Nurse Phy Rel $\alpha=0.76$ Spearman's correlation with the Brazilian PES-NWI: 1) Intent to leave Participation -.33, $p<.001$ Foundation -.32, $p<.001$ Manager -.30, $p<.001$ Adequacy -.21, $p<.007$ Nurse Phy Rel -.18, $p<.007$ 2) Job satisfaction Participation 0.49, $p<.001$ Foundation 0.43, $p<.001$ Manager -0.51, $p<.001$ Adequacy 0.47, $p<.001$ Nurse Phy Rel 0.44, $p<.001$ 3) Burnout a. Emotional Exhaustion Participation -0.40, $p<.001$ Foundation -0.37, $p<.001$ Manager -0.41, $p<.001$ Adequacy -0.48, $p<.001$ Nurse Phy Rel -0.36, $p<.001$ b. Depersonalization Participation -0.29, $p<.001$ Foundation -0.26, $p<.001$ Manager -0.32, $p<.001$ Adequacy -0.30, $p<.001$ Nurse Phy Rel

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				-0.32, $p < .001$ c. Personal accomplishment (reduced) Participation 0.40, $p < .001$ Foundation 0.38, $p < .001$ Manager 0.38, $p < .001$ Adequacy 0.32, $p < .001$ Nurse Phy Rel 0.39, $p < .001$ 4) Safety climate Participation 0.59, $p < .001$ Foundation 0.60, $p < .001$ Manager 0.40, $p < .001$ Adequacy 0.44, $p < .001$ Nurse Phy Rel 0.44, $p < .001$ 5) Perception of quality Participation 0.29, $p < .001$ Foundation 0.51, $p < .001$ Manager 0.40, $p < .001$ Adequacy 0.51, $p < .001$ Nurse Phy Rel 0.35, $p < .001$
Hiler, Hickman, Peimer, & Wilson (2018)	Convenience sample of 328 critical care nurses across the United States with at least one year of experience in adult intensive care. To explore the relationships among the severity of moral	Cross-sectional, descriptive correlational design	“Guided by a transactional model of stress and coping” pp. 60 Moral Distress – Moral Distress Scale – Revised Practice Environment – PES-NWI Demographics – - Age - Sex	Intent to leave: Yes 73% No 27% Unfortunately, intent to leave was not included in the stepwise regression analyses: Step 2 can explain 30% of the variance in moral distress; - Participation -0.038, not significant

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	distress, the practice environment, and patient safety		- Race - Years in practice - Years in critical care - Years on current unit - Type of unit - Education - Geographic location - AACN Beacon unit or not - Magnet status Level of job satisfaction – Single item measure Intent to leave current position – Single item measure (have you contemplated leaving your job in the past 6 months?)	- Foundation -0.121, not significant - Manager -0.001, not significant - Adequacy -0.185, p=.003 - Nurse Phy Rel -0.181, p=.001 - Beacon -0.031, not significant - Age -0.139, p=.001 - Job satisfaction -0.215, p<.001
Yan, Yang, Zhang, Li, Huang, Wang, Dai, & Yao (2018)	Cluster sampling of 1,973 nurses in 12 hospitals in the south middle, east, and north regions of the Xinjiang Uygur Autonomous region; 79.52% reporting work-related musculoskeletal disorders (WMSDs) To analyze the correlated influential factors between work related musculoskeletal disorders and nursing practice environment and quality of life	Cross-sectional, correlational design	Theory not specified Practice Environment – PES-NWI Chinese version Nordic Musculoskeletal Questionnaire MOS 36-item Short Form Health Survey Social Support Rating Scale (self-designed) Demographics - Age - Gender - Working duration - Education - Working institution and department - Shift - BMI	Statistically significant risk factors for WMSDs: 1. Age greater than 26 years 2. working in the Department of Surgery, Critical Care, Outpatient department, Anesthesia 3. Working duration greater than 40 hours per week Statistically significant protective factors for WMSDs: 1. Physiological function 2. Body pain 3. Total health condition 4. PES adequate staff and

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	and social support			resources subscale 5. Social support
Nelson-Brantley, Park, & Bergquist-Beringer, (2018a)	1002 adult care units in 162 NDNQI participating hospitals To examine characteristics of the nursing practice environment associated with lower RN turnover	Secondary analysis of data; cross-sectional correlational design	Theory not specified Nursing Practice Environment, Practice Environment Scale of the Nursing Work Index RN turnover – Nurses leaving their job for any reason Hospital characteristics - Magnet status - Hospital size - Ownership - Teaching status - Unit characteristics - Case mix index - Unit type	10% of the variance in RN turnover explained by hospital and unit characteristics (Hospital ownership, case mix index, unit mean RN age, tenure, and education) Annual RN turnover decreased 14.8% for every unit increase on PES-NWI composite Government-owned hospitals had a significantly lower rate of RN turnover ($\beta = -0.09 [-0.15, -0.02]$, $p < .01$) RN turnover increased 13.9% with every unit increase in case mix index 4 of the 5 PES-NWI subscales accounted for 4% of the variance in RN turnover controlling for hospital and unit characteristics: Every unit increase in Staffing and Resource adequacy decreased turnover 14.8%; every unit increase in Nurse Manager subscale RN turnover increase 8.3%
Smith, Morin, & Lake, (2018)	233 nurses working in a southwestern United States health system To determine whether nurse coworker	Cross-sectional, correlational design	Donabedian's structure-process-outcome model Practice Environment Scale of the Nursing Work Index (structure)	Positive nurse work environment perceptions were inversely correlated with incivility; Both subscales were inversely related with incivility; nurse manager ability,

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	incivility is associated with the nurse work environment, defined as organizational characteristics that promote nurse autonomy		Workplace Incivility Scale (process) Demographics: - Age - Gender - Unit specialty - Education level - Employment status - Years of experience	leadership, and support for nurses remained significant in a joint model
Cho & Han, (2018)	432 nurses working on 57 units in five hospitals in South Korea To determine the relationships among the unit-level nursing work environment and individual-level health-promoting behaviors of hospital nurses in South Korea and their perceived nursing performance quality	Cross-sectional, correlational design	Person Environment Occupation Performance Model Demographics - Age - Gender - Marital status - Education - Experience - Work schedule - Work unit - Position Nursing performance quality – Six Dimension Scale of Nursing Performance Korean Nursing Work Environment – PES-NWI Korean Health Promoting Behaviors – Health Promoting Lifestyle Profile II Korean	Respondents working in units with higher NM reported greater health responsibility and physical activity Nurses reporting higher SRA report better stress management Nurses reporting higher CNPR reported higher likelihood to practice healthy eating Higher SRA more likely to perceive higher nursing performance Greater inner resources for pursuing goals and active sense of accountability for personal health associated with better nursing task performance Controlling for demographics, relationships between health promoting behaviors and perceived nursing performance were strengthened; the relationships between SRA were weakened

