Transformational Teams: Examining the Relationship of Nursing Teamwork to Patient Outcomes

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Dedication

I dedicate this dissertation work to my family. I owe a special note of gratitude to my wonderful husband, Paul Alfred Rahn (Rahnie), whose love, words of encouragement, and acceptance of the time away from him provided the support necessary to see this project through to completion. He is a very special person, and the full description of such would require pages exceeding the dissertation itself.

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I love all of my family including my brother David, and the many extended family members not mentioned by name, both present and those no longer earthly, and I greatly appreciate the many kind words, encouragement, and patience received from them during this process.
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It is my vision that this research process has afforded me with some expertise that will be given back to the nursing profession and the community served by the Reading Health System. It is my goal to use the knowledge gained to contribute forward to the mission of my profession, organization, community, and most importantly to impact the quality and outcomes of patient care. I will be no stranger to the research process moving forward and hope that my efforts will strengthen nursing research in our organization, community and beyond.
Knowledge is the true organ of sight, not the eyes. Panchatantra
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Abstract

Transformational Teams: Examining the Relationship of Nursing Teamwork to Patient Outcomes

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Chairperson: Rajashi Ghosh

Preventable negative patient outcomes continue to pervade multiple sectors of American healthcare. The purpose of this research was to investigate the relationship between nursing teamwork and the nurse-sensitive patient outcomes of pressure ulcers, patient falls, and catheter-associated urinary tract infections. The primary research question of this study was, “How does nursing teamwork affect nurse-sensitive patient outcomes?” Built upon the Donabedian Model of Patient Safety, the mixed methodology design allowed for analysis of correlations between nursing teamwork and the National Database of Nursing Quality Indicators nursing outcome indicators. In addition, central tendency statistics and qualitative analysis of focus group data provided additional data for triangulation. Analysis of the data resulted in statistically significant relationships between nursing teamwork and patient outcomes. In addition, key findings included differing levels of teamwork among teams, the transitory nature of nursing team membership, three descriptive themes related to high-quality teams, the importance of team leadership, barriers to teamwork, the lack of skill in dealing with conflict between team members, and the unmet educational needs of nursing team members. Four primary conclusions provide a framework for teamwork education, interventions, and future research. Four major conclusions relate to the impact of teamwork on nurse-sensitive patient outcomes, the lack of a standard theoretical model of team performance within the nursing profession, the need to adapt team training strategies to address the unique needs of nursing teams, and the need for implementation of additional strategies related to the educational needs of nursing team members.

The concept of transformational teamwork emerged from the evidence and conceptualizes teamwork within a system in which a transformational leader influences not only individual followers, but the team as a whole, to perform optimally, resulting in high quality outcomes. Each team member within a transformation team has a positive influence on the team and other team members, and the success of transformational teamwork is measured by quality outcomes. It is critical nursing professionals examine the incidence of negative patient outcomes occurring within the nursing sector’s locus of control and implement teaching and leadership strategies, including transformational teamwork, to protect patients from the resulting increased morbidity and mortality commonly associated with negative patient outcomes.
Keywords: nursing teamwork, patient outcomes, nurse-sensitive, medical-surgical, pressure ulcer, falls, urinary catheter associated infections, CAUTI, teamwork, transformational teamwork, transformational team
Chapter 1: Introduction to the Research

**Introduction to the Problem**

The current evolution in healthcare challenges nurses in acute care settings to provide safe, holistic nursing care for more patients with increasing acuity, accompanied by an ever-decreasing length of stay. This rapidly changing environment is accompanied by a vital focus on quality patient outcomes. The provision of comprehensive nursing care is a multifaceted process, requiring a team of nursing staff members engaged in complex roles, including assessment, planning, intervention, evaluation, organization, critical thinking, prioritization, delegation, advocacy, and teaching. The recovery and survival of patients in this complex acute care environment is dependent upon a team of nursing staff members engaged in collaborative practices.

The overarching goals of nursing care are to promote health, avoid complications, and assist patients in gaining and retaining optimal wellbeing. Patient outcomes refer to the results of services provided to an individual. Although the majority of patient outcomes are positive, the severity of the problem of negative patient outcomes came to public attention in the Institute of Medicine’s (2000) study entitled *To Err is Human- Building a Safer Health System* in which researchers revealed staggering numbers of negative patient outcomes and patient deaths related to preventable medical errors. Data from subsequent research suggested that only minimal progress had been made in addressing preventable negative outcomes in healthcare (Bluni & O’Shaughnessy, 2009; Reed & May, 2011).
The Joint Commission on the Accreditation of Healthcare Organizations, now known simply as The Joint Commission, linked communication problems and inadequate teamwork as important factors affecting patient outcomes stating, “safety and quality of patient care is dependent on teamwork, communication, and a collaborative work environment” (The Joint Commission, 2008, p. 1). In addition, the Joint Commission (2007) indicated that the lack of team collaboration and ineffective communication were the leading root causes for various types of negative outcomes including fatal falls. Although teamwork is not a new concept to nursing or healthcare, teams in healthcare continue to function in a suboptimal manner (Kalisch & Lee, 2009).

Research related to preventable negative outcomes and quality of care improvements is critical to the nursing profession. Great strides have been made over the past decade in the study of interdisciplinary collaboration between various members of a healthcare team, such as physicians and nurses, and the influence on patient outcomes; however, research on the impact of teamwork within the nursing sector is limited. In addition, recent definitions of nurse-sensitive outcomes, meaning those outcomes specifically related to the quality of nursing care, provide a new opportunity to evaluate constructs of nursing care, such as teamwork, and the impact on specific nurse-sensitive patient outcomes. The intent of this action-oriented research study was to examine the relationship between nursing teamwork and the occurrence of nurse-sensitive quality patient outcomes, with the ultimate goal of incorporating findings into educational and leadership strategies designed to improve patient outcomes.
Statement of the Problem to be Researched

Nurse-sensitive indicators refer to specific measures reflecting the quality of independent nursing care. Quality indicators are considered to be “nurse sensitive” when the provision of nursing care is the primary event controlling the occurrence of the indicators. The occurrence of these indicators, such as falls, pressure ulcers, and urinary catheter-associated infections is, by definition, directly related to the care provided by the nursing staff. Conceptually, high-quality nursing care will prevent these occurrences, while failures in nursing care directly contribute to the incidence of these negative outcomes.

The use of nurse-sensitive outcomes as benchmarks for the quality of nursing care is a relatively new concept in healthcare. The National Database of Nursing Quality Indicators (NDNQI) was established in 1998 as part of the American Nurses Association (ANA) Safety and Quality initiative (ANA, 1999). The ANA developed the national database to collect statistics related to nurse-sensitive quality indicators. NDNQI provides participating institutions quarterly and annual reports related to nursing outcome indicators. The data are reported at the unit level and compared to national benchmarks, allowing institutions to comparatively and longitudinally evaluate nursing care for each separate unit of the institution. Thus, the NDNQI data provide a nationally standardized assessment of the quality of nursing care at the unit level. Analysis of NDNQI data offers the potential to discover new evidence-based practice improvements in the quality of nursing care and patient outcomes.

Although the NDNQI database provides a wealth of information regarding the measurement and occurrence of nurse-sensitive patient outcomes, the multiple interacting
processes impacting those nursing outcomes remains an obscurity. Exploration of the linkages between nursing processes and the NDNQI outcomes was planned in this project as a means to provide needed evidence to promote change in education, leadership, and practice. For example, the relationship of nurse staffing levels and patient outcomes has already been demonstrated through the use of the NDNQI database (Montalvo, 2007). Although prior research has indicated that failures in teamwork result in poor patient outcomes (Dunton, Gajewski, Klaus, & Pierson, 2007; Kalisch & Lee, 2009), the association between that and nursing processes, such as teamwork specifically related to the nursing NDNQI outcome data, was yet to be explored.

