

AN INTEGRATIVE LITERATURE REVIEW: THE RELATIONSHIP
BETWEEN HEALTHY WORK ENVIRONMENT AND
NURSING-SENSITIVE PATIENT OUTCOMES

by

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TABLE OF CONTENTS

1. RESEARCH PROBLEM.....	1
Introduction.....	1
Purpose.....	2
Background.....	2
Nursing-Sensitive Patient Outcomes	6
Patient Safety	8
Nursing Work Environment.....	12
Theoretical Framework.....	20
Florence Nightingale’s Philosophy on Nursing.....	20
Donabedian’s Structure, Process, Outcomes Framework.....	22
Significance of Project.....	24
Research Question	24
Limitations	25
Definition of Terms.....	25
Assumptions.....	27
2. SEARCH METHODS	28
Literature Search.....	28
Inclusion/Exclusion Criteria	28
Search Methods.....	29
Databases	29
Search Terms	30
Supplemental Search Methods.....	30
Findings.....	30
CINAHL	30
Medline	31
AHRQ PSN.....	32
The Robert Wood Johnson Foundation	32
Hand Search.....	33
3. DATA ANALYSIS METHODS	35
Evaluation of Data	35
Quality of Research.....	35
Data Reduction.....	36
Data Display.....	37
Data Comparison	37
Identification of Patterns, Themes, Variations and Relationships.....	37
Conclusion Drawing and Verification	38

TABLE OF CONTENTS - CONTINUED

4. PRESENTATION OF FINDINGS	39
Overview	39
Summary of Literature	39
Quality	39
Themes	40
Research Findings Based on Themes	40
Study Location	40
Study Design	41
Study Populations	42
Sample Size	42
Outcome Measures	43
Type of Healthy Work Environment	44
Measurement of Healthy Work Environment	47
Discrepancies Found in the Review	48
Gaps in the Literature	48
Conclusions	49
5. DISCUSSION AND SUMMARY	51
Discussion	51
Introduction	51
Summary	51
Theoretical Framework	52
Inconsistent Findings	53
Supportive Findings	55
Strengths	55
Limitations	55
Research Articles	55
Research Methodology	57
Implications and Recommendations	59
Nursing Practice	59
Nursing Education and Administration	60
Research	61
Summary	63
REFERENCES CITED	65
APPENDICES	73
APPENDIX A: Checklist for Assessing Quality	74
APPENDIX B: Summary of Included Studies	82

TABLE OF CONTENTS - CONTINUED

APPENDIX C: Summary of Supportive Studies.....	85
APPENDIX D: Summary of Inconsistent Studies.....	93

LIST OF TABLES

Table	Page
1. CINAHL Studies Meeting Inclusion Criteria	31
2. Medline Studies meeting Inclusion Criteria	32
3. Hand-search Studies Meeting Inclusion Criteria	33
4. Magnet Website Studies Meeting Inclusion Criteria	34
5. Quality Scores.....	40
6. Location	41
7. Study Design.....	41
8. Study Populations	42
9. Sample Size.....	43
10. Nursing-Sensitive Patient Outcomes	44
11. Healthy Work Environment Factor.....	46
12. Measurement Tool	47

ABSTRACT

The impact of the nursing work environment on patient safety has received national attention, and has led to efforts to reduce morbidity and mortality in the health care environment (American Hospital Association, 2004). According to the American Association of Critical-Care Nurses, (2005) there is mounting evidence that unhealthy work environments contribute to medical errors, ineffective care delivery, and stress among health care professionals. There are few studies that examine a healthy work environment and the effect on patient outcomes. The purpose of this integrative literature review was to analyze the research that has been completed on healthy work environments and the effect they have on nursing-sensitive patient outcomes. An extensive literature search was performed using the following databases: the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medical Literature On-Line (MEDLINE), The Agency for Health care Research and Quality Patient Safety Network (AHRQ PSN), and The Robert Wood Johnson Foundation publications on-line database. The studies were evaluated using the following strategies: overall quality, data reduction, and identification of patterns, themes, variations and relationships. They were then further analyzed and synthesized using; data display, data comparison, conclusion drawing and verification. Twelve studies met the inclusion criteria and were compiled, organized by theme and analyzed based on similarities and differences. The data was examined, discrepancies and gaps in literature were discussed and conclusions were drawn based on the patterns found in the literature. The majority (n= 9; 75%) of the articles that met inclusion criteria suggested that a healthy work environment effects nursing sensitive patient outcomes by showing a decrease in the number of negative outcomes. However researchers used multiple healthy work environment factors and different patient outcomes in each study making it difficult to compare results. The findings of this research suggests the need for better identification of a healthy work environment, the use of consistent nursing-sensitive patient outcomes by researchers, and suggests the importance of a healthy work environment on all aspects of patient care. Findings strengthen the principle that the work environment at the unit level mediates the effects of nursing interventions.

CHAPTER 1

RESEARCH PROBLEM

Introduction

Health care is a fast-paced, intense environment that is facing increased patient acuity and shorter hospital stays, nursing shortages, and constantly changing work environments. Creating a healthy work environment for nurses has become more important than ever. The impact of nurse work environments on patient safety has received national attention and has led to efforts to reduce morbidity and mortality in the health care environment (American Hospital Association, 2004).

According to the American Association of Critical-Care Nurses (AACN), (2005) there is mounting evidence that unhealthy work environments contribute to medical errors, ineffective care delivery, and stress among health care professionals. Many studies have focused on patient safety, medical errors and adverse events. Others have studied the nursing work environment. Few addressed nursing work environments and the effect on nursing-sensitive patient outcomes. More specifically, does a work environment perceived as “healthy” by nurses and the organization, fosters a safer environment for patients, resulting in fewer adverse nursing-sensitive patient outcomes. A thorough integrative literature review was executed to find any evidence of a connection between a healthy nursing work environment and improved patient safety outcomes, specifically nursing-sensitive patient outcomes.

Purpose

The purpose of this integrative literature review is to analyze the research that has been completed on healthy work environments and the effect they have on nursing-sensitive patient outcomes.

Background

Patient safety is one of the most important elements of health care today. Hospitals are focused on creating safe, healthy environments within their organizations. A safe environment starts with an atmosphere that is free of harm to patients seeking health care (American Hospital Association, 2004). According to the National Quality Forum (NQF), (2010),

Americans are exposed to more preventable medical errors than patients in other industrialized nations. Each year, 1.7 million infections occur in U.S. hospitals, accounting for nearly 99,000 associated deaths. It is estimated that preventable errors cost the United States \$17-\$29 billion per year in health care expenses, lost worker productivity, and disability. As health care expenditures grow at more than seven percent each year, patient safety is improving by only one percent (p. 2).

In November 2008, the National Priority Partnership (NPP) deemed patient safety as one of the six national priorities, with specific focus on reduction of hospital-level mortality rates, serious adverse events, and health care associated infections.

A culture of safety and healthy work environment for nurses has become more visible in recent years with the release of research studies detailing health care errors. The Institute of Medicine (IOM) report released in November of 1999 (To Err is Human) indicated that medical errors contributed to a large number of deaths in the United States alone. In fact, many experts were shocked to find out that more people die each year

from medical errors in US hospitals than from traffic accidents, breast cancer or acquired immune deficiency syndrome (AIDS). This report called for the transformation of nurse work environments to protect patients from preventable health care errors (Institute of Medicine, Committee on Quality Health Care in America, 1999).

Despite this report, there is little evidence that nursing work environments have improved. In fact, in an online poll of 15,000 nurses conducted by the American Nurses Association (ANA) (2009), staffing shortages continue to effect workplaces and 51.6% of the nurses noted that the quality of patient care on their units had declined in the last year. Nurses' constitute the largest percentage of hospital staff. Therefore many of the medical errors and adverse events documented can be attributed to nursing care. In other words errors were associated with nursing-sensitive patient outcomes or indicators.

Nearly ten years after the initial report "To Err is Human" (IOM, 1999), The Agency for Health care Research and Quality (AHRQ) reported in the 2008 National Health care Quality Report that patient safety is actually getting worse (Agency for Healthcare Research and Quality, 2008). Recently Medicaid and Medicare have opted to refuse payment of specific "hospital acquired" injury and illness (Centers for Medicare and Medicaid Services, 2008). This has placed more emphasis on creating a culture of safety in the health care environment and focusing on the work environment of nurses. Hospital administrators are scrambling to educate staff to take more precautions and create a healthy environment on every hospital unit.

Many individual factors of the nursing work environment can affect patient care and safety including: adequate staffing, effective communication and teamwork among nurses, competency of nurses, nurses' autonomy, communication and relationships with

physicians, supportive management, and organizational culture (American Nurses Association, n. d.).

Professional organizations such as the American Association of Critical-Care Nurses (AACN), American Nurses' Credentialing Center (ANCC), Joint Commission for Accreditation of Hospitals (JCAH), and the Institute of Medicine (IOM) have identified and established criteria for healthy, professional, magnetic, excellent, and effective work environments. The ANA's National Database of Nursing Quality Indicators (NDNQI) is a database of nursing sensitive indicators. These resources guide and define the research on essential elements of the healthy work environment, including organizational and staffing features (structure), nursing environment and care (process), and nursing-sensitive patient indicators (outcomes).

The original Magnet hospital initiative in 1983 led the research in nurses' work environment (McClure, Poulin, Sovie, & Wandelt, 1983). Since then there has been extensive research by the American Academy of Nursing, The American Nurse Association, and the American Association of Critical-Care Nurses. The Magnet hospital initiative was focused on attracting and retaining nurses by creating work environments that appealed to nurses. The factors that were initially used to identify Magnet environments included low nurse vacancy and turnover rates (American Nurses Credentialing Center, 2004.). Goode, Krugman, Smith, Diaz, Edmonds, & Mulder (2005), described the original Magnet designation as including "fourteen forces of magnetism" and "eight essentials of magnetism" to measure hospitals and nursing environment. Those forces and essentials have served as the basis for transforming work environments and enhancing nursing care (Goode, et al., 2005). The eight essentials of

magnetism are considered critical in a work environment for nurses to deliver quality, safe patient care (Goode, et al., 2005).

The ANCC Magnet Recognition Program's fourteen forces of magnetism included: quality of nursing leadership, organizational structure with flat, decentralized decision making, management style that is participative, personnel policies and procedures supportive of nursing, professional models of care, quality of care, quality improvement, adequate consultation and resources, autonomy, community and the hospital, nurses as teachers, image of nursing, interdisciplinary relationship, and professional development (American Nurses Credentialing Center, 2004). The eight essentials of magnetism included: nurse manager support, control over nursing practice, perceived adequacy of staffing, working with clinically competent nurses, a culture that values concern for the patient as paramount, autonomous nursing practice, positive nurse/physician relationships, and support for education (American Nurses Credentialing Center, 2004, 2004).

In 2005 the American Association of Critical-Care Nurses published the AACN Standards for Establishing and Sustaining Healthy Work Environments: A Journey to Excellence. These standards originated from a commitment to patient care and the recognition that the deepening nursing shortage cannot be changed without healthy work environments that support excellence in nursing practice (American Association of Critical Care Nurses, 2005). The AACN Standards for Establishing and Sustaining Healthy Work Environment's six essential standards were: skilled communication, true collaboration, effective decision-making, appropriate staffing, meaningful recognition and authentic leadership. The standards were directly aligned with the core competencies

for health professionals recommended by the Institute of Medicine, and are congruent with The Joint Commission's National Patient Safety Goals. (American Association of Critical Care Nurses, 2005).

In 1994, the ANA created the Safety and Quality Initiative to research the connection between nursing care and patient outcomes. The Nursing Care Report Card for Acute Care (American Nurses Association, 1995) proposed 21 measures of hospital performance with an established theoretical link to availability and quality of nursing care. Since that time the ANA has maintained a database of nursing quality indicators, which include nursing-sensitive patient safety outcomes, as well as process related indicators.

Nursing-sensitive patient indicators as defined by the ANA, reflect the structure, process and outcomes of nursing care. The structure of nursing care includes the supply of nursing staff, skill level, and education/certification. Process indicators measure aspects of nursing care such as assessment, intervention and nurse satisfaction. Patient outcomes that are determined to be nursing-sensitive are those that improve with greater quality or quantity of nursing care including, pressure ulcers, patient falls, hospital acquired infections, intravenous infiltration, psychiatric physical/sexual assault and use of restraints (American Nurses Association, n. d.).

Nursing-Sensitive Patient Outcomes

The health care system is a complex and rapidly changing environment that demands professional accountability. Nurses are at the center of attention when addressing the health outcomes of the patient. Nursing sensitive-patient outcomes or

indicators have been developed to focus on nursing's contributions to the health of the patient. Nurses are accountable for promoting and upholding the standards of care and practice, and being able to monitor the results of their care to achieve quality outcomes is important (Given, Beck, Etland, Gobel, Lamkin, & Marsee, 2004).

In 2003 the Oncology Nursing Society (ONS) convened a team to develop a definition of nursing-sensitive patient outcomes in oncology. The resulting report included a definition of nursing-sensitive patient outcomes that can be generalized to nursing as a profession. The following key points came from the ONS report on nursing sensitive patient outcomes, (2003):

- Outcomes that focus on how patients and their health care problems are affected by nursing interventions.
- Outcomes that are arrived at or significantly impacted by nursing interventions. The interventions must be within the scope of nursing practice and integral to the process of nursing care; an empirical link must exist.
- Outcomes that are sensitive to nursing care or care provided in collaboration with other health care providers.
- Outcomes that represent the consequences or effects of nursing interventions and result in changes in patients' symptom experience, functional status, safety, psychological distress and/or costs.