Author (Year)	Sample/Purpose	Study Type/Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
Park, Hanchett, & Ma (2018)	31,650 RNs working on 1,583 units in 371 hospitals in the US To examine which characteristics of the practice environment were associated with missed care in US acute care hospital units	Descriptive, correlational study analyzing secondary data	Discussion of Magnet and Nursing Practice Environment literature; theory not specified Practice Environment – PES-NWI Missed Nursing Care – 16 essential care activities for acute care Hospital and unit characteristics - Size - Teaching status - Location - Magnet status - Case mix index - Unit type	Care activities missed differed by poor, moderate, and good practice environments significantly ($p < .001$) Average: 88.9% of nurses missed at least one care activity in poor environments; 76% in good environments and 85.2% in moderate environments ($\chi^2(2,1,583) = 190.04, p < .001$) 81.5% [1.156, 0.220] lower missed care for every unit increase in SRA 21.9% [0.622, 0.981] lower missed care for every unit increase in CNPR 2.1 times [1.465, 2.957] higher missed care for every unit increase in NPHA 63.3% [0.335, 0.425] lower missed care in good environments compared to poor Moderate environments 36.7% [0.568, 0.705] less missed care compared to poor
Knupp, Patterson, Ford, Zurmehly, & Patrick, (2018)	175 NICU nurses working in 5 NICUS in the Midwestern US To examine the relationships among nurse fatigue, individual nurse	Cross-sectional, correlational design	The Systems Engineering Initiative for Patient Safety Model Nurse characteristics - Age - Experience - Experience in NICU	Experience and NICU experience demonstrated correlations with nurse age and were removed from further analysis Contributors to nurse fatigue:

Author (Year)	Sample/Purpose	Study Type/Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	factors, and the practice environment in the inpatient setting		- Education - Shift length - Hours of sleep - Caffeine consumption - Additional employment - Current or recent life experiences - Physical contributions to fatigue - Mental contributions to fatigue - Recent distressing patient events Nurse Fatigue – Checklist Individual Strength Questionnaire Practice Environment – Practice Environment Scale of the Nursing Work Index	Number of hours worked each shift the last two weeks ($t = 2.30, p < .05$) Number of hours of sleep in each 24-hour period before shift ($t = -2.10, p < .05$) Current physical or mental contributor ($t = 3.61, p < .001$) Recent distressing patient event ($t = 2.13, p < .05$) NM associated with fatigue ($t = -2.02, p < .05$) SRA and CNPR were not significantly associated with fatigue Individual factors accounted for 20.1% of the variance in nurse fatigue ($F(11,62) = 3.71, p < .001$) Addition or primary independent variables increased explanation in nurse fatigue by 8.2% ($F(3,159) = 6.06, p < .01$), for a total of 28.3 % of the variance in fatigue
Lumillo-Gutierrez, Romero-Sanchez, D'Agostino, Paramio-Cuevas, Fabrellas, Moreno-Corral, & Paloma-Castro, (2019)	239 nurses working in the Catalan primary health care system in Catalonia region of Spain To identify clusters of nurses in relation to the utilization and attitudes towards nursing	Cross-sectional, descriptive design	Theory not specified Demographics - Age - Gender - Experience - Field - Postgraduate training Frequency of nursing diagnoses use – Single item measure	Attitude toward ND clustered by negative, neutral, and positive Respondents belonging to each cluster differed by aggregate ($\Lambda = 0.104$; $F = 551.008$; $p < .001$) and on each PND item ($p < .05$) Clusters of ND use were low, medium,

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	diagnoses and to compare their profiles considering demographics, professional characteristics, and nurse practice environments		Position on nursing diagnoses – Single item measure Practice Environment – PES-NWI Spanish	and high. Higher utilization attained higher PND scores and higher attitudes toward ND with significant differences between clusters ($p < .001$) Nurses with greater experience ($\chi^2 (2) = 6.69, p = .035$) or in management ($\chi^2 (2) = 6.92, p = .031$) demonstrated greater utilization Higher PES scores associated with higher utilization ($\chi^2 (2) = 6.76, p = .034$) and positive attitudes ($\chi^2 (2) = 13.41, p < .001$) Similar findings for NPHA and NFQC, and for NM only with attitudes No differences between clusters for SRA or CNPR
Change, Lee, Change, & Wang, (2019)	696 nurses working in three teaching hospitals in Taiwan To determine the influence of work excitement, workplace violence, and the violence prevention climate on professional commitment and turnover intention	Cross-sectional, correlational design	Discussion of Professional commitment; Theory not specified Demographics Workplace Violence Experience – Workplace Violence Experience Checklist Professional Commitment – The Professional Commitment Scale Work Excitement – Work Excitement Scale	Professional commitment had negative effect on turnover intention: Work ethic ($\beta = -.336, p < .001$) Willingness to stay ($\beta = -.448, p < .001$) Professional value ($\beta = -.134, p < .001$) Job challenge and variety have a mediating effect on the relationship between professional commitment and turnover intention; both variables significantly reduce turnover intention