It was important to examine these gaps in knowledge and explore the relationship of nursing teamwork within the realm of specific medical-surgical nursing teams and the occurrence of specific nurse-sensitive patient outcomes. Understanding whether an association existed between nursing teamwork and the occurrence of nurse-sensitive outcomes was a potential first step in finding new educational, leadership, and practice solutions to the pervasive problem of negative patient outcomes.

**Purpose and Significance of the Problem**

**Purpose Statement**

The purpose of this research was to investigate the relationship of teamwork within acute care medical-surgical nursing units to specific nurse indicator patient outcomes, including pressure ulcers, patient falls, and catheter-associated urinary tract infections. The short-term goals of the study were to gain a better understanding of unit-based teamwork in nursing, identify key aspects of nursing teamwork, and examine the association between teamwork and the occurrence of specific patient outcomes. The
ultimate long-range purpose of this action-oriented investigation was to further develop a conceptual framework that identifies and defines the concepts of teamwork contributing to quality patient outcomes and guides the formation of educational and leadership strategies that promote nursing teamwork and lead to improved patient outcomes.

**Significance of the Problem**

The Joint Commission noted over a decade ago (2005) that if the rate of healthcare errors and negative outcomes was included on the National Center for Health Statistic’s list of the top 10 causes of death in the United States, preventable errors would rank in the top five causes of death, exceeding the data for medical issues such as diabetes, AIDS, many forms of cancer, Alzheimer’s disease, and accidents. Despite wide-ranging interventions to prevent negative outcomes instituted by many U.S. hospitals, the pervasiveness of these preventable patient safety incidents continues to be expensive on both fiscal and personal levels.

Patient safety and the provision of high quality healthcare are national priorities. The Centers for Medicare and Medicaid Services (CMS) reported that negative patient outcomes plague the entire healthcare system with more than 650,000 patients experiencing a preventable negative patient outcome annually (Bluni & O’Shaughnessy, 2009). Some more recent analyses published by The Leapfrog Group indicated that these initial appraisals might have been underestimated (Leapfrog Group, 2014). This same report indicated that although progress in addressing errors, accidents, injuries, and infections is occurring, the overall progress is sluggish (Leapfrog Group, 2014). Several measures utilized by Leapfrog to measure hospital safety included pressure ulcers, catheter-associated urinary tract infections, and falls (Leapfrog Group, 2014).
Healthgrades, one of the top independent healthcare ratings companies, also analyzed data regarding the safety and efficacy of healthcare throughout the United States. According to Healthgrades’s *Eighth Annual Patient Safety in American Hospitals Study* (2011), approximately 708,642 preventable patient safety events cost the federal Medicare program $7.3 billion and resulted in 79,670 potentially preventable deaths (Reed & May, 2011). The data suggest the issues of patient safety and quality patient outcomes are of paramount importance in 21st century healthcare.

Prior research has also demonstrated that negative patient outcomes occurring as a result of communication and teamwork failures are commonplace. These failures in healthcare teamwork result in serious complications, increased length of stay, increased cost of healthcare, and patient mortality (Dunton et al., 2007; Kalisch & Lee, 2009). A problem associated with inadequate teamwork was also documented in recent nursing literature. Kalisch and Lee (2009) indicated that many nursing teams fail to function as a true team. Rather than working together toward a common purpose, many teams operate: as a collection of individuals who do not engage in the teamwork behaviors of monitoring one another’s performance, backing each other up, engaging in closed-loop communication and effective conflict resolution, or sharing the same ideas and understandings of what needs to be done for the patient and family. (Kalisch & Lee, 2009, p. 324)

The U.S. Bureau of Labor Statistics (2010) indicated there are over 2.6 million Registered Nurses in the United States, making the nursing profession the largest sector of our healthcare industry. One principal subdivision of these nurses is employed in acute medical-surgical nursing units. The impact medical-surgical nurses have on patient care, patient safety, and patient outcomes cannot be underestimated, which thereby
creates a sense of urgency to examine teamwork and patient outcomes in the context of the medical-surgical nursing sector.

**Research Questions**

Research questions were formulated with the long-term goal of identifying solutions to the problem of negative nurse-sensitive patient outcomes. The single primary research question related to the relationship of teamwork and outcomes was derived from professional practice, experience, and previous research. The primary research question of this study was “How does nursing teamwork affect nurse-sensitive patient outcomes?” Several related sub-questions identified more specific quantitative and qualitative exploratory questions to guide the research.

Three research sub-questions guided the quantitative data collection and analysis. The first sub-question addressed teamwork in a general manner questioning whether the factors of teamwork vary across medical-surgical nursing units. This question was addressed as, “What is the variability in teamwork constructs across medical-surgical nursing units?” The second quantitative sub-question built upon the first and sought to identify the existence of general patterns between teamwork and patient outcomes by asking, “What patterns exist across medical-surgical nursing teams when comparing teamwork constructs and patient outcomes?” The third quantitative sub-question most closely mirrored the primary focus of the research and required statistical correlation by asking, “Which dimensions (constructs) of teamwork are associated with nurse-sensitive patient outcomes?” As part of this final sub-question, the researcher had an interest in also identifying whether a relationship existed between the dimensions of inter-shift or intra-shift teamwork and patient outcomes.
Four sub-questions focused on qualitative data. “What descriptors do nursing team members use to define high-quality teamwork?” “What are the leadership traits nursing team members identify as qualities that promote nursing teamwork?” “What barriers of teamwork are identified by nursing team members working in a team environment?” “How do nursing team members describe the impact of teamwork on patient outcomes of falls, pressure ulcers, and CAUTI?” One additional question was explored in both quantitative and qualitative methods. “What is the gap in educational preparation to support nursing team members in performing in a team environment?”

Hypothesis

Based on the primary research question, the null hypothesis of the study stated that nursing teamwork has no effect on nurse-sensitive patient outcomes (falls, pressure ulcers, and catheter-associated urinary infections). The null hypothesis further indicated that the occurrence of each individual negative patient outcome could not be predicted according to the presence or absence of nursing teamwork, and the occurrence of these negative outcomes would be no different than that which would be expected by chance.

Conceptual Framework

Researcher Stances and Experiential Base

Positive patient outcomes are the primary goal of all nursing care. Mediocrity is not acceptable in nursing practice and anything short of excellence in patient outcomes is undesirable. Inpatient acute nursing care is provided within a hospital unit environment in which a team of nurses provides 24-hour care to a group of patients. The team is supported by a nurse leader who directs and facilitates the team’s actions. Nursing research and literature have focused on the need for nurse managers and executives to
engage in a transformational leadership style that facilitates change by inspiring followers and creating a sense of commitment to common goals. Although a transformational nurse leader is critical to achieving excellence in patient outcomes, the leader’s influence on individuals alone, and in isolation from the team as a whole, may result in lackluster or inconsistent performance. Transformational leadership may have the potential to generate improvements in outcomes, but inspiring individual followers is only a partial solution to achieving excellence.

As a former acute care oncology nurse, nurse administrator, and nurse educator, I have witnessed the power of high-performing teams. Thus, the conception of a “transformational team” and “transformational teamwork” arose from practical experience whereby I was the participant or witness to the role teamwork played in affecting outcomes. As the manager of an acute care oncology unit, I focused attention not only on my own transformational leadership style and the individual staff members, but on the team as a whole, and the role teamwork, including inter-shift teamwork, played in improving patient outcomes. It was my belief that teams, as well as leaders, need to be transformational. In what I now term a “transformational team,” the nursing unit manager’s leadership style must transform not only individual followers, but the team as a whole. A transformational team is one in which each team member takes ownership of the team and its results and has a positive influence on the team and other team members, much like a transformational leader has influence on followers. By definition, high-quality transformational teamwork in nursing results in positive patient outcomes.
Evidence in the literature generally supports the notion that high-performing teams lead to better outcomes. This association is also intuitive. Yet, true teamwork in nursing and healthcare is elusive. It is my conviction that a “transformational nursing team,” members of which have a common drive to work together to promote positive outcomes, is vital to achieving excellence in patient care. The synergy created by individuals in a transformational team generates excellence not found when individuals, even if performing at individual levels of excellence, work in isolation.