The National Database of Nursing Quality Indicators is a database of the ANA; collecting and evaluating unit-specific nursing-sensitive data from hospitals in the United States (National Database of Nursing Quality Indicators, n. d.). NDNQI provides research-based national comparative data on nursing care and the relationship to patient

outcomes (National Database of Nursing Quality Indicators, n. d.). The NDNQI indicators are National Quality Forum (NQF) endorsed as nursing-sensitive measures and are as follows (National Database of Nursing Quality Indicators, n. d.):

- Patient falls with and without injury
- Pressure ulcers: community, hospital and unit acquired
- Skill mix
- Nursing hours per day
- RN surveys: job satisfaction, practice environment scale
- RN education and certification
- Pediatric pain assessment cycle
- Pediatric IV infiltration rate
- Psychiatric patient assault rate
- Restraints prevalence
- Nurse turnover
- Health care associated infections: ventilator-associated pneumonia (VAP), Central line-associated blood stream infection (CLABSI), Catheter-associated urinary tract infections (CAUTI).

Patient Safety

In 1999, the Institute of Medicine (IOM) issued a comprehensive report, summarizing problems of patient safety problems in the health system (Institute of Medicine, Committee on Quality Health Care in America, 1999). In the report the IOM highlighted that at the time of the report at least as 44,000 people and as many as 98,000

people die in hospitals every year from medical errors that could have been prevented (Institute of Medicine, Committee on Quality Health Care in America, 1999). The IOM defined medical errors as “the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim” (Institute of Medicine, Committee on Quality Health Care in America, 1999, p.1). Medical errors listed in the report included; adverse drug events, improper transfusions, surgical injuries, wrong-site surgery, suicides, restraint-related injuries or death, falls, burns, pressure ulcers, and mistaken patient identities (Institute of Medicine, Committee on Quality Health Care in America, 1999).

The report attributed the errors to many things going wrong within the health care system, including: decentralized and fragmented health care delivery system, minimal efforts at preventing errors by health care professionals and organizations, and little incentive to improve safety and quality. The report sets a minimum goal of a 50% reduction in errors over the next five years (Institute of Medicine, Committee on Quality Health Care in America, 1999).

One vital recommendation included in the report was to create better quality safety systems within the health care environment through the implementation of safe practices at the delivery level. This includes interdisciplinary clinical practice among health professionals. Interdisciplinary practice or collaboration is defined as a joint decision-making and communication process among health care providers with the goal of satisfying the needs of the patient while respecting the unique abilities of each professional involved in the care (Colluccio & McGuire, 1983). Attributes of interdisciplinary collaboration include trust, knowledge, mutual respect, good communication, cooperation, coordination, shared responsibility, and optimism

(Colluccio & McGuire, 1983). Studies have shown that environments that support collaboration among physicians, nurses and other health care professionals show evidence of improved patient safety outcomes (Colluccio & McGuire, 1983).

As a follow-up to the IOM report *To Err is Human*, the Consumers Union published a report titled *To Err is Human - To Delay is Deadly: Ten years later, a million lives lost, billions of dollars wasted*, (2009). Based on limited reporting by health care institutions it was believed that preventable medical errors still account for more than 100,00 deaths a year (Consumers Union, 2009). The Centers for Disease Control and Prevention (CDC) estimated that hospital-acquired infections alone result in the deaths of 99,000 people every year (Centers for Disease Control and Prevention, 2002.). In addition, Clancy (2009) identified that ten-years after the IOM report *To Err is Human: Building a Safer Health System*, substantial work remains to be done to ensure patient safety in the health care environment. She went on to fault the environment where health care services are provided for medical errors. Mistakes contribute to a “fragmented, paper-based” health care system that is in need of an overhaul (Clancy, 2009).

Many critics called for organizational culture change in view of this patient safety crisis. Recommendations include improved systems for care delivery, improved communication, teamwork, increased education and support of health care professionals and the use of evidence based patient safety practices (Clancy, 2009; Kramer & Schmalenberg, 2005). The nation’s continuing patient safety challenges were highlighted in the annual AHRQ National Health care Quality Report indicating that patient safety is getting worse instead of better (Agency for Health Care Research and Quality, 2011).

The Joint Commission Accreditation Program: Hospital National Patient Safety

Goals for 2011 included new goals for inpatient hospital units. The following is a complete list of the 2011 goals as stated by the Joint Commission (2010) effective January 1, 2011:

1. Improve the accuracy of patient identification.
2. Improve the effectiveness of communication among caregivers.
3. Improve the safety of using medications.
4. Reduce the risk of health care-associated infections.
5. Accurately and completely reconcile medications across the continuum of care.
6. The hospital identifies safety risks inherent in its patient population.

As of October 1st, 2008 The Centers for Medicare and Medicaid Services (CMS) no longer pays a higher reimbursement for hospitalizations complicated by the following conditions (referred to as “never-events) if they were not present upon admission:

Foreign object retained after surgery, air embolism, blood incompatibility, pressure ulcers (stages III and IV), falls, manifestations of poor glycemic control, catheter-associated urinary tract infection, vascular catheter-associated infection, deep vein thrombosis/pulmonary embolism associated with knee or hip replacement, and surgical site infection (certain procedures) (Centers for Medicare and Medicaid Services, 2008). Many commercial insurers followed with refusing to reimburse for never-events (Miller, 2009).

Nursing Work Environment

In 1983 the original Magnet Hospital study was published citing factors that help attract and retain nurses in the health care system (McClure, Poulin, Sovie, & Wandelt, 1983). Follow-up studies of these hospitals in the 1980s and 1990s contributed evidence to support that the cited factors earned the hospitals a reputation for excellence in nursing practice (Havens & Aiken, 1999). The work environment created by “Magnet” institutions attracted professional nurses by creating a work environment that rewarded quality nursing services (American Nurses Credentialing Center, n. d.). Studies have substantiated improved patient outcomes in organizational environments that are supportive of professional nursing practice (Aiken, Havens & Sloan, 2000).

In 2008 the ANCC developed a new model for the Magnet Recognition Program to provide a framework for nursing practice and research used to guide organizations seeking Magnet recognition (American Nurses Credentialing Center, n. d.). According to the ANCC (n. d.), the new model provided clarity and direction and eliminated redundancy within the Forces of Magnetism, configuring the fourteen forces into five Model Components. The model was simpler with a greater focus on measuring outcomes (American Nurses Credentialing Center, n. d.). The five Model Components were: Transformational Leadership, Structural Empowerment, Exemplary Professional Practice, New Knowledge, Innovation & Improvements, Empirical Quality Results (American Nurses Credentialing Center, n. d.). The fourteen Forces of Magnetism remain as the foundation to the Magnet Recognition Program.

Transformational leadership is an important aspect of the health care environment; a transformational leader leads people to where they need to be to meet the

demands of the future. The transformational leader has vision, influence, clinical knowledge, and expertise in the practice of professional nursing. The organization's leadership team creates the vision for the future, and guides the systems and environment to achieve the mission. This model component has changed from being used to solve problems, fix broken systems and empower staff to more of a transforming force to prepare organizations for the future. The Forces of Magnetism represented by this component were: Quality of Nursing Leadership (Force #1), and Management Style (Force #3) (American Nurses Credentialing Center, n. d.).

Structural Empowerment represents structures and processes developed to provide an innovative environment where strong professional practice flourishes and the mission, vision, and values come to life to achieve the outcomes important to the organization. This component includes the strong relationships and partnerships developed in the community to improve health outcomes. These goals are accomplished through the strategic plan, structure, systems, policies and programs. With education, and the empowerment of nursing staff to accomplish goals and achieve desired outcomes. The Forces of Magnetism represented by this Component included: Organizational Structure (Force #2), Personnel Policies and Programs (Force #4), Community and the Health Care Organization (Force #10), Image of Nursing (Force #12), and Professional Development (Force #14) (American Nurses Credentialing Center, n. d.).

Exemplary Professional Practice refers to the comprehensive understanding of the role of nursing, and the use of new knowledge and evidence. The goal of this component included the development of strong professional practice and the achievements of the professional practice. The Forces of Magnetism represented by this component were:

Professional Models of Care (Force #5), Consultation and Resources (Force #8), Autonomy (Force #9), Nurses as Teachers (Force #11), and Interdisciplinary Relationships (Force #13) (American Nurses Credentialing Center, n. d.).

New Knowledge, Innovation & Improvements include strong leadership, empowered professionals, and exemplary practice that contributes to patient care, the organization and the profession of nursing, by seeking new knowledge, innovations and improvements to the work environment. This component included new models of care, application of existing evidence, new evidence and visible contributions to the science of nursing in order to redesign and redefine current systems and practices. The Forces of Magnetism represented by this Component was Quality Improvement (Force #7) (American Nurses Credentialing Center, n. d.).

Empirical Quality Results represented the focus on outcomes. The Magnet recognition process traditionally focused on structure and processes, and assumed that improved outcomes would follow. The focus is shifting to measuring outcomes to demonstrate effectiveness of the structure and processes in place within the organization. The outcomes need to be categorized in terms of clinical outcomes related to nursing, the workforce, the patient, and the organization. Outcomes already being collected can be used and quality benchmarks established. This information was to be used to demonstrate excellence in Magnet recognized organizations. The force of magnetism represented by this component is Quality of Care (Force #6) (American Nurses Credentialing Center, n. d.).

The Joint Commission assembled a multi-disciplinary expert roundtable on the nursing shortage to investigate the problem and to construct possible resolutions and

recognize accountabilities for the solutions (The Joint Commission, 2002). The roundtable participants concentrated on the principal factors that have added to the shortage, the increasing threat of the nursing shortage to patient safety, and the priority resolutions most likely to provide for a stable nursing workforce in the future. One of the main recommendations suggested for transforming the workplace was to implement the characteristics of Magnet hospitals to promote an environment that empowers and is respectful of nursing staff (The Joint Commission, 2002).

In 2001, the American Association of Critical-Care Nurses made a commitment to endorse the establishment of healthy work environments that support and foster excellence in patient care wherever acute and critical-care nurses practice. The AACN (2005) reported that there was evidence that unhealthy work environments contributed to errors, ineffective care delivery, and conflict and stress among health professionals. They recommended the creation of healthy work environments to ensure patient safety, enhance staff recruitment and retention, and maintain an organization's financial viability (American Association of Critical Care Nurses, 2005).

The AACN identified six essential standards for establishing and sustaining a healthy work environment that represented evidence-based and relationship centered principles of professional performance (American Association of Critical Care Nurses, 2005, p. 12). The standards published in *The AACN Standards for Establishing and Sustaining Healthy Work Environments* (2005) are Skilled Communication, True Collaboration, Effective Decision Making, Appropriate Staffing, Meaningful Recognition, and Authentic Leadership (p. 13).

In Skilled Communication, nurses should be as proficient in communication skills as they are in clinical skills. Communication and interaction between professionals involved in the care of a patient was critical for the well-being and safety of the patient (American Association of Critical Care Nurses, 2005).

True Collaboration was an ongoing process that built over time, resulting in a work environment where there was a culture where joint communication and decision making between nurses and other health care professionals was the norm. For true collaboration to be effective, the special knowledge and abilities of each professional must be respected in order to achieve safe, quality patient care (American Association of Critical Care Nurses, 2005).

Effective Decision Making by nurses was identified as important for the provision of safe and quality care for the patients. Nurses are advocates for patients, nurses must be involved in the decisions regarding patient care. Nurses are accountable for patient safety, and therefore should be involved in organizational decision-making. Failure to incorporate the clinical perspective of nurses in clinical and operational decisions can result in costly errors that threaten patient safety (American Association of Critical Care Nurses, 2005).

Appropriate Staffing ensured an effective match between patient needs and nurse competencies. Staffing is complex, matching the needs of patients throughout their illness with the skills and competencies of nurses is critical. As patients' conditions often fluctuate, staffing flexibility is important (American Association of Critical Care Nurses, 2005).

Meaningful Recognition was mutual recognition between nurses and others for the value that each brings to the work of the organization. Everyone contributes in a unique way and should be valued for what they do. Recognition should be genuine and relevant to the individual. Meaningful recognition was a process that built over time becoming part of the work culture (American Association of Critical Care Nurses, 2005).

Authentic Leadership was the ability for nurse leaders to be genuine and fully embrace the imperative of a healthy work environment and engage others in its achievement. This required skilled leaders that have been educated and supported as leaders and are involved in decision making within the organization (American Association of Critical Care Nurses, 2005).

The AACN also has critical elements for each standard that include education, support, policies, systems and processes that reflect a healthy work environment, evaluation, research, recognition, technology, participation, accountability, communication and accessibility (American Association of Critical Care Nurses, 2005).

The American Association of Colleges of Nursing developed “Hallmarks of the Professional Practice Environment” (n. d.) that were characteristics of the practice setting that best support nursing practice and allow nurses to practice at their full potential. The following is a summary of these characteristics:

1. Manifest a philosophy of clinical care emphasizing quality, safety, interdisciplinary collaboration, continuity of care, and professional accountability.
2. Recognize contributions of nurses’ knowledge and expertise to quality of clinical care and patient outcomes.
3. Promote executive level nursing leadership.

4. Empower nurses' participation in clinical decision-making and clinical care organization.
5. Maintain clinical advancement programs based on education, certification, and advanced preparation.
6. Demonstrate professional development support for nurses.
7. Create collaborative relationships among members of the health-care team.
8. Utilize technological advances in clinical care and information systems.

The Institute of Medicine (IOM) is an interdisciplinary advisory board to the nation on issues impacting health care (Institute of Medicine of the National Academies, n. d.). The IOM has a history of making recommendations for improving health care that have had a profound impact on stimulating change. Past reports that have significantly affected health care include; *To Err is Human: Building a Safer Health System* (1999), *Crossing the Quality Chasm: A New Health System for the 21st Century* (2001), *Health Professions Education: A Bridge to Quality* (2003), and *Keeping Patients Safe: Transforming the Work Environment of Nurses* (2004). The most current report is *The Future of Nursing* (2010), that evaluates nursing's' role in transforming the system of health care delivery. According to the IOM report (2010)

A number of barriers prevent nurses from being able to respond effectively to rapidly changing health care settings and an evolving health care system. These barriers need to be overcome to ensure that nurses are well- positioned to lead change and advance health" (p.1).