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
			Violence Prevention Climate – Violence Prevention Climate Scale Turnover intention – Employee’s Turnover Intentions and Job Destination Choices Scale	As nurses witness others suffering from workplace violence, the effect of professional commitment on turnover intention diminishes; others’ experiences moderate the relationship between professional commitment and turnover intention Personal experience of workplace violence moderates the relationship between professional commitment and turnover intention
Khan, Jackson, Stayt, & Walthall, (2019)	341 psychiatric nurses working on 43 clinical units in 2 psychiatric hospitals in Beijing, China To explore factors that may influence nurses’ intentions to leave adult critical care areas	Cross-sectional, descriptive design	Discussion of nurse work environment literature; theory not specified Demographic characteristics Work Environment – Practice Environment Scale of the Nursing Work Index Chinese Work Engagement – Utrecht Work Engagement Scale, 9 item Chinese Nurse Quality of Care – single item measure Turnover Intention - Turnover Intention Scale Chinese	Structural Equation Modeling: Practice environment demonstrated direct effects on: Quality of care ($\beta = 0.498, p < .05$) Turnover ($\beta = -0.394, p < .05$) Work engagement partially mediated the effects of the practice environment on: Quality of care ($\beta = 0.096, p < .05$) Turnover ($\beta = -0.296, p < 0.05$) This model explained 36% of the variance in quality of care and 56% of the variance in turnover intention
Park, Park, & Hwang (2019)	951 staff nurses working in small and medium sized hospitals in South Korea	Cross-sectional, correlational design	Foundational theory not specified; ERG theory informed benefits and intention to leave hospital	The strongest predictor of intention to leave hospital was lower pay satisfaction ($\beta = .037, p < .001$)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	To explore the factors associated with the intention to leave among nurses in small- and medium-sized hospitals and to determine the predictors about work environment and rewards		Work Environment variables - Form of employment - Department - Mean working hours per week for the last month - Mean number of night shifts per month for the last month - Mean consecutive days of night shift for the last month - Number of patients per nurse in the last department - Reward variables - Pay satisfaction scale adapted - Benefits satisfaction (Korean language benefits scale) Nurses intention to leave the hospital – Six item scale	Pay satisfaction had a statistically significant interaction with hospital size ($\beta = 0.16$, $p = .04$) Nurses perceive a greater imbalance between pay and effort in smaller hospitals (< 250 beds) compared to medium hospitals ($\geq$ 250 beds)
Lasater, Sloane, McHugh, and Aiken, (2019)	12, 870 registered nurses working in 491 US hospitals in California, Florida, New Jersey, and Pennsylvania To describe the quality of end of life care in US hospitals from the perspective of hospital nurses and to evaluate the relationship between the nurse practice environment and end of life care	Cross-sectional, correlational design	Not specified, however, data used from the RN4CAST study which utilized the NOOM AHRQ PSCS overall patient safety grade Likert scale of specific quality measures Practice Environment Scale of the Nursing Work Index Demographics - Age - Sex - Years of experience	Poor end of life care was associated with poor practice environments; nurses in hospitals with poor practice environments reported poorer end of life care No significant differences in quality between hospitals by teaching status, technology status, or size For profit hospitals had significantly higher percentage of nurses reporting unfavorable grades and lower quality compared with not for

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
			- Education - Specialty certification - Working in an ICU - Frequency providing end of life care Hospital characteristics: - Size - Teaching status - Technology status - Profit status	profit and government nonfederal hospitals, but this association did not remain significant in multivariate models
Hallowell, Rogowski, & Lake, (2019)	6060 Registered nurses working in 104 NICUS and providing care for 15,233 infants To examine the relationship between the NICU work environment and parental presence in the NICU using a national data set	Cross-sectional, correlational design	Theory not specified Practice Environment – PES-NWI Parental presence: Two single item measures (parent presence on last shift, parent time present as less or more than half the shift_	Correlations present between nurse participation in hospital affairs and nurse manager ability, leadership, and support for nurses and higher parental presence; composite also correlated with higher parental presence Parental presence also significantly correlated with level A (low-level) NICUs Only the composite and higher parental presence remained statistically significant in a multiple linear model even when accounting for NICU level
Li, Li, & Wan (2019)	410 nurses from 32 community health centers in Beijing, China To test the relationship between work practice environment and turnover	Cross-sectional, correlational study	Job -Demand Resources Model and the Conservation of Resources Theory Work practice environment – Chinese version of the Practice Environment Scale	The structural equation model demonstrated goodness of fit and explained 29% of the variance in turnover intention and 18% in work engagement A significant negative relationship was

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	intention, considering the mediation of work engagement and the moderation of work pressure among community health nurses		Work Pressure – Job stressor scale of Turnover intention – Four item scale Work engagement – Chinese version of the Utrecht Work Engagement Scale Demographics - Age - Gender - Marital status - Education - Work seniority	identified between turnover intention and work engagement ($\beta = -.20 [-.341, -.065]$, $p = .021$) Work practice environment directly ($\beta = -.43 [-.639, -.305]$, $p = .021$) and indirectly ($\beta = -.08 [-.148, -.006]$, $p = .012$) effects turnover and directly effects work engagement ($\beta = .42 [.482, .605]$, $p = .013$) Work engagement partially mediated the work practice environment relationship with turnover
O'Hara, Burke, Ditomassi, & Palan Lopez, (2019)	375 Millennial nurses working in a large Magnet hospital in the northeastern US To assess the relationship between demographic factors and work environment, and work satisfaction to increase understanding of millennial nurses	Descriptive, correlational design	The Practice Environment Conceptual Framework developed by Erikson et al. Demographics - Age - Gender - Race - Work status - Degree - Experience - Years at current setting Professional Practice Work Environment; PPWE Inventory	86% of Millennial nurses were somewhat satisfied, satisfied, or very satisfied 14% were somewhat dissatisfied working in their current unit Age explained 2.6% of the variance in job satisfaction Supportive leadership explained 63% of the variance in job satisfaction
Tabakakis, McAllister, Bradshaw, & To (2019)	480 RNs in New Zealand To investigate the impact of workplace factors on psychological resilience in registered nurses	Cross-sectional correlational design	The Health Services Workplace Environment Environmental Resilience Model Demographic and job-related characteristics - Age - Gender	Resilience was not significantly associated with age, gender, ethnicity, relationship status, highest nursing qualification, employment type, place of employment, or year employed