Promoting teamwork in nursing is not an easy task. However, it is my belief that each nursing team member at any role level and the team as a whole are accountable for achieving positive patient outcomes and avoiding negative ones. Thus, when teamwork can be demonstrated to have transformational powers and positively affects patient outcomes, the implications for nursing leadership, education, and practice are significant. The vision of this research project was to narrow the focus to determine which constructs of teamwork, as defined by prior researchers, have the most influence on nurse-sensitive patient outcomes within a medical-surgical environment. I am hopeful that the research will be of benefit to the nursing profession as a whole, and I envisioned that the concept of transformational teams (new to the literature) will generate renewed interest in looking at teamwork and cultivate a broader theory that propagates and evolves in nursing practice.

Conceptual Framework

The conceptual framework for this study was based upon a theory called The Donabedian Model of Patient Safety (Donabedian, 1980). Donabedian’s Model of Patient Safety described a linear progression from input factors to outcome concepts,
implying that each input component has a direct influence on the outcome for patients. Donabedian’s model described structure-process-outcome interactions and has been utilized by other researchers as a framework for examining health services and assessing patient interventions and outcomes.

Donabedian’s theoretical model (1980) identified two components potentially affecting quality of care and outcomes: structure and process. The first component, structure, was defined by Donabedian as the physical and organizational properties of the care-delivery setting. The NDNQI specified that the structure of nursing care included important concepts such as the supply of nursing staff, educational background of the nursing staff, and the skill level of the staff (ANA, 2014). The educational background included formal education, continuing education, and education leading to certification (NDNQI, 2014). These concepts identified as important structures by NDNQI would, as theorized by Donabedian, impact patient outcomes. Process, the second component, referred to the inputs, treatments, or services being provided to the patient, including nursing care planning and actual interventions.

The outcomes were defined as the results of the two input components. The model suggested that if one alters the structure and/or process, the outcome would be changed (Donabedian, 1980). This model, therefore, addressed how structures and processes, such as teamwork, may have the potential to either result in positive outcomes or cause harm to patients.

Coyle and Battles (1999) further modified the Donabedian Model of Patient Safety. The Donabedian model, with Coyle and Battles’s modifications, is represented in Figure 1. The new version of the model included antecedent conditions present in the
patient’s personal situation that can affect patient outcomes. The antecedent conditions, as identified by Coyle and Battles (1999), included “genetics, socio-demographics, health habits, beliefs and attitudes, and preferences” (p. 7).

Environmental factors included the patients’ “cultural, social, political, personal, and physical” characteristics, along with factors “related to the health profession” itself (Coyle & Battles, 1999, p. 7). In the case of this particular study, the compounding variables included non-nursing or non-teamwork variables such as interdisciplinary processes, disease processes, treatment regimens, patient cooperation, nurse engagement, and various barriers to teamwork and quality care. The complex interrelationship of these multiple factors leads to the eventual patient outcomes (positive or negative).

Notes: The figure depicts how antecedent conditions, structure, and care processes affect patient safety outcomes. Figure adapted by adapted by Coyle and Battles (1999) retrieved from http://www.ahrq.gov/research/findings/final-reports/medteam/figure2.html

Figure 1. The Donabedian Model of Patient Safety

Donabedian (1980) and Coyle and Battles (1999) emphasized the important concept that success in healthcare is measured by positive changes in patient outcomes. Thus, the structure and process inputs must result in corresponding measurable
improvements in outcomes in order to deem a strategy as successful. Thus, in this particular research study, the primary research question, “How does nursing teamwork affect nurse sensitive patient outcomes?” infers that the structure of nursing teamwork would have a resulting impact on nurse-sensitive patient outcomes (those outcomes defined by NDNQI believed to be a direct result of the quality of nursing care).

The review of literature focuses on three themes: (a) the relationship of teamwork to patient outcomes, (b) barriers to effective nursing teamwork, and (c) the roles of nursing leadership and education in promoting teamwork in nursing practice. The roles of leadership and education in promoting teamwork contributed to the action-oriented nature of the research questions, striving to find educational and or leadership interventions to affect teamwork and thereby theoretically impact outcomes.

**Definitions of Terms**

Three specific nurse-sensitive outcomes were chosen as the dependent variables of the quantitative portion of the study: falls, unit acquired pressure ulcers, and catheter-associated urinary infections (CAUTI). These indicators were selected due to the common occurrence of them, the potential morbidity associated with these negative outcomes, and the valid nationally normed NDNQI unit-based data available to analyze these outcomes. Understanding the definitions including the process of measurement of these terms is essential to this research process.

A fall is defined as an occurrence when a patient inadvertently and without purpose comes to rest on the ground or floor (Venes, 2009). The outcome of falls was measured by calculating total falls occurring in patients assigned to a particular nursing unit as well as the two subsets of the total falls category including falls resulting in
patient injury and unassisted falls (defined in a later section). A pressure ulcer is an opening of the skin usually occurring over bony prominences and related to excessive pressure on one area of the skin for long periods of time (Venes, 2009). Pressure ulcers, also known as decubiti ulcers, that formed during the patient’s hospital stay on the particular nursing unit are known as unit-acquired pressure ulcers (UAPU). Pressure ulcers were noted by Healthgrades (2011) to be one of the 13 top patient safety indicators negatively affecting healthcare quality. Catheter Associated Urinary Tract Infection, or CAUTI, refers to the development of a urinary tract infection following urinary catheterization (the insertion of a catheter into the bladder for the purpose of draining urine from the bladder). All three of these negative nurse-sensitive outcomes are costly for the individual, third-party payment plans, and the involved health systems. Successful reduction of these specific outcomes would enhance healthcare and the patient experience.

The definition of additional terms was necessary for full understanding of the specific nature of this study. Although these terms may have broader definitions in a different context, the following definitions were provided to understand the terms as used in the perspective of this study.

**Acute Care**

Patient care specializing in interventions for a brief but serious episode of a disease process or illness (Venes, 2009)

**Backup**

One of the five constructs of teamwork measured by the Nursing Teamwork Survey (Kalisch, Lee, & Salas, 2010). Actions team members take to assist when
another team member is overwhelmed or does not know how to complete the work. Team members helping one another with their tasks and responsibilities (Kalisch et al., 2010)

**Barrier**

An obstacle, obstruction, or anything that obstructs progress (Barrier, 2010). In the context of this research, a barrier refers to a structure, process, or action that interferes with teamwork.

**Catheter-Associated Urinary Tract Infections (CAUTI)**

An infection (bacterial disease) of the urinary tract (UTI) secondary to the insertion of a urinary catheter, which is a tube placed in the bladder used to drain urine from the bladder (Centers for Disease Control and Prevention [CDC], 2015)

**Collaboration**

Multiple agents working toward a common goal – closely related to teamwork, but not synonymous (Collaboration, 2012)

**Fall**

An occurrence when a patient inadvertently and without purpose comes to rest on the ground or floor (Venes, 2009). NDNQI (Press Ganey Associates, Inc., 2012) further defined a fall as “an unplanned descent to the floor with or without injury to the patient, and occurs on an eligible reporting nursing unit” (p. 13).

**Fall, Assisted**

“A fall in which any staff member (whether a nursing service employee or not) was with the patient and attempted to minimize the impact of the fall by easing the patient’s descent to the floor or in some manner attempting to break the

**Fall with Injury**

A fall that results in any level of injury to the patient. The final determination of injury may be assessed up to 24 hours following the occurrence of the fall (Press Ganey Associates, Inc., 2012).

**Interdisciplinary**

Inclusion or overlapping of members of two or more disciplines such as medicine (physicians), dietary, social work, nursing, and other sectors of the healthcare team (Venes, 2009). Also known in the literature as inter-professional team.