The report included the following relevant key messages:

- Nurses should practice to the full extent of their education and training.

- Nurses should achieve higher levels of education and training through an improved education system that promotes seamless academic progression.
- Nurses should be full partners, with physicians and other health care professionals, in redesigning health care in the United States.
- Effective workforce planning and policy making require better data collection and information infrastructure.
- Patient safety, nursing-sensitive patient outcomes and a healthy work environment for nurses are critical aspects of the following integrative literature review on the relationship between healthy work environment and nursing-sensitive patient outcomes. Taking a close look at how these concepts are defined, it is easy to see how they are related and that the evidence is pointing toward establishing healthy work environments for nurses in order to create improved patient outcomes.

Beginning with the work of Florence Nightingale (1969), evidence on work environments in health care settings consistently reported that there was a need to reduce errors, improve patient safety and help create an environment that promoted healing. It was also clear in this literature that nurses continue to play a critical role in maintaining the health and promoting healing in patients. Florence Nightingale was the first documented source advocating for the education of nurses and for improved communication and collaboration between members of the health care team (Pfettsher, 2006). In the years since Nightingale initially wrote about the environment and the profession of nursing, evidence has pointed toward the same basic principles for establishing and maintaining professionalism and a healthy work environment

(American Nurses Association, N.D., American Association of Critical Care Nurses, n. d.).

Experts seem to agree that important components exist to create a work environment that promotes professionalism and patient safety. It was evident in the information provided in this introduction that the industry has defined and established nursing-sensitive patient outcomes, healthy work environment for nursing, and patient safety goals. The unanswered question is, do healthy work environments actually effect nursing sensitive patient outcomes and ultimately patient safety? The following review of literature attempts to answer that question.

Theoretical Framework

Florence Nightingale's Philosophy of Nursing

Florence Nightingale (1820 – 1910) is considered the founder of modern nursing (Lobo, 1995). Nightingale's theory focused on the environment; Fitzpatrick and Whall described Nightingale's concept of environment as "those elements external to and which affect the health of the sick and the healthy person" (1983, p. 16-17). Nothing in the patient's world was excluded from her description of environment. She never used the word environment, however she used concepts that are considered parts of the environment. She did not separate the patient's environment into physical, emotional or social aspects; she included these aspects into the overall environment. She believed that healthy surroundings were necessary for proper nursing care (Pfettsher, 2006).

A component of Nightingale's theory was "petty management". This referred to the fact that the nurse was in control of the environment, physically and administratively

(Nightingale, 1969). The nurse was charged with protecting the patient from physical and psychological harm (protection from receiving bad news from visitors, being disrupted in their sleep, environmental factors and nursing errors) (Pfettsher, 2006), maintaining a therapeutic atmosphere and creating an environment that enhanced and contributed to recovery.

Nightingale supported the education of nurses, emphasizing the use of observation and the performance of tasks in educating nurses and expected them to continue to use these activities in practice (Pfettsher, 2006). Nightingale wrote *Notes on Nursing* in 1859 to train nurses to care for sick people, it was first published in the United States in 1960. In this book she asserted that nurses need to be observers of patients and their environment. She also stated in the book that nurses needed to use common sense in their nursing practice, along with observation, perseverance and ingenuity (Nightingale, 1969).

Nightingale wrote about nurses being “moral agents”, addressing their professional relationship with patients; she instructed on the principles of confidentiality and being a patient advocate (Pfettsher, 2006). She thought it was important for nurses and physicians to work together and called for concise and clear decision making, encouraging nurses to give physicians “not your opinion, however respectfully given, but your facts” (Nightingale, 1969, p. 122).

Nightingale’s beliefs about nursing, environment and leadership are similar to the components of a healthy work environment today. She believed in nurse engagement, education, collaboration, autonomy and leadership. Her leadership qualities included: Commitment to a clear mission; engagement, being fully present and actively

participating; courage to stand up for what she believed; attitude of respect and hope; reverence for human dignity; perspective to see improvement; initiative to overcome obstacles; and pride in the nursing profession (Hegge, 2011).

Donabedian's Structure, Process, Outcome Framework

Donabedian's (1980) theoretical framework, ("Structure-Process-Outcome") (S-P-O) to assure quality of care, was also used to guide the theoretical aspect of this integrative literature review. This theoretical framework integrated the relationship of structure and process variables on outcome. Structure was the physical and organizational properties of the environment. Included in this are human resources such as the qualifications and skills of staff and administrators. Process was a series of actions or operations conducting to an end, including interpersonal care, technical aspects, and relationships involved in the care. Outcomes were the end result of care, and included the effect of processes on staff and patients (Donabedian, 1980).

Outcome indicators included: mortality, adverse or positive patient reactions, nursing-sensitive patient outcomes, and nurse outcomes. Donabedian, (1980) further clarified that outcomes were the results or consequences of process actions. Structure and process were proposed to influence outcomes and are causally related. Structure leads to process, and process to outcome.

Donabedian (1980) defined quality of care as "the extent to which the care provided is expected to achieve the most favorable balance of risks and benefits. Furthermore, to the extent that the interpersonal process contributes to the failure or success of technical care" (Donabedian, 1980, p.5). He also stressed that there was a

difference in opinion on the definition of quality of care depending on the person's point of view (Donabedian, 1980).

The American Nurses Association used Donabedian's Structure, Process, and Outcome framework to describe nursing care. According to the ANA, "nursing-sensitive indicators reflect the structure, process and outcomes of nursing care." (American Nurses Association, n. d.). The structure of nursing care was defined by the supply of nursing staff, skill level and education/certification of nursing staff. Process indicators were those that measured nursing care such as assessment, intervention, and registered nurse (RN) job satisfaction. Patient outcomes that are considered to be nursing-sensitive were those that improved if there was a greater quantity or quality of nursing care, examples include pressure ulcers, falls and intravenous (I.V.) infiltration (American Nurses Association, n. d.).

Donabedian's model provided a framework for patient safety, and allowed the examination of risks rooted within the structure of health care that could cause harm to the patient with individual or team failures being identified as a leading cause of undesirable patient outcomes (AHRQ, 2011.). Donabedian's Structure-Process-Outcome paradigm was used to analyze the advancement, research and development of the concept of magnetism (Kramer & Schmalenberg, 2005).

The Donabedian Model was modified in 1980 to include conditions that could affect patient outcomes (Coyle & Battles, 1980). It has been suggested that patient and environmental factors were important to understanding the effectiveness of changes made in the process of care, with the idea that improved patient outcomes is the ultimate goal of any change (Coyle & Battles, 1980).

Irvine developed the nursing role effectiveness model, that included Donabedian's work (Structure, Process, Outcome) and emphasized the individual nurse, the health care organization, patient centered outcomes or how nursing actions influenced the patient (Irvine, Sidani & McGillis, 1998). Duffy's "Quality - Caring Model" incorporates aspects of Donabedian, and Irvine's work with special emphasis on nursing's role for improving patient outcomes. (Duffy & Hoskins, 2003).

Significance of the Project

Many hospitals are striving to become Magnet Designated Facilities with the goals of attracting and retaining nurses, creating and maintaining a healthy work environment, and improving patient outcomes. However, very few studies have actually followed up to see if in fact a healthy work environment is having and affect on patient outcomes. The AACN, (2005) emphasized that the creation of a healthy work environment was imperative to ensuring patient safety, enhancing staff recruitment and retention and maintaining an organization's financial viability.

The findings of this integrative literature review adds to the body of knowledge on nurses' work environment and nursing-sensitive patient outcomes. It provides a summary for nursing administrators, so they can examine the results and make decisions on practice changes related to healthy work environment.

Research Question

Is there evidence in the literature that suggests that a healthy work environment for nurses results in an improvement in nursing-sensitive patient outcomes?

Limitations

The time frame for this integrative literature review was approximately one year. Research that was in progress at this time would have been missed because it had not yet been published. In addition, 'healthy work environment' is a relatively new movement that has been implemented in hospitals. As a result the time between implementation, evaluation and publication of results could take 5 years or more.

Definitions of Terms

Appropriate staffing – Staffing must ensure the effective match between patient needs and nurse competency (American Association of Critical Care Nurses, 2005).

Authentic leadership – Nurse leaders must embrace the imperative of a healthy work environment, authentically live it and engage others in its achievement (American Association of Critical Care Nurses, 2005).

Critical elements – Structures, processes, programs and behaviors required for a standard to be achieved (American Association of Critical Care Nurses, 2005).

Culture of safety – The product of individual and group values, attitudes, competencies and patterns of behavior that determine the commitment to, and the style and proficiency of an organization's health and safety management (Health and Safety Executive Research Report, 2005).

Effective decision making – Nurses must be valued and committed partners in making policy, directing and evaluating clinical care and leading organizational operations (American Association of Critical Care Nurses, 2005).

Essential – Absolutely required; not to be used up or sacrificed. Indispensable. Fundamental (American Association of Critical Care Nurses, 2005).

Meaningful recognition – Nurses must be recognized and must recognize others for the value each brings to the work of the organization (American Association of Critical Care Nurses, 2005).

Outcome – The effects of care on the health status of patients and populations. Indicators of quality of the end result, that is, what actually happens to the patient (Donabedian, 1980).

Process – What is actually done in giving and receiving care. It includes the patient's activities in seeking care and carrying it out as well as the behaviors and practices of health care providers (Donabedian, 1980).

Skilled Communication - Having familiar knowledge united with readiness and dexterity in its application. it is a two-way dialogue in which people think and decide together. Nurses must be as proficient in communication skills as they are in clinical skills (American Association of Critical Care Nurses, 2005).

Standard – Authorative statement articulated and promulgated by the profession, by which the quality of practice, service or education can be judged (American Association of Critical Care Nurses, 2005).

Structure – The attributes of the settings in which care occurs. This includes the attributes of material resources, human resources and organizational structure. (Donabedian, 1980).

True Collaboration - is a process, not an event. It must be ongoing and build over time, eventually resulting in a work culture where joint communication and decision

making between nurses and other disciplines and among nurses themselves becomes the norm. Nurses must be relentless in pursuing and fostering true collaboration (American Association of Critical Care Nurses, 2005).

Assumptions

Methodological assumptions of this integrative literature review include: the following. The search of existing literature will provide a summary of relevant data that will facilitate a better understanding of the relationship between healthy work environment characteristics and nursing-sensitive patient outcomes. Research findings will be applicable to current work environments and will provide an awareness of how implementing a healthy work environment will affect patient safety trends in an organization.

CHAPTER 2

SEARCH METHODS

Literature Search

The goal of the data collection stage was to conduct an exhaustive review of the literature and collect a set of relevant articles that meet specific inclusion criteria. A systematic plan was devised for data collection and the method of collection clearly described and accurately documented (Randolph, 2009).

Many references pertaining to integrative literature reviews suggest that electronic data base searches lead to between 10 to 50 percent of articles in an exhaustive review (Randolph, 2009; Whittemore & Knafl, 2005). Other methods used included hand searching references of articles that were excluded, review articles and dissertations reporting on healthy work environment or Magnet recognition; using references found on the ANCC Magnet website, and searching the AHRQ patient safety network, the ANA, and Medscape.

Inclusion/Exclusion Criteria

Each article title and abstract was reviewed to determine inclusion criteria, if an article could not be eliminated by reading the abstract; the article was reviewed in further detail. The first criterion established was to include research studies measuring the outcome of a healthy work environment (HWE) on nursing-sensitive patient outcomes (NSPO) in an in-patient hospital setting. More specifically the study must have include at least two HWE standards and both factors could not be related to staffing i.e. skill mix,

RN hours per patient day, or RN certification/education) or Magnet status. There was an overwhelming body of research comparing nurse staffing to patient outcomes. In order to focus on healthy work environment rather than staffing or individual nursing qualities such as level of education, the literature review excluded studies focused primarily on staffing measures or individual nurse characteristics. The outcomes must have been measured in nursing-sensitive patient outcomes as defined in the previous chapter.

Only peer-reviewed journals were accessed to ensure quality and accuracy. An exhaustive review of the literature was conducted including articles dating back as far as possible(1994). Case reports, antidotes, clinical descriptions and unpublished research findings were used as resources to support the findings and were not included in the data analysis, as they do not include measureable outcomes. Studies relying on subjective outcome information from nurse or patient survey were also excluded for the same reasons.

To summarize the process, studies were limited to those utilizing statistical data from actual patient outcomes and evaluating whether nursing healthy work environment or Magnet status of a unit/hospital affected the patient outcomes. A discussion of search methods and findings follows.

Search Methods

Databases. An electronic search was completed using the following databases: the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medical Literature On-Line (MEDLINE), The Agency for Health care Research and Quality

Patient Safety Network (AHRQ PSN), and The Robert Wood Johnson Foundation publications on-line database.

Search Terms. The search terms used were the following: *nurse/nursing sensitive patient outcomes, healthy work environment, patient outcomes, quality indicators, Magnet recognition, Magnet hospitals, and quality of nursing care.*

Supplemental Search Methods. The references of several review articles and studies that did not meet inclusion criteria were hand-searched, as well as articles referenced on the ANCC Magnet website. The American Nurses' Association (ANA) website, Medscape, National Quality Forum and NurseZone websites were also searched for relevant articles.