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
			- Ethnicity - Relationship status - Employment status - Highest nursing qualification - Years employed - Place of employment Psychological resilience – Connor-Davidson Resilience Scale Practice Environment – PES-NWI Perceived exposure to negative acts – Negative Acts Questionnaire-Revised Intention to leave – Single item measure (in the last twelve months)	Resilience was significantly correlated with intent to leave ($p < .001$) Resilience correlated with: PES ($r = 0.30$, $p < .001$) NPHA ($r = 0.23$, $p < .001$) NFQC ($r = 0.28$, $p < .001$) NM ($r = 0.24$, $p < .001$) SRA ($r = 0.27$, $p < .001$) CNPR ($r = 0.30$, $p < .001$) NAQ-R ($r = -0.28$, $p < .001$) Person-related bullying ($r = -0.25$, $p < .001$) Work-related bullying ($r = -0.31$, $p < .001$) Resilience was not significantly correlated with Physically intimidating bullying For every unit increase in PES: 2.48-point increase in resilience ($p < .001$) For every unit increase in NAQ-R: 0.07-point decrease in resilience ($p < .001$) Associations remained significant controlling for age, gender, relationship status, years employed as a nurse, highest nursing qualification, and intent to leave PES 2.76 ($p < .001$)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				NAQ-R -0.08 (p = .003) This combination of variables with control variables accounted for 14.5% of the variance in resilience
Dols, Chargualaf, & Martinez, (2019)	95 nurses working in a 250+ bed tertiary hospital in south Texas To identify evolving cultural and generational factors influencing nurse retention	A cross-sectional, single site descriptive study	Theory not specified Demographics - Age - Sex - Ethnicity - Support status - Year actively worked as an RN - Years at this hospital - Education - Employment setting - Employment status - Number of hours worked per week and per day Career Survey for Nurses Nursing Leadership Preferences Survey Practice Environment – NWI-R	Nurses who reported not being able to meet their patient's needs were more dissatisfied; Average percentage of nurses reporting inability to meet their patient's needs were [mean (sd)]: Baby Boomers 16.34% (25.99%) Generation X 19.93% (24.81%) Millennials 21.10% (23.98%) Millennial Hispanics more positive perception of practice environment compared to non-Hispanic Millennials and Hispanic Generation X Generation X non-Hispanic nurses more positive perception of practice environment compared to non-Hispanic Millennials Director Traits Rankings: Millennial Hispanic Attitude - 1. Calm 2. Cooperative 3. Supportive 4. Hard Work Ethic Intrinsic - 1. Dedicated

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				Motivated (tied) 2. Honest 3. Strong willed 4. Dependable Millennial non-Hispanic Attitude - 1. Supportive 2. Respectful of subordinates 3. Positive attitude 4. Approachable Intrinsic - 1. Dependable 2. Nonjudgmental 3. Understanding 4. Dedicated Motivated (tied) Generation X Hispanic Attitude - 1. Approachable 2. Hard work ethic 3. Respectful of subordinates 4. Fair Intrinsic - 1. Honest 2. Understanding 3. Motivated 4. dedicated Generation X non-Hispanic Attitude - 1. Supportive 2. Approachable 3. Respectful of subordinates 4. Reasonable Intrinsic - 1. Integrity 2. Dependable 3. Trustworthy 4. Wise
Adolfo, (2019)	374 nurses working in two government and two private hospitals in the Philippines	Cross-sectional, correlational design	Discussion of practice environment literature; theory not specified Demographics - Age	Only nurse sex and practice area were significant predictors of nurse quality safety

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	To examine the contribution of nurses' perceptions of their practice environment on their perceptions of their practice environment's quality and safety		- Sex - Marital status - Education - Experience - Current hospital - Monthly salary - Hours per week - Hospital type Practice environment – PES-NWI Nursing Quality Safety – Nursing Quality Safety Self Inventory	Sex predicted knowledge ($\beta = 0.761$, $p = .04$) and attitude ($\beta = .824$, $p = .02$) Practice area predicted knowledge ($\beta = .758$, $p = .03$) and attitude ($\beta = .353$, $p = .05$) Practice environment was not a significant predictor of nurse quality safety
Zangaro & Jones (2019)	80,563 registered nurses across 51 studies Using meta-analysis to examine the reliability generalization of the PES-NWI.	Meta-Analysis	PES-NWI	Reliability of PES-NWI composite: $\alpha = .922$ [.904, .936] Reliability of subscales: NPHA $\alpha = .825$ NFQC $\alpha = .774$ NM $\alpha = .832$ SRA $\alpha = .806$ CNPR $\alpha = .829$ Variability of effect sizes: $Q = 5,331.514$, $df = 37$, $p < .05$, $I^2 = 99.31\%$ Reliability of the PES-NWI differed by setting with “other” settings demonstrating stronger reliability; high quality studies demonstrated lower reliability compared with lower and moderate quality studies
Wu, Hayter, Lee, Yuan, Li, Bi, Zhang, Cao, Gong, & Zhang (2020)	391 nurses working in two hospitals located in the Jiangsu Province of China To explore the relationship	Cross-sectional, correlational design	Transformational Leadership Theory Demographics - Age clinical site - Total years' experience	Spiritual climate was negatively correlated with emotional exhaustion ($r = -.455$, $p < .01$) and turnover intention ($r = -.323$, $p < .01$)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	between spiritual climate and transformational leadership, and examine their impact on nurses perceived emotional exhaustion and intentions to quit		The Multifactor Leadership Questionnaire Chinese The Spiritual Climate Scale Chinese Maslach's Emotional Exhaustion Scale Chinese Turnover Intention Scale Chinese	Mediation analysis using Sobel test: Transformational leadership associated with Spiritual climate ($a = 0.198, p < .01$) and emotional exhaustion ($c = -.115, p < .01$) Spiritual climate negatively associated with emotional exhaustion ($b = -0.499, p < .01$); Sobel test was significant ($p < .01$) Significant indirect effect of spiritual climate on the relationship between transformational leadership and emotional exhaustion
Lee, Ju, & Lim, (2020)	267 nurses working in four general hospitals in South Korea To investigate the intent to leave or stay among Korean hospital nurses and to identify what factors influence their intent to leave or stay	Cross-sectional, correlational design	Price and Mueller Turnover Model Nursing Work Environment – Practice Environment of the Nursing Work Index Korean Job Satisfaction – Job Satisfaction Scale of Clinical Nurses Korean Burnout – Maslach burnout inventory Korean Organizational commitment – 15 item scale, Korean Intent to leave and Intent to stay – 16 item scale, Korean	Intent to leave by: Age ($F = 4.08, p = .007$) Intent to leave (ITL) differed according to: Education ($F = 5.99, p = .003$) Religion ($F = 2.66, p = .049$) Department ($F = 5.82, p = .001$) Clinical career ($F = 3.92, p = .009$) Hospital size ($F = 3.88, p = .010$) Post hoc test demonstrated intent to leave was higher among: Nurses aged 26-40 compared to 41+, Nurses without a religion or with a religion other than Catholicism compared to Catholics, Nurses working in internal medicine

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				compared to those working in the ICU, ER, or OR; Nurses with a total clinical career of 6-15 years than those 15+; Nurses working in 399 beds or fewer than those working in a hospital with 800+ Intent to leave correlated with: Work environment ($r = -.48, p < .001$) Job satisfaction ($r = -.41, p < .001$) Organizational commitment ($r = -.54, p < .001$) Burnout ($r = .33, p < .001$) Intent to stay differed according to the same as ITL plus Marital status ($t = -2.17, p = .031$) Monthly salary ($F = 3.94, p = .009$) Intent to stay was higher among: Nurses age 41+, Married nurses compared to single, Nurses with a master's degree compared to bachelors or lower, Christian nurses compared to Buddhist, Nurses working in units other than Internal Medicine, Nurses with <1 year or greater than 15 years' experience compared to those with 1-14 years' experience, Nurses working in 800+ bed hospitals, Nurses with monthly income of 4 million KRW or more compared to income of