**Leadership, Team**

One of the five constructs of teamwork measured by the Nursing Teamwork Survey (Kalisch et al., 2010). The direction and support provided by a formal leader (such as a manager, charge nurse, or facilitator) or members of the team (Kalisch et al., 2010).

**Medical Illnesses**

A wide variety of conditions treated without surgery such as diabetes, hypertension, pneumonia, or other diseases caused by infectious processes (Venes, 2009).

**Medical-Surgical**

Two broad categories of adult health specialties (medical and surgical). An umbrella term used to capture the large majority of care provided by these two services (medical and surgical) in an acute healthcare setting (Venes, 2009).
Morbidity

Illness or abnormal condition (Venes, 2009)

Mortality

Death (Venes, 2009)

NDNQI Nursing Indicator

Patient outcomes reflecting the quality of nursing care. Term used to describe an outcome primarily affected by the quantity and quality of nursing care provided to the individual (Montalvo, 2007).

Negative Patient Outcomes

A complication, side effect, or undesirable consequence occurring while the patient is being treated (Venes, 2009)

Nursing Team

A group of individuals comprised primarily of Registered Nurses (RN) and Unlicensed Assistive Personnel (UAP) assigned to work on a particular nursing unit and whose common purpose is the provision of direct comprehensive nursing care to the patients on that particular nursing unit. Some nursing teams may also include Licensed Practical Nurses (LPN). However, as the acuity of hospitalized patients has increased over recent years, the number of LPNs serving in acute care medical-surgical units has decreased. Thus, in many inpatient medical-surgical units, LPNs are no longer part of the acute care nursing team.

Nursing Unit

A specific geographical area located within a hospital designed to admit a set number of patients. Often, patients with similar conditions or diagnoses are
admitted to the same unit, permitting the healthcare workers on that unit to specialize in the care of patients with those particular medical needs. The individuals working on a particular Nursing Unit comprise the Nursing Team for that unit.

**Patient Outcome**

A broad term used to reflect the result or consequence of the healthcare services provided to a patient (Venes, 2009). Also defined by Donabedian (1980) and Coyle and Battles (1999, p. 7) as “clinical endpoints (i.e., laboratory values, morbidity, and mortality), functional status (physical, mental, social, and role), general well-being (health perception, energy, fatigue, pain and life satisfaction), and satisfaction with medical care (access, convenience, coverage, quality, and general).

**Positive patient outcome**

A desired effect of care provided (Venes, 2009)

**Pressure Ulcer**

An ulceration of the skin usually occurring over bony prominences and related to excessive pressure on one area of the skin for long periods of time. Often occurs in persons confined to a bed or chair. Is generally considered to be preventable with proper nursing care (turning and repositioning, skin care). Sometimes referred to in nursing literature as “decubiti ulcer” (Venes, 2009).

**Shared Mental Model**

One of the five constructs of teamwork measured by the Nursing Teamwork Survey (Kalisch et al., 2010). When members have a collective mindset and the
same conceptualization about what work is to be completed and when and who
will do it (Kalisch et al., 2010).

**Surgical**

Those diagnoses requiring invasive operations (surgery) for treatment of the
condition, such as gallbladder disease, many solid tumor cancers, or hernias
(Venes, 2009).

**Team Orientation**

One of the five constructs of teamwork measured by the Nursing Teamwork
Survey (Kalisch et al., 2010). Cohesiveness and the group’s awareness of itself as
a team. An emphasis is on what is in the best interest of the total team rather than
on the desires of individual team members (Kalisch et al., 2010).

**Teamwork**

Defined by World Health Organization (WHO; 1990) as the “coordinated action
carried out by two or more individuals jointly, concurrently or sequentially.
Implies common agreed goals, clear awareness of, and respect for others’ roles
and functions” (p. 15). Nursing teamwork is teamwork performed by a set group
of nursing staff members.

**Transformational Teamwork**

An original term used by the researcher to define a form of teamwork whereby a
transformational leader influences not only individual followers but the team as a
whole to perform optimally, resulting in high-quality outcomes. Each team
member within the transformation team has a positive influence on the team and
other team members, much like a transformational leader has influence on
followers. The success of Transformational Teamwork is measured by quality outcomes.

**Trust**

One of the five constructs of teamwork measured by the Nursing Teamwork Survey (Kalisch et al., 2010). Belief that team members will act in ways that promote the aims of the team. Confidence in team members that they will complete their part of the work in a quality manner (Kalisch et al., 2010).

**Unit**

As used in this research, a patient care unit is defined as a geographical space within an acute care hospital on which a single nursing team is responsible for the care of the patients housed within that geographical space. Eight distinct units (and the eight distinct nursing teams working on those units) were included in the research sample. The terms unit and team are sometimes used interchangeably.

**Unit Acquired Pressure Ulcer (UAPU)**

A pressure ulcer that was not present when the patient was admitted to a particular unit, but rather formed during the time the patient was present on that particular unit.

**Unlicensed Assistive Personnel (UAP)**

Individuals serving in roles such as nursing assistants or unit secretaries and who are trained to function in an assistive role to nurses in the provision of patient care, as delegated by and under the supervision of the Registered Nurse.
Assumptions and Limitations of the Study

Several assumptions were present in the research design. First, the researcher assumed teamwork was present in some form on all medical-surgical nursing units. In addition, the researcher made an assumption that the level and type of nursing teamwork differed unit to unit. Last, the researcher assumed all nursing team members were agreeable to working as a team member and were willing to work collaboratively with other nursing team members to achieve positive patient outcomes.

The complexities and unique characteristics of teamwork in nursing required a focused and narrowed review. The delimitations of the study or chosen boundaries of the study included teams consisting of acute care medical-surgical nurses and UAP. This particular research study excluded interdisciplinary or inter-professional teams such as teams composed of physicians and nurses. Likewise, the focus of the study did not include teams in specialty areas of nursing practice such as intensive care, emergency care, pediatrics, mental health, or obstetrics. Although the units of study in this research were limited to acute care nursing units, the literature for interdisciplinary teams and specialty teams provided a valuable framework upon which the focus of this study was founded, and those bodies of literature were included in the review of literature. The current literature gap in the area of medical-surgical nursing teams and patient outcomes provided an opportunity to expand the knowledge in this focused area.

The primary limitations associated with the research were related to the study design and methodology. First, the sample was limited to a small population of nurses and UAP working in a single institution. The accompanying assumption was that the nursing teams in this institution are representative of nursing teams in general across the
United States, but the single-site convenience sampling of the population limits the
generalizability of the findings. Likewise, the correlational methodology and lack of a
strict scientific empirical framework also limit causal inferences among the variables
(Creswell, 2008). In addition, because the study investigated the relationship between
negative patient outcomes, and those negative outcomes should be relatively rare
occurrences, the collection of sufficient data required for significance of the findings
proved to be difficult.

The collection of both the teamwork data and the outcome data relied on self-
reporting mechanisms. As with many self-reporting studies, the participant responses
were subject to social bias. Participants may have answered questions according to what
they thought was correct rather than providing full and accurate descriptions of real-life
experiences. The assurance of strict de-identification and confidentiality of reported data
was critical to decrease this bias and limitation. Similarly, although the collection of the
patient outcome data provided to NDNQI was designed to follow stringent protocols, the
self-reporting nature of this data collection process may have also contributed to the
limitations of the study. Additional limitations were inherent with the complexity of the
topic under study. While the independent variable teamwork survey data were collected
over one month and provided a snapshot picture of teamwork at one particular time, a
meaningful measurement of the dependent variable patient outcomes needed to occur
over time, and was collected over one quarter (three months), according to NDNQI
protocol. Thus, the timeframe of the collection of independent and dependent variables,
while similar, was not exact.
The provision of nursing care is a complex phenomenon, and control of the multiple confounding variables was therefore impractical. Individual confounding variables have not been fully addressed and include the nurses’ age, gender, education (such as non-BSN versus BSN Registered nurses), years of experience in the role, length of tenure on the unit, differences in patient diagnosis per unit, and changes in unit membership over the time period of the research. The dependent variable outcomes are a result of not only team variables, but also these sorts of individual variables. While demographic descriptions of each unit are provided in Chapter 4, the data are available only for those individuals who chose to participate in the quantitative survey and may not reflect the actual composition of the nursing unit as a whole responsible for having achieved the dependent variable outcome measurements. Although these factors may limit the generalizability of the research results, it is anticipated the study will serve as an initiation point for future research regarding the topic of nursing teamwork and nurse-sensitive patient outcomes.