Findings

CINAHL. A search in CINAHL using the term *nurse-sensitive patient outcomes* produced twenty-one results; nine of those were further reviewed for inclusion criteria, none of these studies met inclusion criteria. Using the terms *healthy work environment and patient outcomes* ten articles were produced, one met inclusion criteria. The terms *Magnet recognition and patient outcomes* yielded ten articles, 4 were further reviewed and one met inclusion criteria. The terms *quality of nursing care and patient outcomes* yielded two hundred sixty-two results, twenty-nine were further reviewed and one met inclusion criteria. The terms *quality indicators and nursing care* yielded one hundred eighty articles, six were further reviewed and none met inclusion criteria. The terms *Magnet hospitals and patient outcomes* yielded sixty-eight articles, fifteen were not

duplicate and were further reviewed, one met inclusion criteria. The three articles that met inclusion criteria are detailed in Table 1. The articles that were excluded were studies that relied on nurse report of patient outcomes and studies that were focused on poor work environment and how they result in poor outcomes as well as studies that focused on staffing.

Table 1. CINAHL Studies Meeting Inclusion Criteria

Author Location Year	Design	Purpose	Sample	HWE	NSPO
Capuano, Bokovoy, Hitchings, & Houser USA (2005)	Mixed method	Evaluate impact of HWE to NSO to determine what can be modified	70 patient care units at Magnet hospitals	Leadership, resources, staff-expertise, staff-stability, teamwork	HA pneumonia, HA UTI, Mortality, Medication Errors, Patient Falls
Kooker & Kamikawa Hawaii (2009)	Mixed method	Examine the effects of Magnet standards on Pt. outcomes	4 nursing units	ANCC Magnet standards	Nosocomial pressure ulcers
Aiken, Smith & Lake USA (1994)	Observation al matched comparison	Examine mortality rates for Magnet and non-Magnet	234 Hospitals	ANCC Magnet standards	Mortality

MEDLINE: A search of MEDLINE using the same terms as the previous search resulted in many duplicate results. When searching the term *nurse-sensitive patient outcomes* there were 40 results with one new article that met inclusion criteria. The terms *healthy work environment and patient outcomes* led to seven articles, no new articles that met inclusion criteria. The terms *Magnet recognition and patient outcomes* resulted in five articles with no new articles that met inclusion criteria. When the terms *quality of*

nursing care and patient outcomes was searched, twenty-three results were yielded, one of them met inclusion criteria. The terms *quality indicators and patient care* yielded two-hundred and fifty-two results with five new articles that were reviewed further with one meeting inclusion criteria. The terms *Magnet hospitals and patient outcomes* yielded sixteen articles, three were further reviewed and none of them met inclusion criteria. The two studies that met inclusion criteria are listed in Table 2.

AHRQ PSN: A search of the electronic database of patient safety literature on the AHRQ patient safety network did not result in any studies that met inclusion criteria. There were some duplicate articles found, a result of searching this database last.

The Robert Wood Johnson Foundation: A search of the RWJF electronic database of literature relating to patient safety, nursing care and patient outcomes did not result in any articles that met inclusion criteria. The database included many review articles and initial findings from internal grant funded studies that were not published or peer reviewed. One study was previously included from another source.

Table 2. Medline Studies meeting Inclusion Criteria.

Author Location Year	Design	Purpose	Sample	HWE	NSPO
Chaboyer, Johnson, Hardy, Gehrke, & Panuwatwanich Australia (2010)	Observation time-series study	Examine effects of transforming care at bedside on NSPO	2 medical units	Transforming care improvement strategies	Med errors, falls, pressure ulcers
Wolfe, et al. USA (2008)	RCT	Determine if patient centered care affects quality outcomes	116 patients	Patient centered care, communication skills	Falls, infections, postop comp.

Hand Search. Hand searching review articles and studies that did not meet inclusion criteria enhances the rigor of the literature review. Thirty-three review articles and seventy-seven studies were hand searched, leading to four relevant studies that met inclusion criteria. Many studies found were either duplicate of previously included studies. Most articles found on the ANA, NurseZone, and Medscape websites were review articles leading to the studies that have already been included in this literature review. The Magnet website had 33 articles, four were closely reviewed and three met inclusion criteria. Most of the Magnet articles were looking at staff satisfaction and retention as opposed to patient outcomes. Table 3 lists the studies found using hand searches. Table 4 lists the studies found on the Magnet website.

Table 3. Hand-search Studies Meeting Inclusion Criteria

Author Location Year	Design	Purpose	Sample	HWE	NSPO
Lake, Shang, Klaus, & Dunton USA (2010)	Retro Cross-sectional study	Examine the relationship between Magnet status, staffing and pt. falls	5,388 nursing units in 636 hospitals	AANC Magnet status, nursing staffing and education level	Pt. falls
Solomita USA (2009)	Dissertation Exploratory cross-sectional study	Determine relationship between Magnet status and NSPO	1003 hospitals	Magnet status, nurse staffing & organizational characteristics	Pressure ulcers, surgical death, postop resp. fail, postop DVT/PE, postop sepsis
Shortell, et al. USA (1994)	Mixed method	Determine if good management affects patient outcomes	42 ICUs	Culture, leadership, coordination, communication and conflict management abilities.	Length of stay. mortality
Aiken, Sloane, Lake, Sochalski, & Weber USA (1999)	Observational matched comparison study	Compare differences in AIDS mortality in dedicated units and Magnet hospitals	40 units	Magnet status, nurse to patient ratios, specialty education, nurse autonomy.	Mortality

Table 4. Magnet Website Studies Meeting Inclusion Criteria

Author Location Year	Design	Purpose	Sample	HWE	NSPO
Stone, et al. USA (2007)	Observational study with data collection	Examine the effects of working conditions on NSPO	51 ICUs in 31 hospitals elderly patients	Organizational climate, nurse staffing	CLBSI, VAP, CAUTI, mortality and pressure ulcers
Aiken, Clarke, Sloane, Lake, & Cheney USA (2008)	Mixed method	Analyze the effects of nurse practice environments on nurse and patient outcomes	10184 nurses 232,342 surgical patients at 168 hospitals	Care environment as measured using Nursing Work Index	Mortality & Failure to rescue
Friese, Lake, Aiken, Silber, & Sochalski USA (2007)	Secondary analysis	Examine effects of nursing practice environments on cancer patient outcomes	25,957 cancer patients, 164 nursing units	Nurse staffing ratio, nurse education, practice environment measured using Nursing Work Index	Mortality, complications & failure to rescue

In summary, this integrative review was directed by the approach proposed by Whittemore and Knafl (2005). A systematic review of the literature was conducted via the electronic databases of CINAHL, MEDLINE, AHRQ PSN and The Robert Wood Johnson Foundation, using selected key words. Supplemental search methods included a hand search of relevant bibliographies, and an electronic search of ANCC's Magnet website. After critiquing research findings, twelve articles were selected for inclusion in the literature review. The following chapter provides a description of the data analysis methods.

CHAPTER 3

DATA ANALYSIS METHODS

Evaluation of Data

According to Whitemore and Knafl (2005), data analysis in research reviews requires that data from primary sources are ordered, coded, categorized and summarized into a unified and integrated conclusion about the research problem; a thorough and unbiased interpretation of primary sources, along with an innovative synthesis of the evidence are the goals of the data analysis stage (p. 3). The process of data analysis in this review included using a constant comparison method as recommended by Whitemore and Knafl, (2005). The studies were evaluated using the following strategies: overall quality, data reduction, and identification of patterns, themes, variations and relationships. They were then further analyzed and synthesized using; data display, data comparison, conclusion drawing and verification.

Quality of Research

Quality was defined in terms of the internal validity of the studies, or the extent to which the design, conduct and analyses minimized errors and biases. It is important to have standard, reproducible criteria to critically appraise the quality of the studies. The studies were evaluated using a research appraisal tool developed by Kmet, Lee and Cook (2004) (See Appendix A). A score was given to each study based on this tool, however due to a small sample size, studies were not excluded based on the score.

The QualSyst tool (appendix A) was chosen because it could assess the quality of diverse study designs. The QualSyst tool was drawn from existing published tools; the tool was tested with high inter-rater reliability. The limitations of the tool include; the use of summary scores to identify high quality studies can introduce bias into a review of literature, if used to exclude lower quality studies, the absence of a “gold standard tool” to compare, and inter-rater reliability is limited due to a small number of studies tested with the tool (Kmet, Lee & Cook, 2004). The scoring system provides systemic, reproducible and quantitative assessment of the quality of research encompassing a broad range of study designs, while assisting in the exploration of variation across studies and in the synthesis and interpretation of research findings (Kmet, Lee & Cook, 2004).

Data Reduction

The studies were then organized based on study design, sample size/setting, healthy work environment factor, nursing-sensitive patient outcome measured, and major findings. A display table was used to display pertinent information to facilitate data comparison between studies (Appendix B). The data was further evaluated using techniques of extracting and categorizing data from the included literature in order to simplify and organize the data. Relevant data was compiled in tables for efficient comparison of specific issues, characteristics and variables. Initial categories were established, including demographic characteristics, type of article/study, methodology used, research design, independent variables examined, dependent and mediating measures examined, moderating variables examined, and measures used.

Data Display

The data is displayed in tables to enhance the visualization of patterns and relationships within and across primary data sources. The charts should make it easier to interpret the data and identify patterns, themes and relationships. The data was categorized into subgroups as described in the data reduction stage.

Data Comparison

Data comparison is the process of examining the data that has been displayed in the charts to identify patterns, themes, or relationships (Whittemore and Knafl, 2005). Whittmore and Knafl contend that the process includes establishing patterns and themes, seeing plausibility, clustering, counting, making contrasts and comparisons, noticing patterns, and building a chain of evidence (p. 4). Similar data was grouped together for further comparison.

Identification of Patterns, Themes, Variations and Relationships

Data were organized using tables identifying patterns, themes, variation and relationships. Whittmore and Knafl (2005) suggested organizing data in a matrix or spreadsheet by sub classification to facilitate systematically comparing primary sources on specific issues, variables, or sample characteristics (p. 3). These tables are included in the presentation of findings. Gaps in the literature and discrepancies were identified by comparing data between the primary research articles.

Conclusion Drawing and Verification

According to Whitmore and Knafl, conclusion drawing and verification is the last phase of data analysis, moving from describing patterns and relationships to higher levels of abstraction, subsuming the particulars into the general (p.5). Conclusions were developed and revised to include as much data from the included articles as possible. Verification with primary sources for accuracy and confirmability was done for discernment of patterns, themes, relationships and conclusions, making sure to include all pertinent evidence. The subgroups were combined for a final analysis and an integrated summation of the topic completed the review process.

CHAPTER 4

PRESENTATION OF FINDINGS

Overview

Twelve studies met inclusion criteria and were compiled, organized by theme and analyzed based on similarities and differences. Data reduction information can be found in Appendix B. This chapter begins with a summary of the findings and continues with an analysis of the data collected from the included studies. The data is examined, discrepancies and gaps in literature are discussed and conclusions are drawn based on the patterns found in the literature.

Summary of LiteratureQuality

Evaluating the quality of the literature entails an assessment of the title, abstract, problem statement, review of the literature, methods, design, data analysis, discussion and overall style (Fain, 2008). Each study that met inclusion criteria was evaluated for quality using the QualSyst tool (Appendix A). Studies were not excluded based on the score; they all had relatively high quality scores.

The quality scores from highest to lowest were: Wolfe et al. (2008), Aiken, Smith & Lake (1994), Kooker & Kamikawa (2009), Capuano et al. (2005), Frieze et al. (2007), Chaboyer et al. (2010), Shortell, et al. (1994), Lake et al. (2010), Aiken et al. (1999), Solomita (2009), Stone et al. (2007), Aiken et al. (2008). See Table 5 for quality scores.

Table 5. Quality Scores

Study	Quality Score
Wolfe et al. (2008)	22/22
Aiken, et al.(1994)	22/22
Kooker & Kamikawa(2009)	22/22
Capuano et al. (2005)	20/22
Frieze etal. (2007)	20/22
Chaboyer et al. (2010)	20/22
Shortell, et al. (1994)	20/22
Lake et al. (2010)	19/22
Aiken et al.(1999)	19/22
Solomita (2009)	19/22
Stone et al.(2007)	19/22
Aiken et al. (2008)	19/22

Themes

The studies were organized into tables to expedite recognition of themes. A table accompanies each discussion associated with identified themes. The themes identified and presented include 1) location (table 6), 2) design (table 7), 3) population (table 8), 4) sample size (table 9), 5) outcome measures (NSPO) (table 10), 6) type of healthy work environment (table 11), 7) measurement of healthy work environment (table 12).

Research Findings Based on Themes

Study Location

The majority of the studies (n=11;92%)analyzed in this literature review were conducted in the United States. Only one study meeting inclusion criteria was conducted outside the United States; Chaboyer et al (2010), was conducted in Australia. Table 6 summarizes the locations.

Table 6. Location

United States	Unites States	Australia
Wolfe et al. (2008)	Aiken et al. (1999)	Chaboyer et al. (2010)
Aiken, et al. (1994)	Aiken et al. (1999)	
Kooker & Kamikawa (2009)	Solomita (2009)	
Capuano et al. (2005)	Stone et al. (2007)	
Frieze et al. (2007)	Aiken et al. (2008)	
Shortell, et al. (1994)	Lake et al. (2010)	

Study Design

The included studies varied in their design and data collection methods (Table 7). One study was a randomized-control trial (Wolf et al. 2008). Four studies used a mixed method (Capuano et al. 2005, Aiken et al., 2008, Kooker & Kamikawa, 2009, and Shortell et al., 1994). Observational studies were employed in four studies (Stone et al., 2007, Aiken et al., 1994, Chaboyer et al., 2010, Aiken et al., 1999). The observational studies varied between observational matched comparison, observational with data collection, and observational time series studies. One study was a secondary analysis (Frieze et al., 2007). One study was a retrospective cross-sectional study (Lake et al., 2010). One study was exploratory cross-sectional design (Solomita, 2009).