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				3.99 million KRW or less Intent to leave affected by ($F = 63.60$, $p < .001$, R^2 of .39): Organizational commitment ($\beta = -.32$, $p < .001$) Work Environment ($\beta = -.22$, $p = .001$) Burnout ($\beta = .20$, $p < .001$) Master's degree or higher ($\beta = -.13$, $p = .010$) Working in a special unit ($\beta = -.12$, $p < .045$) Factors affecting Intent to Stay ($F = 63.60$, $p < .001$, R^2 of .42): Organizational commitment ($\beta = .59$, $p < .001$) Clinical career ($\beta = .11$, $p = .020$) Hospital size ≥ 800 beds ($\beta = .11$, $p = .018$)
Cheng, Cui, Chen, Ye, Liu, Zhang, Zeng, & Hu, (2020)	300 pediatric nurses from 3 Class A tertiary hospitals in Jilin Province To develop and test a hypothesized model that uses path analysis to explore the relationships among general self-efficacy, perceived organizational support, nurses' perceived professional	Descriptive, cross-sectional study using path analysis	Theory not specified General Self-Efficacy Scale Perceived Organizational Support Scale Practice Environment – PES-NWI Chinese Nurses' Perceived Professional Benefits Scale	All variables were significantly correlated with one another All paths with POS, GSE, NPE, and NPPB were significant in the path model POS had significant direct effects on NPE ($\beta = 0.677$, $p < .000$) and NPPB ($\beta = 0.640$, $p < .000$) NPE had significant direct effects on NPPB ($\beta = 0.257$, $p < .000$)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	benefits, and nursing practice environment			GSE had significant direct effect on NPE ($\beta = 0.430$, $p < .000$) POS ($\beta = 0.174$, $p < .000$) and GSE ($\beta = 0.111$, $p < .000$) had significant effects on NPPD through NPE
Pereira Lima Silva, Goncalves Meneguetti, Dias Castilho Siqueria, de Araujo, Auxiliadora-Martins, Montovani Silva Andrade, & Laus, (2020)	29 nurses working on 3 ICUs in Brazil To characterize the omission of nursing care according to the nurses' perception of the professional practice environment and the nursing workload of intensive care units (ICU) in Brazil	Cross-sectional descriptive design	Kalish's Missed Nursing Care conceptual framework Practice Environment – PES-NWI Brazilian Missed care – MISSCARE – Brasil (hours) Workload – Nursing Activities Score instrument (hours)	ICU 1: 89.85 NAS compared to 21.5 missed care; mixed work environment PES mean(sd) NPHA 2.3(0.3) NFQC 2.4(0.4) NM 2.6(0.8) SRA 2.3(0.4) CNPR 2.8(0.4) ICU 2: 67.13 NAS compared to 16.1 missed care; favorable work environment PES mean(sd) NPHA 3.1(0.3) NFQC 3.0(0.4) NM 3.3(0.4) SRA 2.6(0.4) CNPR 2.9(0.1) ICU 3: 64.17 NAS compared to 15.5 missed care; mixed work environment PES mean(sd) NPHA 2.5(0.9) NFQC 2.8(0.6) NM 2.7(0.8) SRA 2.5(0.5) CNPR 3.0(0.4)
Slater, Roos, Eskola, McCormack, Hahtela, Kurjenluoma, & Suominen, (Slater et al., 2020)	605 Finnish nurses working across 5 clinical settings To examine the impact of predictive work environment factors on nurses' intention	Cross-sectional, correlational design	JOINT Model of Turnover Nursing Content Index - Stressors in work - Job satisfaction - Organizational characteristic - Intention to leave	Statistically significant predictors of intention to leave: Work life balance $\beta = 0.131$, $p = .009$ Lack of support staff ($\beta = -.168$, $p = .007$) Satisfaction with pay ($\beta = .131$, $p = .009$)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	to leave their position and to explore contributing factors			Satisfaction with training ($\beta = .131, p = .009$) Personal satisfaction ($\beta = .131, p = .009$) Nursing management ($\beta = .131, p = .009$) Organizational commitment ($\beta = .131, p = .009$) Path analysis of five factors: 1. Work Stress and preparation 2. Interpersonal relationships 3. The work climate 4. Satisfaction with the profession and resources 5. Organizational management Only factor 4 was associated with ITL (-1.048); individual items “professional satisfaction” ($-.238$) and “organizational commitment” ($-.171$) were independently associated with ITL
Smith, Lapkin, Sim, Halcomb, (2020)	383 nurses working in rural hospitals in Australia To examine nursing care left undone and its relationship with the nursing practice environment and perceived quality of nursing care in small Australian rural hospitals	Cross-sectional descriptive design	Theory not specified Nurse characteristics Nursing practice environment – NWI-R: Australian Care left undone – 13 activities considered necessary Quality of care – Single item measure previously utilized in international research	Moderate correlation between care left undone and quality of care ($r = -0.37, p < .01$) Moderate correlations between care left undone and NWI subscales – mean ($r = -0.36, p < .01$) Moderate correlations between: CNPR and quality of care ($r = 0.43, p < .01$) NPHA and quality of care ($r = 0.48, p < .01$)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				NM and quality of care ($r = 0.44, p < .01$) Strong correlation between quality of care and SRA ($r = 0.52, p < .01$) Quality of care and NFQC ($r = 0.61, p < .01$) Quality of care and composite NWI ($r = 0.60, p < .01$) Nurses reporting care left undone reported lower practice environment ($p < .001$) Nurses reporting care left undone report lower quality of care ($t(381) = 7.71, p < .001, r = 0.38$)
Sillero-Sillero & Zabalegui (2020)	130 nurses working in Surgical department of a Spanish public university hospital To investigate how the perioperative work environment affects work dissatisfaction, professional exhaustion, and the perception of the quality of care about the intention of abandoning the work of perioperative nurses	Cross-sectional, descriptive correlational design	Discussion of Magnet facility research basis; theory not specified Work Environment – Practice Environment Scale of the Nursing Work Index Spanish Burnout – Maslach burnout inventory Spanish Quality of Care – Single item measure Intention to abandon work – single item (yes/no) Job satisfaction – 9 item scale	Scores on the NFQC and CNPR were higher in the perioperative environment compared to studies in other work areas across Spain Nurses dissatisfied with work were 2.3 times more likely to abandon work Nurses with high emotional exhaustion also had 1.11 times greater risk to abandon work Higher SRA associated with lower intention to abandon work