One final anticipated issue addressed was that of the additional challenges created when the primary researcher holds dual roles of practitioner and researcher. This situation, sometimes referred to as “backyard research,” is common in action research when the researcher’s intent is to provide an actionable change to one’s own work environment. The primary research investigator was a Drexel University doctoral student, who holds a Master’s Degree in Nursing (MSN) and was employed by the participating healthcare agency as the Director of the institution’s School of Health Sciences, which operates five healthcare educational programs including a Registered Nursing (RN) program. Due to the investigator’s employment at the research site,
respondents may have possessed some role confusion regarding the investigator’s role as a researcher and the role as an administrator in the institution.

Glesne (2010) addressed the issues arising from employer-based research where the competing roles of practitioner-researcher may create additional power-knowledge relations or social interests of the participants. The dual role of researcher and member is not new to research and is a common situation in educational research and action research when the purpose of the research is to connect the domains of theory and practice (Schön, 1987). McMillan and Schumacher (1993) highlighted the advantages of the dual practitioner-researcher roles indicating, “some studies on highly sensitive problems probably could not be done by an outside investigator” (p. 416). The position of the researcher within the research site provided an opportunity for deeper understanding of the experiences and social realities of the participants. “These shared experiences can result in greater levels of trust and more opportunities for joint construction of meaning, while still respecting differences” (Coupal, 2005, para. 17).

Although advantageous in action research, the practice of blending practitioner-researcher roles created the need for the researcher to strictly conform to the ethical guidelines of research, which provided protection for the research participants. Coupal (2005) provided several solutions for the ethical complications created by practitioner-researcher role confusion. These solutions included multiple strategies of validity, provision of voluntary participation, and obtaining informed consent. These issues related to the practitioner-researcher roles were addressed in the ethical framework of this project. In addition, as an administrator in the educational setting, the investigator was removed from the clinical setting and had little direct impact in the clinical setting. The
role clarification issue was addressed as part of the participant’s introduction and consent to the research process. In addition, the research was conducted during the researcher’s “off-duty” hours to further avoid role interference and role confusion. Recognition of identified limitations and plans to reduce the impact of these limitations were important to the successful completion of the research study.

One unanticipated limitation was exposed during the data analysis phase of the research process. A methodology design weakness was identified. The use of aggregated unit-based data significantly altered the power of the study, changing the number of survey participants to an n of 8 (the number of units being studied, and the aggregated unit-based data).

Summary

Researching the impact of nursing teamwork on patient safety and outcomes is vital to the future of the nursing profession, the United States healthcare system and, most importantly, the patients served. Nurse communication, collaboration, and teamwork are complex issues, requiring steadfast leadership, support, education, and intervention to achieve optimum results. Likewise, nurse-sensitive indicators are complex phenomena providing quantitative measurement of the quality of care. Understanding the impact of nursing teamwork in the provision of safe and effective nursing care is critical to establishing process improvements in this facet of nursing practice. This study was designed to examine the phenomena from both quantitative and qualitative views with the goal of providing introductory evidence to support the development of strategies that nursing leadership and education can incorporate into processes to decrease the incidence of nurse-sensitive patient outcomes.
Chapter 2: The Literature Review

**Introduction to Chapter 2**

The review of literature provides background information related to nursing teams, leadership, education, and patient outcomes. The focus of the review is on three themes as depicted in the literature review map in Appendix A and explained in the accompanying sections.

Research regarding patient safety and outcomes continues to be in an important stage of discovery. The review of literature examines current knowledge and research regarding the relationship of nursing teamwork to quality patient outcomes. The review of literature focuses on three themes in the literature: (a) the relationship of teamwork to patient outcomes, (b) barriers to effective nursing teamwork, and (c) the roles of nursing leadership and education in promoting teamwork in nursing practice. The discussion of these three themes provides a basic overview of the problem and research questions.

After first defining the theoretical constructs of nursing teamwork, the overall relationship of teamwork to patient outcomes is explored. Teamwork in healthcare generally refers to two formats. First, interdisciplinary teamwork, also called inter-professional teamwork, occurs between various people such as physicians, nurses, and pharmacists all serving to impact patient outcomes together as a team. Review of the literature for interdisciplinary teamwork provides a critical foundation for the exploration of nursing teamwork.

The second less studied, but equally important, type of teamwork is that occurring within a particular role such as nursing teamwork, which by definition occurs among the
nursing staff on a specific unit. Because the nursing team provides around-the-clock (24-hour) care in an inpatient setting, nursing teamwork can be further subdivided into two forms. The first form of teamwork is that occurring among persons working within the same time period or shift (intra-shift teamwork). The second type of teamwork within a nursing team occurs between shifts over a 24-hour period (inter-shift) and requires exceptional communication, a consistent approach, and unified goals, critical factors in the continuity of care between shifts. The current literature addresses “handoffs” or reporting of information between shifts, but rarely addresses inter-shift teamwork, relationships, conflict, or barriers.

Both inter- and intra-professional teamwork are interwoven into complex processes, which have critical implications for patient safety and quality patient outcomes. The majority of teamwork research in healthcare has focused on the critical nature of inter-professional communication and teamwork, rather than focusing on nursing teamwork (Clark, 2009). In addition to focusing on the inter-professional form of healthcare teamwork, much of the available research focuses on specialty areas of healthcare practice such as women’s health/obstetrics or emergency room or critical care units (Catchpole, Mishra, Handa, & McCulloch, 2008; Clark, 2009; Reader, Flin, Mearns, & Cuthbertson, 2009) rather than the general medical-surgical nursing sector. Investigating unit-specific data within a medical-surgical nursing acute care environment, as opposed to more global institutional data also commonly found in the current literature, will increase the opportunity for nursing leaders and educators to make meaningful interpretations and investigate strategies for implementing unit-specific improvements in collaboration and teamwork.
Barriers to patient care and teamwork (the second theme) are those concepts, actions, and events that interfere with the nursing team’s ability to function as a cohesive unit and produce positive patient outcomes. Identification of barriers assists in understanding the complexity of teamwork and provides insight into potential future quality improvement solutions.

Finally, the intersecting roles of education, leadership, and practice are presented as the third stream in this process. A primary role of nursing leadership on a nursing unit is to guide the team through processes with the goal of achieving quality patient outcomes. The role of nursing education is to provide pre-licensure nursing students and nursing team practitioners with the background knowledge, skills, and attributes required for effective practice. Nursing education occurs both prior to licensure and following employment. Nursing education and nursing leadership therefore directly impact nurses in practice at the bedside and can have a positive impact on processes such as teamwork and the subsequent impact on patient outcomes. Alignment of all three sectors of the nursing profession (education, leadership, and practice) is necessary for effective outcomes. In addition, based on evidence supplied by research, bedside practice is also critical to improving patient outcomes. Available literature suggests a disconnect between nursing education, leadership, and practice.

These three streams of literature provide an overview of the complex topic of nursing teamwork. Following review of the literature, the gaps are identified as a foundation for exploring teamwork from a new perspective. Together, the streams form a comprehensive view of the team structure in providing quality nursing care and foster an understanding of the important role of teamwork as it relates to patient outcomes.
Literature Review

The Relationship of Nursing Teamwork and Patient Outcomes

The first stream of literature introduces the relationship between nursing teamwork and patient outcomes and identifies the global interest in the topic. In addition, current and historical research provides an understanding of the definitions of nursing teamwork and the constructs or components of nursing teamwork, which are utilized in the research. Much of the recent literature related to teamwork in healthcare focuses on interdisciplinary teamwork and specialty groups in healthcare, which provides a foundation for the current study.