Table 7. Study Design

Randomized Control-trial	Mixed Method	Observational	Secondary Analysis	Cross-sectional
Wolf et al. (2008)	Capuano et al. (2005)	Stone et al. (2007)	Frieze et al. (2007)	Lake et al. (2010)
	Aiken et al. (2008)	Aiken et al. (1994)		Solomita (2009)
	Kooker & Kamikawa (2009)	Chaboyer et al. (2010)		
	Shortell et al. (1994)	Aiken et al. (1999)		

Study Populations

All of the studies that met inclusion criteria studied work environment and patient outcomes in inpatient hospital settings. These settings ranged from an entire hospital to ICU units exclusively. Studies that examined data from ICUs include: Stone et al. (2007), Shortell et al. (1994), studies comparing at the hospital level include: Capuano et al. (2005), Aiken et al. (2008), Aiken, Smith & Lake (1994), Lake et al. (2010), and Solomita (2009). Two studies focused on the type of patients on dedicated specialty units, Frieze et al. (2007) examined cancer patients and Aiken et al. (1999) researched units dedicated to AIDS patients. The remaining studies examined work environments and patient outcomes at the unit level across various medical-surgical units including: Kooker & Kamikawa (2009), Chaboyer et al. (2010), and Wolfe et al (2008) (refer to Table 8).

Table 8. Study Population

Hospital	Specialty Unit	Medical-surgical unit	Intensive Care Units
Capuano et al (2005)	Frieze et al. (2007)	Kooker & Kamikawa (2009)	Stone et al. (2007)
Aiken et al. (2008)	Aiken et al. (1999)	Chaboyer et al. (2010)	Shortell et al. (1994)
Aiken et al. (1994) Lake et al. (2010) Solomita (2009)		Wolfe et al. (2008)	

Sample Size

The sample sizes varied from 116 patients to 232,342 patients. Some sample sizes were measured and reported by number of hospitals, some by number of nursing units and others by number of patients. All of the studies included either how many

hospitals were used or how many nursing units, not all of the studies reported actual patient numbers (refer to Table 9).

Table 9. Sample Size

Hospitals	Patient Care Units
Aiken et al. (1994) N=226	Capuano et al. (2005) N=70
Aiken et al. (2008) N=168	Stone et al. (2007) N=31
Solomita (2009) N=1003	Kooker & Kamikawa (2009) N=4
	Chaboyer et al. (2010) N=2
	Lake et al. (2010) N=5,338
	Aiken et al. (1999) N=40
	Frieze et al. (2007) N=164
	Wolfe et al. (2008) N=2
	Shortell et al. (1994) N=42

Outcome Measures

To meet inclusion criteria for this integrative literature review the studies must have measured nursing-sensitive patient outcomes patient falls, medication errors, health care associated infections, hospital acquired pressure ulcers, and postoperative complications [DVT, PE post-operative sepsis], as well as mortality and failure to rescue. The studies are listed in Table 10 according to what nursing-sensitive patient outcome they measured; those measuring more than one appear in multiple columns.

Mortality was included as an outcome measure because much of the significant older research used this as a measure before nursing-sensitive patient outcomes were defined (Aiken et al, 1994 &1999). The fact that the 30-day mortality rate was reduced

in Magnet hospitals shows that a healthy work environment penetrates all areas of care not only nursing (Aiken et al.,1994).

The studies are listed in Table 10 according to what nursing-sensitive patient outcome they measured. Studies measuring more than one appear in multiple columns.

Table 10. Nursing Sensitive Patient Outcomes

Falls	Med. errors	VAP, CLABSI & CAUTI	Pressure ulcers	Post-op complications	Mortality	Failure to rescue
Capuano et al (2005)	Capuano et al (2005)	Capuano et al (2005)	Stone et al. (2007)	Wolfe et al. (2008)	Capuano et al (2005)	Frieze et al. (2007)
Wolfe et al. (2008)	Chaboyer et al. (2010)	Stone et al. (2007)	Kooker & Kamikawa (2009)	Solomita (2009)	Stone et al. (2007)	Aiken et al. (2008)
Chaboyer et al. (2010)		Wolfe et al. (2008)	Chaboyer et al. (2010)		Frieze et al. (2007)	
Lake et al. (2010)			Solomita (2009)		Aiken et al. (2008)	
					Aiken et al. (1994)	
					Aiken et al. (1999)	
					Shortell et al. (1994)	

Type of Healthy Work Environment

The focus of this integrative literature review was to focus on healthy work environments. In order to narrow the review to include studies that examined components of the work environment, it was necessary to limit the studies to those examining two healthy work environment factors that were not associated with staffing

measures. While reviewing the literature many studies were quickly excluded because they only examined staffing and skill mix. As discussed in previous chapters a healthy work environment involves a diverse combination of factors and disciplines outside of nursing that affect the nursing environment of care.

According to ANCC standards, hospitals that have achieved Magnet status have demonstrated more than two healthy work environment standards in order to achieve Magnet designation (ANCC, n. d.). Thus, studies that compared Magnet hospital outcomes to non-Magnet hospital outcomes were included in this integrative literature review. Table 11 details the studies and related healthy work environment standards. Five studies (n=5; 41.6%) examined Magnet hospital standards compared to non-Magnet hospitals. One study (n=1; 8.3%) focused on patient outcomes when transforming care at the bedside strategies were used compared to when they were not. One study (n=1; 8.3%) implemented Patient Centered Care strategies, and also examined communication on the units. The remainder of the studies (n=5; 41.6%) involved more than one HWE factor.

Table 11. Healthy Work Environment Factor

Org. climate	Nurse staffing	Care environment (PES-NWI)	Communication	Magnet	Transforming Care at bedside	Autonomy	Leadership	Team work
Stone et al (2007)	Capuano et al. (2005)	Frieze et al. (2007)	Shortell et al. (1994)	Aiken et al. (1994)	Chaboyer et al. (2010)	Aiken et al. (1999)	Capuano et al. (2005)	Capuano et al. (2005)
Shortell et al. (1994)	Stone et al (2007)	Aiken et al. (2008)	Wolfe et al. (2008)	Kooker & Kamikawa (2009)			Shortell et al. (1994)	
Solomita (2009)	Frieze et al. (2007) Solomita (2009) Aiken et al. (1999) Lake et al (2010)			Lake et al (2010) Aiken et al. (1999) Solomita (2009)				

Measurement of Healthy Work Environment

The National Quality Forum (National Quality Forum, 2004) has endorsed the Practice Environment Scale of The Nursing Work Index (PES-NWI) as a nurse-sensitive indicator of work environment. It is a 49-item questionnaire that measures the presence of certain organizational attributes in a nurse's work setting (Kramer & Hafner, 1989). Three studies used PES-NWI include Aiken et al. (1994), Friese et al. (2007), and Aiken et al. (2008).

There were four studies (n= 4; 25%) that examined Magnet designation but did not use a standardized measurement tool (Solomita, 2009;; Kooker & Kamikawa, 2009; Lake et al., 2010), one that studied Magnet hospitals and used PES-NWI (Aiken et al., 1999). Five studies (n= 5; 41.7%) implemented techniques to improve nurse work environments and but did not utilize measurement tools (Shortell et al., 1994, stone et al., 2007, Chaboyer et al., 2010, Wolf et al., 2008, & Capuano et al., 2005) (refer to Table 12).

Table 12. Measurement Tool

PES-NWI	Magnet	None
Aiken et al. (1994)	Aiken et al. (1999)	Shortell et al. (1994)
Friese et al. (2007)	Solomita, (2009)	Stone et al. (2007)
Aiken et al. (2008)	Kooker & Kamikawa, (2009)	Chaboyer et al. (2010)
	Lake et al., (2010)	Wolfe et al. (2008)
	Aiken et al. (1999)	Capuano et al. (2005)

Discrepancies Found in the Review

The studies in this integrative literature review focused on nursing-sensitive patient outcomes. There are many possible reasons that negative patient outcomes may not be reported including, fear of disciplinary action, lack of time to complete paperwork, missed diagnosis of complication, and unwitnessed falls.

The studies used different measurement tools for determining healthy work environment standards, resulting in inconsistent results. The work environments were measured based on data collected by surveying nurses. This can be unreliable due to an inconsistent number of nurses completing the survey and varied perceptions of the work environment.

Patient outcomes are not solely dependent upon nursing care. Many other factors are involved including; age and health of patient, medical care, equipment, and hospital characteristics (such as teaching status). When using a randomized control study it was difficult to identify healthy work environments and unhealthy work environments on specific units especially if the units were in the same hospital with similar organizational characteristics.

Gaps in the Literature

The data available on this topic was limited as evidenced by the fact that a complete review of the literature from the earliest available article (1994) on the subject through 2011 resulted in only twelve studies meeting inclusion criteria. The gaps in the literature included 1) a lack of research on this topic from 1999 – 2004, 2) few studies

examined individual nursing units and 3) only one randomized control study examined the effects of healthy work environment on patient outcomes.

Based on cursory reviews of studies that were excluded during this integrative literature review, there seems to be a trend in studies examining staffing, nurse burnout and patient satisfaction. It may be an assumption that achieving Magnet status and implementing HWE standards result in better staffing, higher nurse satisfaction and better retention rates as well as improved patient outcomes. However there are few studies supporting this relationship.

Achieving Magnet status is a long and expensive process for an organization complete (ANCC, n. d.). It may be assumed that improved patient outcomes will result from more satisfied nurses. However there are many components involved in patient care. If nursing administrators had information suggesting that better patient outcomes result from healthier work environments, their decision to invest time and money into such programs could be even more justified.

Conclusions

The purpose of conducting this integrative literature review was to determine if nursing settings that are considered healthy work environments were related to the rate of nursing-sensitive patient outcomes. While the results are varied from no statistical significance to improved patient outcomes, there was an obvious lack of increased negative patient outcomes in healthy work environments. This could suggest a relationship between healthy work environments and improved nursing-sensitive patient outcomes.

There are many components involved in patient care and, many of them do not involve the nurse. In three-fourths (n= 9; 75%) of the studies included in this integrative literature review improvements in nursing-sensitive patient outcomes in healthier work environments were supported. This is indicative of the significant role healthy work environments play in an organization, on a unit and with the patients.

In summary, the research demonstrated the effectiveness of implementing healthy work environment measures, and suggested a relationship between healthy work environments and improved patient outcomes. The following chapter includes the discussion and summary, including strengths and limitations of the findings, and implications for nursing, clinical practice, administration, education and research.

CHAPTER 5

DISCUSSION AND SUMMARY

DiscussionIntroduction

This chapter discusses the results of the research question, explaining inconsistent findings and summarizing supportive findings. The discussions on healthy work environment and the effect on nursing-sensitive outcomes were based on Donabedian and Florence Nightingale's theoretical framework. The chapter also includes strengths and limitations of the integrative literature review and discussions on implications to research, nursing practice, leadership and education.

Summary

Eleven of the twelve studies were conducted in the United States; one study was conducted in one Australia (see Table 5). All of the studies were of high quality; the lowest quality score was 19/22 (see Table 4). The studies employed several research designs including one randomized control trial, four-mixed method, and several observational and analysis designs (see Table 6). The study populations were all from acute care hospitals although some compared data at a hospital level and others at the unit level. The sample size was difficult to compare as they ranged from 116 patients to 232,342 patients. It was noted that one study without significant results had the lowest sample size and was the only randomized control study (Wolfe et al., 2008).

The studies all used consistent hospital reported data to compare nursing-sensitive patient outcomes. Outcomes included patient falls, medication errors, hospital-acquired infections (VAP, CLABSI, CAUTI), pressure ulcers, post-operative complications such as sepsis, DVT and PE, 30-day mortality rate, and failure to rescue. Various measures of healthy work environment were used including Magnet designation, organizational climate/culture or characteristics, nursing staffing including skill mix, education level, certification and nurse to patient ratio, care environment assessed by a nursing survey PES-NWI, effective communication and collaboration, nurse autonomy, leadership, and teamwork.

Theoretical Framework

This study assessed the relationship between healthy work environments and nursing-sensitive patient outcomes. Donabedian's theoretical framework, Structure, Process, and Outcome (S-P-O) was applied to explain these relationships. Florence Nightingale's theoretical foundation was used as a guiding principle.

For this study, the Structure (S) includes the components of a healthy work environment. The Process (P) includes the activity items for the components of the healthy work environment. The Outcomes (O) measurement includes the nursing-sensitive patient outcome measures. The findings supported that the Structure-Process-Outcome framework was useful and an effective framework. It allowed for a relationship between the healthy work environment and nursing-sensitive patient outcomes to be identified.

The results showed a possible relationship between healthy work environment and patient sensitive outcomes. The SPO framework is useful in directing this research, which attempts to analyze the relationships between the structure, the process and their effects on the outcomes. Although the framework was written to evaluate medical care and has been used to assess and improve medical quality, it has also been widely used in the consideration of quality of nursing care and nursing outcomes (Reilly, Mueller & Zimmerman, 2006).

Florence Nightingale was the first nurse documented in history to make a change to the environment to improve patient outcomes (Mitchell & Shortell, 2007). Mitchell and Shortell (1997), reported that

changes in mortality accomplished through organizational processes were reported as long ago as 1955. Florence Nightingale showed significant reduction in mortality among wounded soldiers at Scutari by organizing their care around principles of hygiene and the use of trained nurses (p.NS22).

She was also a pioneer in the education of nurses (Mitchell & Shortell, 1997). This integrative literature support Florence Nightingale's original beliefs about the environment.

Inconsistent Findings

An integrative literature review was completed evaluating twelve research studies that met the inclusion criteria. Three studies (n=3; 25%) (Wolfe et al., 2008, Solomita, 2009, & Shortell et al., 1994) reported no statistically significant results. A detailed summary of these studies can be found in Appendix D.

Wolfe et al., (2008) compared a presumably healthy work environment to patient centered care strategies implemented on a similar unit within the same hospital, and concluded that the difference between the two units' work environments may not have been significant enough to yield results.