Author (Year)	Sample/Purpose	Study Type/Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
Povedano-Jimenez, Granados-Gamez, & Garcia-Caro, (2020)	534 nurses in the Spanish Colleges of Nursing To explore self-perception competence among Spanish nurses dealing with patient death and its relationship with work environment, evidence-based practice, and occupational stress	Cross-sectional, correlational design	Theory not specified Demographic and work-related data - Age - Sex - -education - Years of practice - Work setting - Unit - Specialty - Type of health center Coping with Death Scale Spanish Practice Environment Scale of the Nursing Work Index Spanish Perception of Evidenced-Based Practice Questionnaire Nursing Stress Scale Spanish	Compared to older nurses, younger nurses reported inadequate coping ($p < .001$) Respondents reporting lower SRA also reported inadequate coping (1.7 ± 0.6) Respondents reporting adequate coping scored higher on EBP and reported less stress (81.1 ± 15.1). PES demonstrated positive association with EBP ($\beta = 0.12$, $p < .05$) and negatively associated with occupational stress ($\beta = -.10$, $p < .015$) A positive attitude towards EBP was the most significant predictor of coping with death ($\beta = 0.29$, $p < .001$) Lower coping associated with less than 10 years' experience ($\beta = -0.10$, $p < .001$)
Liao, Yeh, Lin, & Wang, (Liao, Yeh, Lin, & Wang, 2020)	2,605 nurses working on 125 units in seven hospitals in China To explore a hierarchical model of occupational burnout that is associated with job-induced stress, nurse self-concept, and	Cross-sectional, correlational design	Maslach's Burnout Model Demographics - Age - Gender - Years of experience - Marital status - Education - Monthly salary Occupational Burnout – Maslach Burnout Inventory Human Services Survey	Hospital level was removed from HLM model due high collinearity among variables; cross-level model also did not converge due to multicollinearity Nurse self-concept was negatively associated with emotional exhaustion Nurse self-concept was negatively

Author (Year)	Sample/Purpose	Study Type/Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
	practice environment		Job Induced Stress – Nurse Stress Checklist Nurse Self-Concept – Nurses’ Self Concept Instrument Chinese Nursing Work Environment – Nursing Work Index – Revised: Chinese	associated with depersonalization Aspects of occupational burnout showed greater variation among nursing units rather than among individual nurses
Koy, Yunibhand, Angsuroch, & Turale, (2020)	375 nurses from 12 government hospitals in Cambodia To examine the causal relationships between RN perceptions of care quality and the factors affecting their work in Cambodian hospitals	Cross-sectional, descriptive design using Structural Equation Modeling	“Nurse Work Environment, Nurse Staffing, and Outcome Model” Number of patients assigned on last shift Index of Work Satisfaction Copenhagen Burnout Inventory PES-NWI, only 30 items The Cambodian Nursing Care Quality Scale (author developed)	Nurse work satisfaction has a direct negative effect on Nurse Care Quality and Number of patients assigned ($b = -.26$) and a direct positive effect on NB ($b = .22$) Practice Environment did not directly affect nurse care quality, nurse burnout, or nurse work satisfaction Number of patients assigned did not affect nurse care quality or burnout Nurse work satisfaction, practice environment, number of patients assigned, and burnout explained 12% of the variance in nurse care quality Number of patients assigned and practice environment explained 8% of the variance in nurse work satisfaction Number of patients assigned, practice environment, and

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
				work satisfaction explained 6% of the variance in burnout
Halcomb & Bird, (2020)	786 nurses working in Australian General Practices To investigate the job satisfaction and turnover intentions of nurses working in Australian general practice	Cross-sectional, descriptive design	Theory not specified Job satisfaction – 29 item survey Turnover Intention – modified version of the Nurse Retention Index	72.8% of general practice nurses reported no intention to leave; 7.9% report intention to leave; 19.3% were undecided Higher satisfaction scores were associated with lower intention to leave Only the total satisfaction score was a statistically significant predictor of intention to leave ($p < .001$) Nurses reporting dissatisfaction were 6.1 [3.7, 10.2] times more likely to demonstrate intention to leave Nurse reporting indecision were 4.8 [2.7, 8.4] times more likely to report intention to leave
Ambani, Kutney-Lee, & Lake (2020)	320 nurses working in one public and one military hospital in Saudi Arabia To assess the nursing practice environments and nurse job-related outcomes in two types of hospitals in Saudi Arabia	Cross-sectional, path analysis	The Modified Model for Nurse Turnover (author conceptual model) Demographics - Age - Gender - Nationality - Marital status - Number of children aged < 18 years - Education - Experience Nursing practice environment –	Practice environment scores were significantly lower for public hospital Nurses cared for 1.62 more patients in the public hospital compared to the military hospital Path analysis: Job dissatisfaction to intent to leave (0.48) Burnout to intent to leave (0.43)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
			Practice Environment Scale of the Nursing Work Index Burnout – Maslach Burnout Inventory Emotional Exhaustion subscale Job dissatisfaction – Single item measure Intention to leave – Single item measure Patient to nurse ratio – single item measure	Age 31-35 to intent to leave (0.55) Children < 18 to intent to leave (-.14) Saudi to intent to leave (-.41) Children to job dissatisfaction (.34) Practice environment to job dissatisfaction (-1.15) Patient to nurse ratio to burnout (.03) Saudi to burnout (.41) Practice environment to burnout (-.36)
Bagnasco, Dasso, Rossi, Timmins, Watson, Aleo, Catania, Zanini, & Sasso, (2020)	2,243 Italian pediatric nurses working on 169 units To explore Italian pediatric nurses' reported burnout and its relationship to their perceptions of safety and adverse events	Cross-section, correlational design	Discussion of burnout and safety culture; theory not specified Demographics 1. Age 2. Gender 3. Experience 4. Education Burnout – Maslach Burnout Inventory Overall grade of patient safety – single item from the AHRQ Patient Safety Culture Survey Adverse Events – Nurse-reported occurrence of 1. Medication administration errors 2. Pressure ulcers 3. Falls with injuries 4. Urinary tract infections 5. Bloodstream infections 6. Pneumonia	Higher level of emotional exhaustion (EE) increased the risk of negative patient safety grade in: Surgical (OR = 1.056 [1.024, 1.090], p < .001) Medical (OR = 1.029 [1.012, 1.047], p < .001) Critical care (OR = 1.042 [1.014, 1.071], p < .01) Personal accomplishment reduces risk of poor safety grade in : Surgical (OR = 0.952 [0.906, 1.036]), p = .01)