**Defining concepts of teamwork in nursing.** Teamwork is defined by WHO (1990) as the “coordinated action carried out by two or more individuals jointly, concurrently or sequentially. It implies common agreed goals, clear awareness of and respect for others’ roles and functions” (p. 15). Teamwork in a nursing unit setting occurs continuously as various team members have interdependent roles, sharing and coordinating the complex work incumbent in patient care and covering for one another throughout a 24-hour period.

Teamwork is a concept that has been studied for decades, and multiple researchers and hundreds of articles have been written about effective teamwork. In the 1930s, Kurt Lewin began his famed work on management and leadership theory. In 1947, he introduced the concept of group dynamics and presented introductory concepts regarding teams. Lewin’s research (1947) developed a concept of force field analysis, which identified both supportive forces and barriers to teamwork. Douglas McGregor (1960) also conducted research identifying characteristics of effective and ineffective
teams. In 1961, Rensis Likert wrote a book entitled *New Patterns of Management*, which, in similar fashion, described an extensive list of the characteristics an effective team would have.

More recent additions to the body of literature include Harvard professor Richard Hackman’s (2002) criteria for effective teams, defined in his book entitled *Leading Teams: Setting the Stage for Great Performances*. Over two decades ago, Katzenbach and Smith (1993) provided a definition of high performing teams, which continues to provide an accurate depiction of current nursing practice. As defined by Katzenbach and Smith (1993), a high performing team is “a small number of people with complimentary skills who are committed to a common purpose, performance goals, and an approach for which they hold themselves mutually accountable” (p. 45). In this early work related to teams, Katzenbach and Smith (1993) indicated that high-functioning teams composed of individuals with complimentary skills and experience are more effective in producing quality results as compared to individual accomplishments. Shulman (1996) and Katzenbach and Smith (1993) hypothesized that teamwork produces improved outcomes in complex systems, such as healthcare, where multiple skills, experiences, critical thinking, synthesis of ideas, and judgments are required in the problem-solving process.

More contemporary research by Salas, Sims, and Burke (2005) further defined teamwork by identifying eight constructs or elements of teamwork. Salas et al. provided an extensive analysis of past research in teamwork and discovered a lack of definition regarding the elements of effective teamwork. The resulting model of teamwork developed by the authors is the critical foundational theory of teamwork utilized in this research. Five of the elements were considered to be core constructs: (a) Team
Leadership, (b) Collective Orientation, (c) Mutual Performance Monitoring, (d) Backup, and (e) Adaptability. The remaining three elements are coordinating phenomena, namely (a) Shared Mental Model, (b) Closed Loop Communication, and (c) Mutual Trust. A representation of this teamwork model is provided in Figure 2 and provides important foundational knowledge related to the teamwork survey tool and research.

Source: Kalisch et al. (2010, p. 44)

*Figure 2. Model of Teamwork*

Kalisch and Lee (2009) studied nursing teams, and confirmed that many nursing teams are ineffective at functioning as a true team. The cross-sectional study included 1,758 nursing staff members from two separate hospitals on 38 different units that
completed a Nursing Teamwork Survey (NTS) developed by Kalisch et al. (2010). Kalisch et al. (2010) subsequently refined and tested the nursing teamwork survey (NTS). Psychometric testing of the survey resulted in a valid and reliable tool designed to measure five of the original eight teamwork constructs: (a) Team Leadership, (b) Backup, (c) Shared Mental Model, (d) Trust, and (e) Team Orientation. Definitions of each construct are provided in Appendix B. The development and testing of the teamwork survey provided a valuable tool for future exploration of this important topic. The five constructs, as well as an overall measurement of teamwork, were assessed through the use of the survey and used as independent variables in the quantitative portion of the current study. The survey is described in detail in the methodology section.

In 2011, Kalisch and Lee published a cross-sectional descriptive study investigating the role of staffing on nursing teamwork in 52 units in four mid-sized Midwestern hospitals. The 2,545 participants (purposive sample) completed the Nursing Teamwork Survey to collect data on the perceived level of teamwork. Findings indicated that higher levels of staffing resulted in improved teamwork. A combination of descriptive statistics, comparison of means, and correlation, was used in the data analysis process. Like many references regarding teamwork in nursing, the article does not directly address quality outcomes. The relevance of the article to the current research study is that if increased teamwork resulted in improved patient safety and outcomes, then staffing would potentially have an indirect impact on outcomes by improving teamwork. While not directly related to teamwork and outcomes, the study’s clinical
relevance to patient care is high. It essentially establishes staffing as an antecedent to teamwork.

Many individuals use the terms “teamwork” and “collaboration” interchangeably. Other scholars, however, note subtle differences between the two concepts. Teamwork is the general concept of people working together toward a common goal (Campbell, 2011). Campbell indicated that a team is directed by a leader and that strong leaders can produce positive outcomes even when the team members are not in agreement. In contrast, collaboration is a structured process in which two or more people work together toward a common goal by sharing knowledge, learning, and building consensus. According to Campbell (2011), collaboration does not require leadership and is an effective decentralized process resulting in improved outcomes. Campbell’s (2011) more recent definitions mirror that of Mailick and Ashley (1981) who indicated that collaboration in healthcare emphasizes shared responsibility and consensus building among team members (Mailick & Ashley, 1981). Similarly, according to Baggs and Schmitt (1988), collaboration involves the synchronization of individual actions, cooperation, and interpersonal sharing of goals, problem solving, decision making, and responsibility. Collaborative decision making is a less autocratic and more democratic process in which all team members contribute toward reaching a common goal. This concept of collaboration is essential to the work of nursing teams. Although the majority of nursing teams have defined leaders, the day-to-day operations occurring in a medical-surgical environment do so without direct supervision of the nursing leaders. Nurses work independently within their respective teams to provide care to patients, and collaboration between members of the nursing team is required for successful teamwork to occur.
**Interdisciplinary teams in healthcare.** For the past two decades, healthcare researchers have widely studied the critical effects of interdisciplinary collaboration and teamwork (Baggs et al., 1999; Clark, 2009; Dunton et al., 2007; Manojlovich, Barnsteiner, Bolton, Disch, & Saint, 2008; Surgenor, Blike, & Corwin, 2003). Knaus, Draper, Wagner, and Zimmerman (1986) provided one of the earliest records of the role of interdisciplinary teamwork in intensive care settings. This early study provided evidence of the need to focus attention on the role of teamwork in quality patient outcomes.

More recently, Andreatta (2010) developed a typology for healthcare teams indicating that interdisciplinary healthcare teams consist of a variety of professionals with diverse educational and clinical competencies. Team members’ personal differences in philosophical, political, social, and clinical views create wide-ranging team structures and processes. Andreatta’s study describes the roles within teams across multiple settings to create a model for high-functioning healthcare teams. The qualitative research methodology utilized was in vivo observational data collection followed by semi-structured interviews for clarification and verification. Comparative data analysis resulted in a typology of four kinds of teams, suggesting that no single model of team structure or process is adequate to use across all of healthcare. The complicated and variable nature of healthcare suggests that teams in healthcare may be more complicated than non-healthcare teams. This research was conducted in the interdisciplinary setting as opposed to a purely nursing team structure as utilized in this author’s research. However, the research is valuable in addressing the complicated and variable nature of teams in healthcare and the difficulty in finding a single set of strategies to guide team
processes and competencies in healthcare. The unique typology may provide a starting point for future research in team development and strategies to impact quality care.