Solomita (2009) reported no statistically significant results yet noticed a significant reduction in post-surgical deaths in Magnet hospitals. Solomita also identified an increased rate of two nursing sensitive outcomes in Magnet hospitals. She questioned the reliability of these findings and concluded that the increase in the two outcome measures could not be attributed to nursing care. Rather these findings could be the result of medical care, devices used or patient factors (Solomita, 2009). Solomita controlled for registered nurse staffing in order to examine Magnet status as a completely separate factor. If she would not have controlled for RN staffing, the results may have been more consistent with the findings of this integrative literature review.

Shortell et al., (1994) noted that there was a significant relationship between technology and lower risk-adjusted mortality. The authors concluded, "The findings suggest that ICUs that have a team-oriented culture with supportive nursing leadership, timely communication, effective coordination, and with collaborative open problem solving approaches are significantly more efficient in terms of moving patients in and out of the unit. The positive relationship between caregiver interaction and evaluated technical quality of care suggests that physicians and nurses believe that technical quality is higher when a team-oriented culture and supportive leadership exists along with effective communication, coordination, and problem-solving approaches. This is true even though there was no significant association with risk-adjusted mortality (p. 521).

Supportive Findings

The majority (n= 9; 75%) of the articles that met inclusion criteria suggested that a healthy work environment effected nursing sensitive patient outcomes by showing a decrease in the number of negative outcomes. The studies that support the findings are summarized in Appendix C.

Strengths

There were several strengths associated with the studies included in this integrative literature review. The consistency of researchers among the various articles was phenomenal; there was an overlap of researchers in over half of the studies. The large sample size used in many studies strengthens the data reported. The use of AHA, NDNQI, CDC NNIS and Medicare data gives merit to the consistency of the results. The quality of research was high, resulting in more accurate results.

The comprehensiveness of the studies included in this integrative literature review was notable; the databases used included information about patient outcomes as reported to multiple agencies, patient risk factors, hospital and unit demographics, organizational factors, and nurse working conditions.

Limitations

Research Articles. There were significant limitations associated with the research studies reviewed. As mentioned previously the studies relied on data reported by nurses and other health care staff on the rate of patient incidents. This number can be unreliable based on individual and organizational characteristics. The fact that as of

October 2008 hospitals are no longer reimbursed by Medicare for certain preventable or hospital acquired conditions has had an affect on the number diagnosed and reported. This has changed the role of nursing staff and placed an emphasis on preventing occurrences of such events, changing the relationship between nursing care, the environment and preventable nursing-sensitive patient outcomes.

As discussed previously it is difficult to compare hospital data identifying certain units or hospitals and healthy and others as unhealthy. It was recognized in several of the studies that hospitals that are participating in data collection for benchmarking purposes are potentially involved in quality improvement measures. In studies that compared Magnet to non-Magnet hospitals, it was noted that some of the non-Magnet hospitals were “Magnet applicants” in various stages of implementing Magnet standards.

It is challenging to control for all the differences present in health care environments and many of them aside from nursing care impact patient outcomes. While nursing-sensitive patient outcomes have been identified, it is problematic to control for all the variables including patient health, age, diagnosis and culture, medical care, hospital characteristics, and medical treatment, technology, devices and equipment available. Many of the studies relied on convenience data, which limits generalizability.

Researchers have been noticing a gap in the literature relating the work environment to patient outcomes as early as 1994. Some have identified the need for research at the unit level rather than at the hospital level (Boyle, 2006; Dunton et al., 2007). These researchers claim that hospital-level outcome data mask unit-level patterns, and that the nursing unit is the center of patient care (Boyle, 2006; Dunton et al., 2007). Boyle (2004) wrote, “since little is known about the relationship between unit

organizational characteristics and patient outcomes, efforts to construct optimal work environments continue to be hampered by lack of empirical evidence” (p.1). This observation was prevalent through the review of literature in articles published as early as 1994 to articles published in 2011. This gap may be attributed to the difficulty researchers confront in acquiring unit-level data from large hospitals (Needleman, Buerhaus, Mattke, Stewart & Zelevinsky, 2001; Dunton et al., 2007).

The most challenging aspect of this project was trying to compare studies examining healthy work environment factors and different patient outcomes. There appeared to be a connection between the healthy work environment factors identified and the nursing-sensitive patient outcomes. However it is difficult to compare the results due to the inconsistency of measures used by researchers. Each research study found in this integrative literature review compared different work environment factors and different patient outcomes. There is little consistency in the research, which makes it difficult to draw conclusions.

Research Methodology. Limitations of this integrative literature review include the availability of published research comparing healthy work environments to non-healthy work environments using nursing-sensitive patient outcomes. The search for relevant research was completed in 2011, it was noted that at least one notable study was nearing completion and would not be included in the results.

There is not a standard way of defining and measuring a healthy work environment. To be inclusive of as many possible healthy work environments that have been studied, a literature review was completed to define healthy work environment for

purposes of this integrative literature review (chapter 1). The broad definition and multiple factors used complicated this research. It would have been simpler to use Magnet hospital designation and compare the patient outcomes to non-Magnet hospitals. However according to the literature review completed on healthy work environments, Magnet hospitals are not the only ones that have healthy work environments and a unit is not considered healthy if it has only one healthy work environment factor.

A literature review was also completed to find out what nursing-sensitive patient outcomes are and how they are measured and reported (chapter 1). Again it would have been easier to compare one patient outcome consistently, however to widen the search they were all used in this integrative literature review. While it is difficult to compare the information found, it is indicative that a standard is required for research on this subject in order for the results to have a meaning and make an impact in the profession of nursing.

There is an obvious gap in literature from 1999 through 2004; an additional search of the literature was completed to identify the reason for the gap. It was found that an abundance of studies focused on nurse staffing and patient outcomes and surveys of nurses' perception of the work environment and patient outcomes were completed during this time period. Many studies found attempted to link poor work environments to poor patient outcomes rather than healthy work environment to positive patient outcomes. These studies did not meet the inclusion criteria for the current literature review. It is important to note that nursing-sensitive patient outcomes and healthy work environment standards had their beginnings during this time period. This actually added to the

complexity of the subject by identifying multiple components of a healthy work environment and many nursing-sensitive patient outcomes.

Implications and Recommendations

Nursing Practice. This integrative literature review attempted to make a connection between healthy work environments and nursing-sensitive patient outcomes. While it is difficult to make a concrete connection due to the variables used in the research, there is a pattern of improved outcomes in organizations that are dedicated to quality improvement. There are many implications for practice including, providing evidence to nursing leaders to improve patient safety by implementing healthy work environment standards, and defining what those standards are. Better patient safety with fewer adverse events can yield cost savings and prevent patients' pain and suffering. Developing and sustaining leadership as well as staff is a focus that is supported by this research. Nurses are in a position that qualifies them to take a leading role in creating a healthy work environment and can have great impact on improving patient safety.

Patient outcome information is gathered from hospital data such as incident reports. Nurses have a responsibility to complete incident reports so researchers have the data to use. In my experience, the increasing amount of documentation required by nurses, limited staffing, higher patient–nurse ratios, higher acuity of patients, and the fear of criticism of peers are barriers to accurate reporting by nurses. Nurses also have a responsibility to become more proficient in their technology skills. Computerized incident reports can be a barrier for some nurses in reporting data. As nurses become more proficient in technology patient care has the potential to be more efficient and

nurses will potentially have more time to attend to details like reporting patient outcomes accurately.

Nursing Education and Administration. Changing the culture of the work environment requires a vision and a systematic long-term plan that is well communicated throughout the hospitals. More importantly, this vision needs to be mutually shared among all the health care professions. Educational programs regarding the behaviors/activities in the work environment can raise awareness and provide the opportunity of discussions about improvement. Improvement cannot be made without the involvement, assessment, evaluation and the support of the entire nursing team. Magnet hospitals and healthy work environments are better places for everyone to work and be cared for. Nurses are not the only ones who benefit by having a healthy work environment, however they have the power to change it.

Nurse educators should let nurses know that the information they provide about their work environment and patient outcomes is invaluable to researchers. Nurses should be educated that reporting an increased amount of errors during a specific time period can tell the administration that there may have been something in the work environment contributing to the errors. They can look at trends in reported patient outcomes and compare to organizational changes on the unit. They may see improved patient outcomes or a decrease in negative patient outcomes when positive changes have been made in the work environment. They may also see an increase of negative patient outcomes during a time of stress or poor staffing on a unit. When nurses know that the information they provide will be used to improve their work environment and may lead to better patient

outcomes, rather than get them or a peer in trouble, they may be more willing to complete incident reports.

Research. This research points out the lack of evidence supporting Magnet status and healthy work environment standards being used to improve patient outcomes in the process of creating a better work environment. Continued research is needed to make a connection between patient outcomes and healthy work environment. Many hospitals are attempting to gain Magnet status; the changes they make are an opportunity for looking at how patient outcomes are affected. Researchers could look at patient outcome data of a hospital before the Magnet standards were implemented and see if there is improvement when they achieve and sustain Magnet designation.

Researchers need to define a consistent measure of a healthy work environment and use it in their research so the results can be compared and used to make changes. There also needs to be some consistency in the nursing-sensitive patient outcomes measure to ensure results from multiple studies can be compared. Researchers should examine multiple patient outcomes so that there is a better chance another researcher examined at least one of the same outcomes and the studies can be analyzed for similarities and conclusions can accurately be drawn.

Researchers should use a consistent unit of measurement; a hospital unit is the most applicable in comparing healthy work environments as the environment changes throughout the hospital. Each individual unit has its own culture, personality and values which may affect patient outcomes.

Further research needs to be done to examine which nursing sensitive outcome is affected most by healthy work environment factors. One way to determine this is to look at the research done on poor patient outcomes, nurse burnout and other unhealthy work environment factors and determine the adverse patient outcomes that are prevalent. In my experience when units are short staffed, stressed, or there is nurse burnout, there are more medication errors, patient falls and chemical or physical restraint use.

As more hospitals are seeking quality improvement, and are focused on minimizing adverse effects and improving patient satisfaction scores, a perfect opportunity for researching the before and after is created. With the implementation of the Electronic Medical Record nationwide it will potentially be easier to track patient outcomes.

An instrument such as PES-NWI should be tested at the unit level as a measurement of organizational characteristics and nurses' perception of the work environment. The use of factor scores would provide a method for reporting scores. Additional factor analysis should be conducted to identify and compare factor findings. Further analysis could include interventions aimed at improving unit work environment characteristics with pre and post measures of PES-NWI and nursing sensitive outcomes. Research may help explain how organizational change affects nursing work environment at the unit level and the impact on patient outcomes.

In summary, expanding our knowledge of the relationship between nursing workforce factors and patient outcomes will come from the use of data sets which support hierarchical analyses; additional attributes of the nursing workforce; unit-level data; and large, representative, longitudinal data sets

Summary

There is a lack of literature documenting the effect of a healthy work environment on nursing-sensitive patient outcomes. When discussing this literature review with peers and colleagues, there was an overwhelming feeling that it is not important research because it is obvious that a healthy work environment would result in better patient outcomes. This widespread view could contribute to the fact that researchers have focused their attention in other areas such as staffing, education and the negative outcomes when certain unhealthy elements exist. The more studies are done about this relationship, the more effective it can be in promoting a healthy work environment and establishing a culture of safety within an organization. Therefore, it is important to understand how these attributes interact and to develop a safe environment for patients.

Patient outcomes and patient satisfaction are becoming more of a focus in hospitals around the world. Demands from health care providers, patients, and administrators to improve the work environment and patient safety are growing, especially since the number of health care related errors has been highlighted in the media. This research is important to nurses, patients and organizations to justify making changes to the environment of care. There are many factors involved in patient outcomes, with a healthy work environment being only one of them. However a change to a healthy work environment could help in so many ways, for health care workers organizations and patients.

The fundamental change that needs to take place in health care is one that relates to hospital patient outcomes and work environment. There are basic and essential healthy

work environment elements that could to be in place across all hospitals. Often these essential elements have a significant impact on creating a healthy work environment. This research has provided some evidence that healthy work environment factors (structure and process) contribute to improved patient outcomes. Therefore, in order to achieve improved patient outcomes, it is necessary to have both structure and process in place. It must be examined in hospitals, communicated through the organizations and welcomed by all health care professionals, especially nurses who are in a great position to assure healthy work environments and improved patient outcomes.

This integrative literature review was unique because it examined research related to healthy work environments including Magnet hospitals and those that have demonstrated certain healthy work environment characteristics. In contrast, most studies examined either Magnet designation or components of healthy work environment such as staffing, leadership or communication. The findings of this research suggests the need for better identification of healthy work environment and use of consistent nursing-sensitive patient outcomes by researchers, and suggests the importance of a healthy work environment for all aspects of patient care.

Findings strengthened the principle that the work environment at the unit level mediates the effects of nursing interventions. The challenge is to define and measure unit characteristics that support and transform nursing processes into patient outcomes within the context of the nursing unit.

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APPENDICES

APPENDIX A

CHECKLIST FOR ASSESSING QUALITY

Criteria

- 1 Question / objective sufficiently described?
- 2 Study design evident and appropriate?
- 3 Method of subject/comparison group selection or source of information/input variables described and appropriate?
- 4 Subject (and comparison group, if applicable) characteristics sufficiently described?
- 5 If interventional and random allocation was possible, was it described?
- 6 If interventional and blinding of investigators was possible, was it reported?
- 7 If interventional and blinding of subjects was possible, was it reported?
- 8 Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? means of assessment reported?
- 9 Sample size appropriate?
- 10 Analytic methods described/justified and appropriate?
- 11 Some estimate of variance is reported for the main results?
- 12 Controlled for confounding?
- 13 Results reported in sufficient detail?
- 14 Conclusions supported by the results?