Author (Year)	Sample/Purpose	Study Type/ Analysis	Theory/Concepts (Empirical Indicators)	Significant Findings
Huang, Wang, Dong, Li & Wan, (2020)	43 units from two psychiatric hospitals in Beijing To focus on psychiatric nurses and examine the relationship among nursing work environment, nurse perceived quality of care, turnover intention, and work engagement using structural equation modeling	Cross-sectional, descriptive design	Theory not specified Nursing work environment – PES-NWI Chinese Work engagement – Utrecht Work Engagement Scale, nine item Chinese version Quality of care – Single item measure Turnover intention – Turnover Intention Scale	Nursing work environment had direct effects on: Quality of care ($\beta = .498, p < .05$) Turnover intention ($\beta = -.394, p < .05$) Work engagement partially mediated the work environment effect on: Quality of care ($\beta = .096, p < .05$) Turnover intention ($\beta = -.296, p < .05$) Model explained 36% of the variance in quality of care and 56% of the variance in turnover intention

Appendix B.

Instruments

Practice Environment Scale of the Nursing Work Index

This scale has been modified for use among Army nursing samples and was provided to the primary investigator by the Executive Officer for the Army Nurse Corps, Army Nurse Corps Chief's office, for use in this proposed study. Response options for each question include strongly disagree, disagree, agree, and strongly agree.

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/DCN/DNS who is highly visible and accessible to staff.
4. A chief nursing officer/DCN/DNS 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 administrators consult with staff on daily problems and procedures

Nursing foundations for quality 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 performance improvement program.
6. A preceptor program for newly hired RNs.
7. Nursing care is based on a nursing, rather than a medical, model.
8. Written, up-to-date 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 for nurses.

1. A supervisory staff that is supportive of the nurses.
2. Supervisors use mistakes as learning opportunities, not criticism.
3. (a) A nurse manager/clinical nurse officer in charge/department head who is a good manager and leader.

(b) A noncommissioned officer in charge/leading petty officer who is a good manager and leader.

Team leadership model: responses to both questioned averaged.

1. Praise and recognition for a job well done.
2. 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 patient
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 teamwork between nurses and physicians.
3. Collaboration (joint practice) between nurse personnel and physicians.

TEAMSTEPPS Teamwork Perceptions Questionnaire

From the Agency for Healthcare Research and Quality TeamSTEPPS Teamwork Perceptions Questionnaire Manual (Agency for Healthcare Research and Quality, 2010). Answer options for each question include strongly agree, agree, neutral, disagree, or strongly disagree.

Team Structure.

1. The skills of staff overlap sufficiently so that work can be shared when necessary
2. Staff are held accountable for their actions.
3. Staff within my unit share information that enables timely decision making by the direct patient care team
4. My unit makes efficient use of resources (e.g., staff, supplies, equipment, information).

5. Staff understand their roles and responsibilities.
6. My unit has clearly articulated goals.
7. My unit operates at a high level of efficiency.

Leadership.

8. My supervisor/manager considers staff input when making decisions about patient care.
9. My supervisor/manager provides opportunities to discuss the unit's performance after an event.
10. My supervisor/manager takes time to meet with staff to develop a plan for patient care.
11. My supervisor/manager ensures that adequate resources (e.g. staff, supplies, equipment, information) are available.
12. My supervisor/manager resolves conflict successfully.
13. My supervisor/manager models appropriate team behavior.
14. My supervisor/manager ensures that staff are aware of any situations or changes that may affect patient care.

Situation Monitoring.

15. Staff effectively anticipate each other's needs.
16. Staff monitor each other's performance.
17. Staff exchange relevant information as it becomes available.
18. Staff continuously scan the environment for important information.
19. Staff share information regarding potential complications (e.g. patient changes, bed availability)

- 20. Staff meet to reevaluate patient care goals when aspects of the situation have changed.
- 21. Staff correct each other's mistakes to ensure that procedures are followed properly.

Mutual Support.

- 22. Staff assist fellow staff during high workload.
- 23. Staff request assistance from fellow staff when they feel overwhelmed.
- 24. Staff caution each other about potentially dangerous situations.
- 25. Feedback between staff is delivered in a way that promotes positive interactions and future change.
- 26. Staff advocate for patients even when their opinion conflicts with that of a senior member of the unit.
- 27. When staff have a concern about patient safety, they challenge others until they are sure the concern has been heard.
- 28. Staff resolve their conflicts, even when the conflicts have become personal.

Communication.

- 29. Information regarding patient care is explained to patients and their families in lay terms.
- 30. Staff relay relevant information in a timely manner.

31. When communicating with patients, staff allow enough time for questions.
32. Staff use common terminology when communicating with each other.
33. Staff verbally verify information that they receive from one another.
34. Staff follow a standardized method of sharing information when handing off patients.
35. Staff seek information from all available sources.

Appendix C.

Mediation Analyses

Hypothesis 3

Hypothesis three stated US Army primary care clinic team performance will mediate the relationship between the nursing practice environment and (a) staff perception of overall patient safety, (b) staff nurses' job satisfaction, and (c) staff nurses' intent to leave. However, bivariate analyses found no relationship between team performance and staff nurse intent to leave. Therefore, hypothesis 3c was not evaluated. The results of hypothesis testing for hypotheses 3a and 3b are presented in this appendix.

Hypothesis 3a-b. A PROCESS matrix was utilized to estimate the mediating potential of the dimensions of team performance in the relationship between the nursing practice environment and the dimensions of clinic staff perception of overall patient safety and staff nurse job satisfaction controlling for covariates (Hayes, 2018). A simple mediation model using 10,000 bootstrap samples and a 95% confidence interval estimated the mediating potential of situation monitoring in the relationship between the composite PES-NWI and (a) manager expectations and actions promoting safety, (b) organizational learning, and (c) communication openness. The indirect effects (*ab*) for each of these models were not significant. Therefore, situation monitoring did not mediate the relationship between the nursing practice environment and (a) manager expectations and actions promoting safety, (b) organizational learning, and (c) communication openness. The total effect (*c*) and mediation (*c'*) models are presented in Figures 3, 4, and 5.