The 2010 Institute of Medicine (IOM) report “The Future of Nursing: Leading Change, Advancing Health,” written in collaboration with the Robert Wood Johnson Foundation, described the understanding that teamwork and collaboration are critical to improved healthcare decision-making (IOM, 2010). The IOM report emphasized the need for education to incorporate teamwork strategies into curricula to eliminate the current siloed care typically found in healthcare organizations. Siloed care is a term used to describe the manner in which the members of various disciplines in healthcare such as nurses, pharmacists, respiratory therapists, and physicians operate “in siloes” or void of the necessary interdisciplinary communication or coordination. Mary Wakefield, a healthcare administrator, stated, “As the health care community is looking for new strategies, and new ways of organizing to optimize our efforts—teamwork is fundamental to the conversation” (Robert Wood Johnson Foundation, 2011, p. 2). This IOM report provided important empirical evidence focusing on the critical value of interdisciplinary teamwork and the need for teamwork to be incorporated into healthcare education.

**Specialty teams in healthcare.** Much of the available research on teamwork focuses on specialty areas such as women’s health/obstetrics (OB), emergency care units (ECU), the Operating Room (OR), or intensive care units (ICU) (Catchpole et al., 2008; Clark, 2009; Reader et al., 2009). Catchpole et al. (2008) studied teamwork and the occurrence of errors in the operating room. The researchers utilized direct observation during 48 surgical procedures and evaluated the nursing team along with surgeons and
anesthetists. The conclusion of this study was that teamwork impacts patient outcomes in the operating room.

Similar research findings have been reported from intensive care units (ICU) and emergency care units (ECU). Reader et al. (2009) concluded that effective teamwork is a critical component for optimal patient care in the ICU. Their review of literature and data synthesis resulted in descriptive categories of several important team functions affecting patient care. These functions included team communication, team leadership, team coordination, and team decision-making.

Further, Kaissi, Johnson, and Kirschbaum (2003) utilized a survey to measure teamwork and patient safety attitudes in nurses from the operating room, emergency room, and intensive care units in four hospitals. The results indicated that nurses overwhelmingly favored a team approach but believed that teamwork in its current form had severe limitations, negatively impacting patient care and patient outcomes.

Research in acute care medical surgical settings rather than in the specialty areas of OB, ECU, and ICU is limited. The narrow historical perspective provided by past research in the topic of teamwork provides important opportunities to delve into the subject from the new angles as conducted in this study. The study of nursing teamwork in acute care medical-surgical settings provides a new perspective and additional knowledge with the potential to positively affect patient outcomes.

**Nursing teams and patient outcomes.** The definition of nursing unit teamwork, its design and its effectiveness, has been only minimally researched representing a gap in the literature. Although sparse, the available research on nursing teamwork demonstrates important relationships to patient outcomes. Schaefer, Helmreich, and Scheidegger
(1994) suggested that 70-80% of healthcare errors are associated with poor team processes such as communication. One decade later, Page (2004) verified that minimal progress has been made and interpersonal communication failures occurring within the healthcare team remain a primary factor in up to 70% of healthcare errors and sentinel events.

The provision of comprehensive nursing care in an acute care setting is a complex process, requiring 24-hour, around the clock interventions. Thus, a team of individuals is essential to providing quality nursing care. The nursing team plays a critical role in providing patient care, assuring patient safety, and achieving quality patient outcomes. The Institute of Medicine (IOM, 2004) found that “how we are cared for by nurses affects our health, and sometimes can be a matter of life and death” (p. 2). In addition, the IOM (2004) concluded, “nurses are indispensable to our safety” (p. 2). Nurses are considered to be “a safety net” and key participants in the process of recognizing and intervening to prevent or correct errors that often have the potential to create life-threatening events (Rothschild, Hurley, Landrigan, & Cronin, 2006).

Negative patient outcomes in the form of healthcare errors typically occur as a cascading system of events rather than one individual’s single act of omission or commission. The “Swiss Cheese Model of System Accidents,” developed by Reason (2000), offers an explanation of how ineffective teamwork results in errors. Reason indicated that an effective team system provides multiple layers of checks and balances that serve to prevent errors from occurring. Team members working on an effective team will “catch” an error of another team member before an adverse event occurs. Members of a high-functioning team are aware of the strengths and vulnerabilities of one another,
and are comfortable working together and interacting with each other for a common goal. However when individuals do not work effectively as a team, individual vulnerabilities and weaknesses act much like the holes in Swiss Cheese and sometimes the multiple facets of an error line up in such a way that an error (the hole) gets all the way through the system and an adverse event occurs. Poor teamwork results when individuals work in isolation from each other, accept no responsibility for the work of their teammates, and feel no remorse for the adverse events involving their team members (Reason, 2000).

![Swiss cheese model by James Reason published in 2000.](image)

Figure 3. Swiss cheese model by James Reason published in 2000.

One large exploratory cross-sectional analysis of 390 nurses and 11,496 medical and surgical patients examined nursing collaboration, a closely related concept to teamwork, and reported an inverse relationship between nursing collaboration and failure to rescue (Boyle, 2004). Boyle defined failure to rescue as a patient mortality following
hospital acquired incidents such as a falls, pneumonia, urinary tract infections, pressure ulcers, or cardiac arrest.

In addition, a comprehensive study conducted by Dunton et al. (2007) demonstrated that nursing workforce characteristics impacted patient outcomes, patient complications, length of stay, and patient mortality. Kalisch, Curley, and Stefanov (2007) conducted similar research demonstrating that nursing teamwork leads to increased patient safety and improved quality of care as evidenced by a decrease in patient falls, improved staff retention, and improved staff satisfaction ratings.

Pronovost et al. (2011) discussed the current problems with hospital-acquired infections, one of the dependent patient outcome variables in the current research study. The authors provide a comprehensive research plan outlining the need to develop strategic hospital-acquired infection prevention programs. The article defined a five-phase research agenda to reduce preventable harm: (a) Discovery of causation, (b) testing of interventions, (c) developing evidence-based guidelines of interventions, (d) translating guidelines into clinical practice, and (e) implementing and evaluating work on national and international scales.

Nursing has long used the “five rights” (patient, drug, dose, route, and time) to describe safe medication administration. However, approximately 1.5 million preventable drug errors occur annually in the USA, resulting in a cost of $3.5 billion (IOM, 2006). MacDonald (2010) provided evidence that this issue is a global concern and contended that to promote quality outcomes in this high-risk process, a new model is required. The article, directed at the global nursing audience, is not a report on new research, but rather draws from the relevant literature to introduce a new model of care.
delivery believed to provide an improvement in patient safety. MacDonald’s overall purpose was to describe the importance of including the patient as part of the nursing team. This concept in clinical practice is critical and reinforces a current philosophy in clinical practice called patient-centered care. Similar to other references such as Andreatta (2010), MacDonald described the importance of nursing teamwork to patient safety and outcomes. However, in contrast to many citations, this article focused on the unique perspective of including the patient in the team processes.

**Global interest in nursing teamwork.** The study of teamwork and patient outcomes is of international interest. Countries around the world, including Canada and Great Britain, have reported similar statistics regarding preventable adverse patient events. One study from Taiwan was performed in response to the “serious accidents within medical treatment in Taiwan since 2002” (Yang, Wang, Chang, Guo, & Huang, 2009, p. 959). Yang et al. performed a cross-sectional study related to the influence of leadership behavior on patient safety in the hospital environment. The study and findings mirror the studies in the United States and throughout the world, indicating the global interest in this subject.

Similarly, Chang, Ma, Chiu, Lin, and Lee (2009) conducted a cross-sectional survey to investigate perceptions of teamwork, job satisfaction, and quality of patient care in four acute care hospitals in Taiwan. The sites were religiously affiliated hospitals of various sizes (400 to 1,200 beds). The 1,475 participants included members of the interdisciplinary team including physicians and nurses. An original tool written by the authors provided data on perceptions of teamwork and job satisfaction. Validity and reliability statistics were provided. Statistical analysis included descriptive statistics,
one-way ANOVA, and regression. Findings differed in various groups with nurses citing more teamwork, but physicians demonstrating more satisfaction with teamwork.