Scoring

YES (2 points)

PARTIAL (1 point)

NO (0 points)

Manual for Quality Scoring of Quantitative Studies Definitions and Instructions for Quality Assessment Scoring

How to calculate the summary score Total sum = (number of “yes” * 2) + (number of “partials” * 1)

Total possible sum = 28 – (number of “N/A” * 2) Summary score: total sum / total possible sum

Quality assessment

1. Question or objective sufficiently described?

Yes: Is easily identified in the introductory section (or first paragraph of methods section). Specifies (where applicable, depending on study design) all of the following: purpose, subjects/target population, and the specific intervention(s) /association(s)/descriptive parameter(s) under investigation. A study purpose that only becomes apparent after studying other parts of the paper is not considered sufficiently described.

Partial: Vaguely/incompletely reported (e.g. “describe the effect of ” or “examine the role of ” or “assess opinion on many issues” or “explore the general

attitudes”...); or some information has to be gathered from parts of the paper other than the introduction/background/objective section.

No: Question or objective is not reported, or is incomprehensible. N/A: Should not be checked for this question.

2. Design evident and appropriate to answer study question?
(If the study question is not given, infer from the conclusions).

Yes: Design is easily identified and is appropriate to address the study question / objective.

Partial: Design and /or study question not clearly identified, but gross inappropriateness is not evident; or design is easily identified but only partially addresses the study question.

No: Design used does not answer study question (e.g., a comparison group is required to answer the study question, but none was used); or design cannot be identified.

N/A: Should not be checked for this question.

3. Method of subject selection (and comparison group selection, if applicable) or source of information/input variables (e.g., for decision analysis) is described and appropriate.

Yes: Described and appropriate. Selection strategy designed (i.e., consider sampling frame and strategy) to obtain an unbiased sample of the relevant target population or the entire target population of interest (e.g., consecutive patients for clinical trials, population-based random sample for case-control studies or surveys). Where applicable, inclusion/exclusion criteria are described and defined (e.g., “cancer” -- ICD code or equivalent should be provided). Studies of volunteers: methods and setting of recruitment reported. Surveys: sampling frame/strategy clearly described and appropriate.

Partial: Selection methods (and inclusion/exclusion criteria, where applicable) are not completely described, but no obvious inappropriateness. Or selection strategy is not ideal (i.e., likely introduced bias) but did not likely seriously distort the results (e.g., telephone survey sampled from listed phone numbers only; hospital based case-control study identified all cases admitted during the study period, but recruited controls admitted during the day/evening only). Any study describing participants only as “volunteers” or “healthy volunteers”. Surveys: target population mentioned but sampling strategy unclear.

No: No information provided. Or obviously inappropriate selection procedures (e.g., inappropriate comparison group if intervention in women is compared to

intervention in men). Or presence of selection bias which likely seriously distorted the results (e.g., obvious selection on “exposure” in a case-control study).

N/A: Descriptive case series/reports.

4. Subject (and comparison group, if applicable) characteristics or input variables/information (e.g., for decision analyses) sufficiently described?

Yes: Sufficient relevant baseline/demographic information clearly characterizing the participants is provided (or reference to previously published baseline data is provided). Where applicable, reproducible criteria used to describe/categorize the participants are clearly defined (e.g., ever-smokers, depression scores, systolic blood pressure > 140). If “healthy volunteers” are used, age and sex must be reported (at minimum). Decision analyses: baseline estimates for input variables are clearly specified.

Partial: Poorly defined criteria (e.g. “hypertension”, “healthy volunteers”, “smoking”). Or incomplete relevant baseline / demographic information (e.g., information on likely confounders not reported). Decision analyses: incomplete reporting of baseline estimates for input variables.

No: No baseline / demographic information provided. Decision analyses: baseline estimates of input variables not given.

N/A: Should not be checked for this question.

5. If random allocation to treatment group was possible, is it described?

Yes: True randomization done - requires a description of the method used (e.g., use of random numbers).

Partial: Randomization mentioned, but method is not (i.e. it may have been possible that randomization was not true).

No: Random allocation not mentioned although it would have been feasible and appropriate (and was possibly done).

N/A: Observational analytic studies. Uncontrolled experimental studies. Surveys. Descriptive case series / reports. Decision analyses.

6. If interventional and blinding of investigators to intervention was possible, is it reported?

Yes: Blinding reported.

Partial: Blinding reported but it is not clear who was blinded.

No: Blinding would have been possible (and was possibly done) but is not reported.

N/A: Observational analytic studies. Uncontrolled experimental studies. Surveys. Descriptive case series / reports. Decision analyses.

7. If interventional and blinding of subjects to intervention was possible, is it reported?

Yes: Blinding reported.

Partial: Blinding reported but it is not clear who was blinded.

No: Blinding would have been possible (and was possibly done) but is not reported.

N/A: Observational studies. Uncontrolled experimental studies. Surveys. Descriptive case series / reports.

8. Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?

Yes: Defined (or reference to complete definitions is provided) and measured according to reproducible, “objective” criteria (e.g., death, test completion – yes/no, clinical scores). Little or minimal potential for measurement / misclassification errors. Surveys: clear description (or reference to clear description) of questionnaire/interview content and response options. Decision analyses: sources of uncertainty are defined for all input variables.

Partial: Definition of measures leaves room for subjectivity, or not sure (i.e., not reported in detail, but probably acceptable). Or precise definition(s) are missing, but no evidence or problems in the paper that would lead one to assume major problems. Or instrument/mode of assessment(s) not reported. Or misclassification errors may have occurred, but they did not likely seriously distort the results (e.g., slight difficulty with recall of long-ago events; exposure is measured only at baseline in a long cohort study). Surveys: description of questionnaire/interview content incomplete; response options unclear. Decision analyses: sources of uncertainty are defined only for some input variables.

No: Measures not defined, or are inconsistent throughout the paper. Or measures employ only ill-defined, subjective assessments, e.g. “anxiety” or “pain.” Or obvious misclassification errors/measurement bias likely seriously distorted the results (e.g., a prospective cohort relies on self-reported outcomes among the

“unexposed” but requires clinical assessment of the “exposed”). Surveys: no description of questionnaire/interview content or response options. Decision analyses: sources of uncertainty are not defined for input variables.

N/A: Descriptive case series / reports.

9. Sample size appropriate?

Yes: Seems reasonable with respect to the outcome under study and the study design. When statistically significant results are achieved for major outcomes, appropriate sample size can usually be assumed, unless large standard errors (SE > 1/2 effect size) and/or problems with multiple testing are evident. Decision analyses: size of modeled cohort / number of iterations specified and justified.

Partial: Insufficient data to assess sample size (e.g., sample seems “small” and there is no mention of power/sample size/effect size of interest and/or variance estimates aren’t provided). Or some statistically significant results with standard errors > 1/2 effect size (i.e., imprecise results). Or some statistically significant results in the absence of variance estimates. Decision analyses: incomplete description or justification of size of modeled cohort / number of iterations.

No: Obviously inadequate (e.g., statistically non-significant results and standard errors > 1/2 effect size; or standard deviations > _ of effect size; or statistically non-significant results with no variance estimates and obviously inadequate sample size). Decision analyses: size of modeled cohort / number of iterations not specified.

N/A: Most surveys (except surveys comparing responses between groups or change over time). Descriptive case series / reports.

10. Analysis described and appropriate?

Yes: Analytic methods are described (e.g. “chi square”/ “t-tests”/“Kaplan-Meier with log rank tests”, etc.) and appropriate.

Partial: Analytic methods are not reported and have to be guessed at, but are probably appropriate. Or minor flaws or some tests appropriate, some not (e.g., parametric tests used, but unsure whether appropriate; control group exists but is not used for statistical analysis). Or multiple testing problems not addressed.

No: Analysis methods not described and cannot be determined. Or obviously inappropriate analysis methods (e.g., chi-square tests for continuous data, SE given where normality is highly unlikely, etc.). Or a study with a descriptive goal / objective is over-analyzed.

N/A: Descriptive case series / reports.

11. Some estimate of variance (e.g., confidence intervals, standard errors) is reported for the main results/outcomes (i.e., those directly addressing the study question/ objective upon which the conclusions are based)?

Yes: Appropriate variances estimate(s) is/are provided (e.g., range, distribution, confidence intervals, etc.). Decision analyses: sensitivity analysis includes all variables in the model.

Partial: Undefined “+/-“ expressions. Or no specific data given, but insufficient power acknowledged as a problem. Or variance estimates not provided for all main results/outcomes. Or inappropriate variance estimates (e.g., a study examining change over time provides a variance around the parameter of interest at “time 1” or “time 2”, but does not provide an estimate of the variance around the difference). Decision analyses: sensitivity analysis is limited, including only some variables in the model.

No: No information regarding uncertainty of the estimates. Decision analyses: No sensitivity analysis.

N/A: Descriptive case series / reports. Descriptive surveys collecting information using open-ended questions.

12. Controlled for confounding?

Yes: Randomized study, with comparability of baseline characteristics reported (or non-comparability controlled for in the analysis). Or appropriate control at the design or analysis stage (e.g., matching, subgroup analysis, multivariate models, etc). Decision analyses: dependencies between variables fully accounted for (e.g., joint variables are considered).

Partial: Incomplete control of confounding. Or control of confounding reportedly done but not completely described. Or randomized study without report of comparability of baseline characteristics. Or confounding not considered, but not likely to have seriously distorted the results. Decision analyses: incomplete consideration of dependencies between variables.

No: Confounding not considered, and may have seriously distorted the results. Decision analyses: dependencies between variables not considered.

N/A: Cross-sectional surveys of a single group (i.e., surveys examining change over time or surveys comparing different groups should address the potential for confounding). Descriptive studies. Studies explicitly stating the analysis is strictly descriptive/exploratory in nature.

13. Results reported in sufficient detail?

Yes: Results include major outcomes and all mentioned secondary outcomes.

Partial: Quantitative results reported only for some outcomes. Or difficult to assess as study question/objective not fully described (and is not made clear in the methods section), but results seem appropriate.

No: Quantitative results are reported for a subsample only, or “n” changes continually across the denominator (e.g., reported proportions do not account for the entire study sample, but are reported only for those with complete data-- i.e., the category of “unknown” is not used where needed). Or results for some major or mentioned secondary outcomes are only qualitatively reported when quantitative reporting would have been possible (e.g., results include vague comments such as “more likely” without quantitative report of actual numbers).

N/A: Should not be checked for this question.

14. Do the results support the conclusions?

Yes: All the conclusions are supported by the data (even if analysis was inappropriate). Conclusions are based on all results relevant to the study question, negative as well as positive ones (e.g., they aren't based on the sole significant finding while ignoring the negative results). Part of the conclusions may expand beyond the results, if made in addition to rather than instead of those strictly supported by data, and if including indicators of their interpretative nature (e.g., “suggesting,” “possibly”).

Partial: Some of the major conclusions are supported by the data, some are not. Or speculative interpretations are not indicated as such. Or low (or unreported) response rates call into question the validity of generalizing the results to the target population of interest (i.e., the population defined by the sampling frame/strategy).

No: None or a very small minority of the major conclusions are supported by the data. Or negative findings clearly due to low power are reported as definitive evidence against the alternate hypothesis. Or conclusions are missing. Or extremely low response rates invalidate generalizing the results to the target population of interest (i.e., the population defined by the sampling frame/strategy).

N/A: Should not be checked for this question.

APPENDIX B

DATA REDUCTION OF INCLUDED STUDIES

Author Year	Design	Purpose	Sample	HWE	NSO	Major Finding	Qual. Score
Capuano, et al. (2005)	Mixed method	Evaluate impact of HWE to NSO	70 patient care units at magnet hospitals	leadership resources staff-expertise staff-stability teamwork	HA pneumonia UTI, Mortality Med Errors, Pt. Falls	Improved outcomes with HWE	20/22
Stone et al. (2007)	Obs. study with data collection	Examine the effects of working conditions on NSPO	51 ICUs in 31 hospitals elderly patients	Organizational climate, nurse staffing	CLBSI, VAP, CAUTI, mortality and pressure ulcers	Increased staff results in decrease CAUTI, VAP, mortality and pressure ulcers Increase in CLBSI	19/22
Frieze et al. (2007)	Secondary analysis	Examine effects of nursing practice environments on cancer patient outcomes	25,957 cancer patients, 164 nursing units	Nurse staffing ratio, nurse education, practice environment measured using Nursing Work Index	Mortality, complications & failure to rescue	Nurse staffing and education resulted in improved PO	20/22
Aiken et al. (2008)	Mixed method	Analyze the effects of nurse practice environments on nurse and patient outcomes	10184 nurses 232,342 surgical patients at 168 hospitals	Care environment. measured using Nursing Work Index	Mortality & Failure to rescue	Better care environment resulted in decreased death and FTR	19/22
Wolfe et al. (2008)	RCT	Determine if patient centered care affects quality	116 patients 2 nursing units	Patient centered care, communication skills	Falls, infections, postop comp.	No statistically significant results	22/22
Aiken, Smith & Lake (1994)	Observational matched comparison study	Examine the difference in mortality rates between Magnet and non-Magnet hospitals	39 Magnet hospitals compared to 195 non-Magnet	Magnet hospitals	Mortality	4.6% lower mortality rate	22/22

Author Year	Design	Purpose	Sample	HWE	NSO	Major Finding	Qual. Score
Kooker & Kamikawa (2009)	Mixed method	Examine the effects of magnet standards on Pt. outcomes	4 nursing units	ANCC Magnet standards	HA pressure ulcers	Increased quality of care = fewer pressure ulcers	22/22
Chaboyer et al. (2010)	Observation time-series study	Examine effects of transforming care at bedside on NSPO	2 medical units	Transforming care improvement strategies	Med errors, falls, pressure ulcers	Transforming care at bedside resulted in improved PO	20/22
Lake, Shang, Klaus & Dutton (2010)	Retro Cross-sectional study	Examine the relationship between magnet status, staffing and pt. falls	5,388 nursing units in 636 hospitals	AANC Magnet status, nursing staffing and education level	Pt. falls	Magnet hospitals have 5% fewer falls	19/22
Aiken, et al. (1999)	Observational matched comparison study	Compare differences in AIDS mortality in dedicated units and magnet hospitals	40 Units in 20 Magnet hospitals 1205 AIDS patients	Magnet status, nurse to pt ratios, specialty education, nurse autonomy	Mortality	Magnet hospital had up 60% lower mortality for AIDS patients	19/22
Shortell, et al. (1994)	Mixed method	Examine factors associated with mortality	17,440 patients in 42 ICUs.	Leadership, coordination, communication, conflict management & caregiver interaction	Mortality	No association with mortality Lower LOS and relationship with technology, HWE and mortality	20/22
Solomita (2009)	Dissertation Exploratory cross-sectional study	Determine relationship between magnet status and NSPO	1003 hospitals	Magnet status, nurse staffing & organizational characteristics	Pressure ulcers, surgical death, postop resp. fail, postop DVT/PE, postop sepsis	No association between Magnet status and improve NSPO Lower death rate of surgical patients	19/22