Figure 3.

Total Effect and Mediation Model for Manager Expectations and Actions Promoting Patient Safety

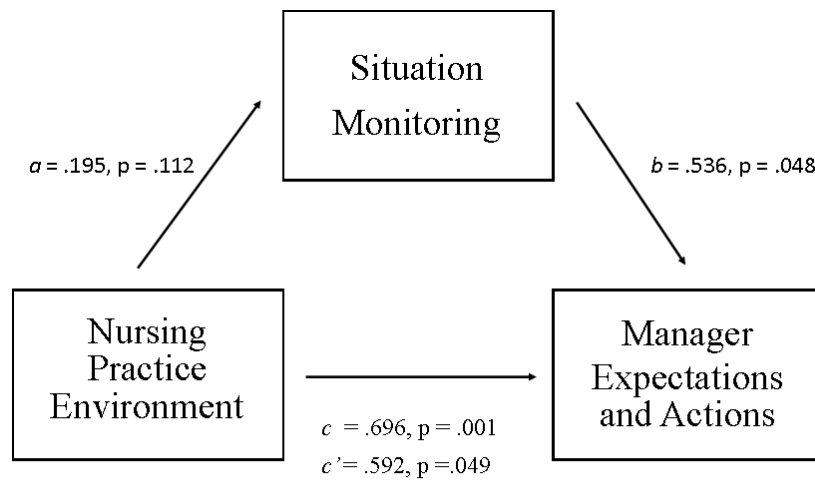


Figure 4.

Total Effect and Mediation Model for Organizational Learning – Continuous Improvement

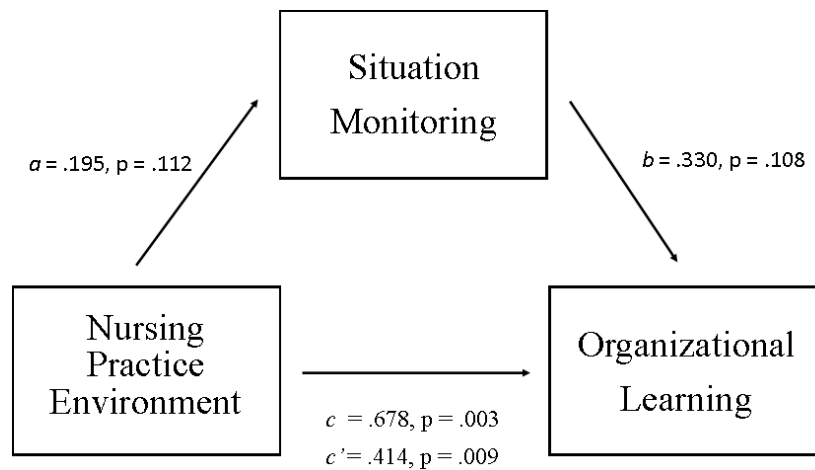
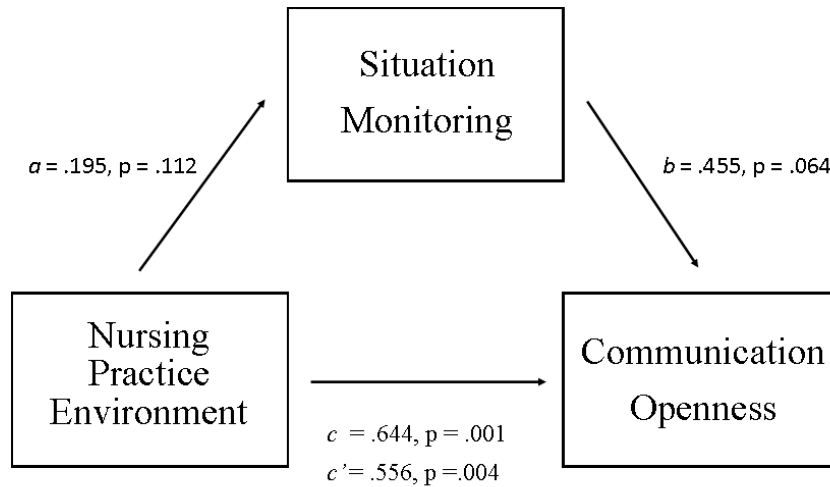


Figure 5.

Total Effect and Mediation Model for Communication Openness



A simple mediation model using 10,000 bootstrap samples and a 95% confidence interval estimated the mediating potential of team structure in the relationship between the composite PES-NWI and (a) frequency of events reported controlling for RN hours per 1000 patient encounters and (b) staff nurse job satisfaction controlling for RN assigned FTEs. Simple mediation models were estimated and the indirect effects (ab) for both models were not statistically significant. Therefore, team structure did not mediate the relationship between the nursing practice environment and (a) frequency of events reported and (b) staff nurse job satisfaction. The total effect (c) and mediation (c') models are presented in Figures 6 and 7.

Figure 6.

Total Effect and Mediation Model for Frequency of Events Reported

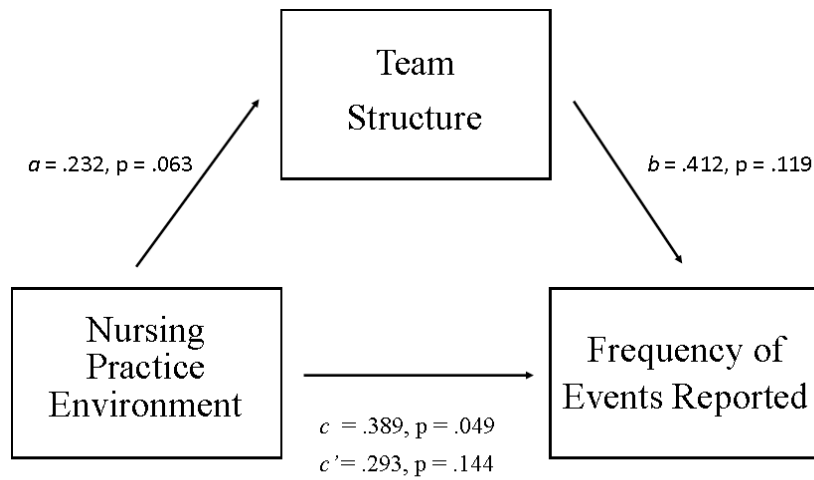


Figure 7.

Total Effect and Mediation Model for Staff Nurse Job Satisfaction