APPENDIX C

SUMMARY SUPPORTIVE STUDIES

In 1994, researchers studied Magnet and non-Magnet hospitals in relation to patient outcomes (Aiken, Smith & Lake, 1994) and found that Magnet hospitals, after adjusting for severity of illness, had a 4.6% lower Medicare mortality rate. They examined Medicare mortality rates using 1988 data for 39 of the 41 original Magnet hospitals (one hospital had closed and one was a Veterans Administration hospital not included in the Medicare data) by using a multivariate matched sampling procedure that controlled for hospital characteristics that previous research had shown to be associated with mortality (ownership, teaching status, size, location, financial status, physician qualifications, technology index, and emergency admissions). The 39 Magnet hospitals were matched with 195 comparison hospitals (five per Magnet hospital) selected from all non-Magnet U.S. hospitals with more than 100 Medicare discharges. Medicare mortality rates in Magnet and comparison hospitals were compared using variance components models, which pool information from each group of five matched hospitals and adjust for differences in patient composition, as measured by predicted mortality. After adjustment for differences in predicted mortality for Medicare patients, the Magnet hospitals had a 4.6% lower mortality rate ($p = 0.026$), which translates to between 0.9 to 9.4 fewer deaths per 1,000 discharges (with 95% confidence).

The Nursing Work Index-Revised (NWI-R) was used to measure organizational characteristics for comparison of Magnet and non-Magnet hospitals. Nurse autonomy, control of practice, and collaboration with physicians were identified as Magnet characteristics that affect patient outcomes; nurse staffing and percentage of RN's was not a predictor in regression models.

The next study of the Magnet hospitals (Aiken, Sloane, Lake, Sochalski & Weber, 1999), involved data from 1,205 consecutively admitted patients with AIDS and from 820 nurses on 40 units in a subset of 20 Magnet hospitals. Patient outcomes were compared for patients with AIDS in Magnet hospitals without dedicated AIDS units and in comparison hospitals with and without dedicated AIDS units. Patients with AIDS in scattered-bed units in Magnet hospitals had lower odds of dying than did AIDS patients in any other setting-lower by 60%, for example, than patients in scattered-bed units in non-Magnet hospitals.

There is an obvious gap in literature from 1999 through 2004; an additional search of the literature was completed to identify the reason for the gap. It was found that an abundance of studies focused on nurse staffing and patient outcomes and surveys of nurses' perception of the work environment and patient outcomes were completed during this time period. Many studies found attempted to link poor work environments to poor patient outcomes rather than healthy work environment to positive patient outcomes. These studies did not meet the inclusion criteria for the current literature review. It is important to note that nursing-sensitive patient outcomes and healthy work environment standards had their beginnings during this time period. These two measures added to the validity and measurability of future studies.

In 2005, Capuano, Bokovoy, Hitchings & Houser published "Use of a validated model to evaluate the impact of the work environment on outcomes at a Magnet hospital." They used a model to evaluate the work environment on 34 units at one Magnet hospital for work environment factors including: leadership, teamwork, staff competence, resources and stability and linked these to nursing-sensitive patient

outcomes including: Hospital acquired pneumonia, hospital acquired UTI, mortality, medication errors, and patient falls. They found a statistical significance between all work environment factors and nurse-sensitive patient outcomes, concluding that a healthier work environment leads to positive patient outcomes.

Stone, Mooney-Kane, Larson, Glance, Zwanziger & Dick (2007) wrote “Nurse working conditions and patient safety outcomes”, studying the effect of improving working conditions of nurses on patient safety outcomes in intensive care units. Working condition variables were measured by a survey of nurses and included organizational climate, measures of staffing, overtime and wages, hospital profitability and Magnet accreditation. The outcome measures included: Central line associated bloodstream infections (CLBSI), ventilator-associated pneumonia (VAP), catheter associated urinary tract infections (CAUTI), 30-day mortality and decubiti. Using Donabedian’s conceptual framework they developed a conceptual model.

The NNIS’s system of infection surveillance was used to identify patients with CLBSI, VAP and CAUTI, the thirty-day mortality and decubiti were identified using Medicare files. An RN survey provided work environment measures, as well as identification of Magnet status. The study sample comprised 15,902 patients from 51 ICUs at 31 hospitals. 1095 RN surveys on work environment were analyzed. Findings significant to this literature review include: Patient’s admitted to ICUs in which nurses’ perceived a more positive organizational climate had slightly higher odds of developing CLBSI, but were 39% less likely to develop a CAUTI; patients admitted to an ICU with more RN hours per patient day had significantly lower incidence of CLBSI, VAP, 30-day mortality and decubiti. The number of Magnet hospitals included was too small to be

conclusive. In conclusion, the relationship between nurses' perceived organizational climate and outcomes were not consistent. There was question as to whether the outcomes accurately measured nursing care in the ICU or if medical care was also a factor. Overall this study supports the systems approach and that improving nurse working conditions can improve patient safety.

Aiken et al. (2008), analyzed the net effects of nurse practice environments on nurse and patient outcomes after accounting for nurse staffing and education. The authors report, staffing and education have well documented associations with patient outcomes, but evidence on the effect of care environments on outcomes has been more limited (Aiken et al. 2008). Data from 10,184 nurses and 232,342 surgical patients in 168 Pennsylvania hospitals were analyzed. Care environments were measured using the practice environment scales of the Nursing Work Index. Outcomes included nurse job satisfaction, burnout, intent to leave, and reports of quality of care, as well as mortality and failure to rescue in patients. Nurses reported more positive job experiences and fewer concerns with care quality, and patients had significantly lower risks of death and failure to rescue in hospitals with better care environments. They concluded that care environment elements must be optimized alongside nurse staffing and education to achieve high quality of care (Aiken et al, 2008).

“Hospital nurse practice environments and outcomes for surgical oncology patients” by Friese, Lake, Aiken, Silber & Sochalski was published in Health Services Research in August 2008. Using four datasets including discharge database, cancer registry records, the American Hospital Association (AHA) annual survey and the Center for Health Outcomes and Policy Research survey data; they identified patients who had

certain types of cancer for a total of 25,957 patients. They used nurse survey results from a previous study regarding job satisfaction, burnout, staffing and reports of their practice environment. The nursing characteristics measured included: The nurse practice environment, nurse staffing and educational preparation of registered nurses. The outcome measures included: 30-day mortality, complications and failure to rescue.

The results supported the hypotheses that nursing characteristics were significantly related to all three patient outcomes. Hospitals with better staffing had lower 30-day mortality rates; hospitals whose nurses had more advanced educational preparation had lower mortality rates. Better nurse staffing, favorable environments and higher education were associated with lower failure to rescue rates. Complications were improved with better nurse staffing and practice environments, however no significant association with educational preparation. The relationship between nurse practice environments and outcomes persists after adjusting for differences in patients and hospitals.

“Successful strategies to improve RN retention and patient outcomes in a large medical center in Hawaii” by Kooker & Kamikawa was published in the Journal of Clinical Nursing in December 2009. The article discusses a retention initiative implemented at a major medical center in Hawaii with the goal of retaining nurses. A training program was initiated to improve RN retention and patient care outcomes. Four inpatient-nursing units became Magnet Pilot Units to demonstrate progress toward achievement of Magnet standards and improvement of patient outcomes. In addition to improved retention and patient satisfaction, over the course of 4 years the units experienced improved registered nurse satisfaction and autonomy, registered nurse

satisfaction and decision-making, and the nosocomial decubitus ulcer rate decreased significantly (56% reduction).

In December 2009 the Journal of Advanced Nursing published, “Transforming care strategies and nursing-sensitive patient outcomes” by Chaboyer, Johnson, Hardy, Gehrke & Panuwatwanich. It is a report of the effects of implementing 13 Transforming Care at the Bedside improvement strategies on medication errors, patient falls and pressure ulcers. This was an observational, time series study in two medical units in an Australian hospital, the units had 35 and 30 beds each and 26 FTE nursing staff each, nursing hours per patient day were used to measure staffing. Transforming Care at the Bedside (TCAB) is a framework for improving safety on medical/surgical units, developed by The Robert Wood Johnson Foundation and the Institute for Healthcare Improvement. The TCAB framework has four overlapping pillars; safety and reliability, care team vitality, patient-centeredness and increasing value. The results of the study show that the proportion of reported medication errors and patient falls decreased significantly after implementing TCAB; however the proportion of reported pressure ulcers did not (the factor of chance could not be ruled out due to the wide variation from month to month, even though the rate decreased by about half). Factors affecting the results include the fact that the nursing units were having difficulty with staffing, retention and work environment prior to the implementation of TCAB. This truly allowed for a comparison of healthy vs. unhealthy.

In 2010, Lake, Shang, Klaus & Dunton published “Patient falls: Association with hospital Magnet status and nursing unit staffing”. This retrospective cross-sectional study used 2004 National Database of Nursing Quality Indicators (NDNQI) data from

5,388 units in 108 Magnet and 528 non-Magnet hospitals. The purpose of the study was to examine the relationships among nurse staffing, RN composition, Magnet status, and patient falls. The average fall rates were 8.3% lower in Magnet hospitals compared to non-Magnet hospitals. Elements of RN staff composition; proportions of BSNs, specialty-certified nurses and agency nurse hours were not significantly associated with fall rate. RN hours were negatively associated with falls, an additional hour of RN care per patient day reduced the fall rate by 2%. LPN and NA hours had positive relationships with falls; and additional hour of LPN care increased the fall rate by 2.9% and an additional hour of NA care increased the fall rate by 1.5%.

APPENDIX D

SUMMARY OF INCONSISTENT STUDIES

In 1994, Shortell, Zimmerman, Rousseau, Gillies, Wagner, Draper, Knaus & Duffy published “ Performance of intensive care units: Does good management make a difference?” In this study, data collected from 17,440 patients in 42 intensive care units was used to examine the factors associated with risk-adjusted mortality, risk adjusted average length of stay, nurse turnover, evaluated technical quality of care and evaluated ability to meet family member’s needs. Findings significant to this literature review include: Caregiver interaction compromising the culture, leadership, coordination, communication and conflict management abilities of the unit is significantly associated with lower risk-adjusted length of stay, and lower nurse turnover, evaluated technical quality of care and ability to meet family member’s needs; however nurse staffing and caregiver interaction were not associated with risk-adjusted mortality. The study suggests that because there is a significant relationship between technology and lower risk-adjusted mortality, that factors that may be involved with greater availability of technology include: more available and involved leadership, greater resources, teaching activity and active involvement in quality assurance and improvement activities.

The authors conclude, “The findings suggest that ICUs that have a team-oriented culture with supportive nursing leadership, timely communication, effective coordination, and with collaborative open problem solving approaches are significantly more efficient in terms of moving patients in and out of the unit. The positive relationship between caregiver interaction and evaluated technical quality of care suggests that physicians and nurses believe that technical quality is higher when a team-oriented culture and supportive leadership exists along with effective communication, coordination, and

problem-solving approaches. This is true even though there was no significant association with risk-adjusted mortality” (Shortell et al., 1994, p. 521).

In December, 2008 The Journal of Nursing Administration published “Can nurses impact patient outcomes using a patient-centered care model?” by Wolfe, Lehman, Quinlin, Rosenzweig, Friede, Zullo & Hoffman. This was a randomized control study measuring the effect of patient centered care (PCC) including communication skills, negotiating skills and role playing on patient outcomes (infection, falls and length of stay as well as complications up to 7 days post-discharge). They had 116 patients, 58 for the control group and 58 for the PCC group. The control group received the standard of care for post-bariatric surgery care and the PCC group received care from nurses who went to 10 hours of training on PCC and implemented specific interventions recommended by the PCC method.

The results were statistically insignificant. Both groups had similar scores on infection rate, fall rate, complications as well as patient satisfaction. The unit used for this experiment is designated as a bariatric center for excellence and provides continuing education for all nurses; it was not like comparing a healthy work environment to an unhealthy one.

In 2009 Joy Solomita wrote her PhD dissertation “An analysis of variance in nursing-sensitive patient safety indicators related to Magnet status, nurse staffing, and other hospital characteristics”. The purpose of her research was to identify if there was a significant difference in the risk-adjusted rates for a subset of five AHRQ PSIs in relation to Magnet designation in U.S. hospitals. This exploratory, cross-sectional study involved the analysis of organizational characteristics including Magnet status, nurse staffing, bed

size, and other organizational characteristics in relation to 5 of 20 of AHRQ's PSIs. Findings included: preventable adverse event rates were not lower in Magnet hospitals; nurse staffing was better in Magnet hospitals; Magnet status was not associated with preventable PSIs, while controlling for RN staffing and bed size. Findings significant to this literature review include: Magnet hospitals had a significantly higher rate of postoperative deep vein thrombosis (DVT) and pulmonary embolus (PE); Magnet hospitals had significantly lower rate of death among surgical inpatients. This researcher controlled for registered nurse staffing in order to examine Magnet status as a completely separate factor. If she would not have controlled for RN staffing, the results may have been more consistent with the findings of this integrative literature review.