The authors concluded that the quality of inter-professional relationships has a substantial impact on the perception of patient outcomes and job satisfaction. Like the majority of available studies, the focus of teamwork was based on interdisciplinary nurse-physician collaboration, rather than on nursing teamwork. Unlike the current research, the quality of care was based on the perceptions of the participants, rather than on utilizing objective numerical patient outcome data. The importance of the study is related to the evidence that there is a global interest in the issue of healthcare teamwork and patient outcomes.

Similarly, Cioffi and Ferguson (2009) conducted an exploratory qualitative study designed to identify and describe nurses’ experiences of teamwork in acute-care hospitals in metropolitan Australia. Financial and demographic changes in the Australian healthcare system have established team nursing as a new model. Focus group interviews were utilized for data collection. Six broad categories of findings were reported, including benefits of team nursing, team approach, team effectiveness, increased responsibility, availability of support, and engagement with the multidisciplinary team. Similar to studies conducted in the United States (Andersen, Jensen, Lippert, & Ostergaard, 2010), nurses reported that team nursing resulted in improved patient outcomes. Also similar to other studies in the United States (Andersen et al., 2010) and abroad (Chang et al., 2009), the nurses reported similar antecedents, such as communication, as critical indicators of successful team processes. These studies demonstrate the global interest in issues related to nursing teamwork.
Barriers to Effective Nursing Teamwork

The second theme, barriers to effective nursing teamwork, provides insight into the obstacles inhibiting effective teamwork. It is important to identify barriers that interfere with the nursing team’s ability to produce positive patient outcomes. One of the first obvious barriers to promoting effective teamwork is the complicated nature of healthcare teams. There is no single set of criteria to describe teams or teamwork in the nursing profession. Andreatta’s (2010) typology for healthcare teams addressed the multiple formats of teams in healthcare and suggests that the approach to guide team processes may vary from setting to setting and team to team.

A project sponsored by the California Primary Care Consortium Subcommittee on Interdisciplinary Collaboration (Grant, 1995) divided barriers to teamwork into three major categories including organizational barriers, such as the lack of knowledge and appreciation of the roles of other health professionals; barriers at the team level, such as lack of a clearly stated, shared, and measurable purpose; and barriers faced by individual team members, such as split loyalties between the team and one’s own discipline.

Lencioni (2002) presented a pyramid model of teamwork naming five barriers or dysfunctions of a team. These barriers mirror much of the teamwork research in nursing and include items such as the absence of trust stemming from an unwillingness in the team members to be vulnerable and genuinely open up with one another about their mistakes and weaknesses, fear of conflict and inability to debate in a constructive manner, lack of commitment to team goals, and avoidance of accountability when team members hesitate to call their colleagues on their actions and behaviors that are counterproductive for the team. Lencioni (2002) indicated that the above barriers and
the lack of accountability result in a dysfunctional state where team members focus more attention on their individual needs rather than on the team’s collective goals.

Opie, in 1997, also discussed barriers to teamwork and cited the frequent staff changes as a complication to team learning. In addition, Opie named additional barriers as failure to appreciate the value of different roles, power struggles, poor attitudes of individual team members, the presence of less experienced workers impacting conflict and compromise, and the issue of poor communication (which tends to be common to almost all theories related to barriers in teamwork).

The United States Department of Defense’s Patient Safety Program, in collaboration with the U.S. Agency for Healthcare Research and Quality (USAHRQ; n.d.), a division of The U.S. Department of Health and Human Services, has utilized over two decades of teamwork research to design an evidence-based teamwork program called Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS™). These agencies utilized an organizational view of teamwork and developed a detailed process for healthcare institutions to assess, train, and implement processes intended to improve inter-professional communication and teamwork skills with the eventual goal of impacting patient outcomes. The barriers identified by the work of USAHRQ are listed in Table 1.
Table 1

*Barriers to Team Performance as identified by TeamSTEPPS™*

<table>
<thead>
<tr>
<th>Inconsistency in team membership</th>
<th>Conflict</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of time</td>
<td>Lack of coordination and follow-up</td>
</tr>
<tr>
<td>Lack of information sharing</td>
<td>Distractions</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>Fatigue</td>
</tr>
<tr>
<td>Defensiveness</td>
<td>Workload</td>
</tr>
<tr>
<td>Conventional thinking</td>
<td>Misinterpretation of cues</td>
</tr>
<tr>
<td>Varying communication styles</td>
<td>Lack of role clarity</td>
</tr>
</tbody>
</table>

Source: USAHRQ (n.d.)

A recent research study examined the facilitators and barriers experienced in nursing practice. Oelke et al. (2008) used a mixed methodology design to identify the barriers experienced by nurses in their scope of practice. The purpose was to understand the perceptions of nurses regarding their ability to work to the extent of their scope of practice and identify barriers and facilitators in meeting role expectations. The published article contains results of the qualitative portion of the research. Participants were selected from 14 acute care units in three regions of Canada. Face-to-face semi-structured interviews were conducted. Thematic analysis of transcripts revealed commonly identified barriers, including heavy workload, high patient acuity, lack of time, poor communication, and ineffective teamwork. Lack of teamwork and collaboration were identified by nurses at all levels. Participants indicated that the need to work as a team was the most critical determinant in being able to do one’s job as a nurse effectively. Strong and supportive leadership was also identified as a key factor.
affecting collaborative practice. The study was supported by the Canadian Health Services Research Foundation and the Alberta Heritage Foundation for Medical Research. The study supports the importance of continuing research regarding nursing teamwork and development of strategies to improve nursing teamwork.

Similarly, Kalisch and Begeny (2005) identified several barriers to effective teamwork and collaboration including a large team size, instability of the workforce and assignments, the absence of a common purpose, and an inhibiting physical environment. Another barrier to teamwork success is the rate of nursing staff turnover (Force, 2005). Nursing staff turnover results in a frequent change in team members, which temporarily destabilizes the team structure. The retention of valuable nursing team members is a critical element in team culture and success. National hospital nursing turnover rates exceed 20% (Force, 2005). A high turnover in nursing teams affects cohesiveness and outcomes and requires constant re-orientation of new employees (Force, 2005). Research further indicates that nursing leadership style and management behaviors directly influence nurses’ decisions to remain or leave an institution (Cullen, 1999; Force, 2005). Thus, a nurse leader who appreciates the relationship of nursing leadership style to its effect on staff retention has the ability to ultimately affect teamwork and patient outcomes.

A single qualitative study conducted by O’Leary et al. (2010) investigated teamwork on inpatient medical units, focusing on assessment of attitudes and barriers to teamwork. The study of 159 participants from four Chicago inpatient medical units provided important data reflecting barriers to effective teamwork on acute care inpatient medical units. Participants provided input regarding teamwork and collaboration both
within their own discipline and from an interdisciplinary view. The quality of communication and collaboration was rated and perceived barriers were identified and studied. Findings were significant in that physicians rated the quality of teamwork as high, but the nurses within the same teams perceived teamwork to be lacking.

Similarly, Thomas, Sexton, and Helmreich (2008) also discovered findings indicating that nurses and physicians view teamwork from different perspectives. This cross-sectional survey of 320 subjects (90 physicians and 230 nurses) from eight non-surgical intensive care units in six Texas hospitals found that while only one-third of nurses rated the quality of teamwork as satisfactory, 70% of physicians rated collaboration and communication with nurses as high or very high. Barriers reported by nurses included inadequate conflict management, difficulty speaking to physicians, and perceived lack of value associated with nursing viewpoints and input.

In an interesting analogous description of nursing teamwork entitled “Translating Knowledge from Motor Racing to Healthcare,” authors Catchpole, Sellers, Goldman, McCulloch, and Hignett (2010) compared healthcare to motor racing and described a key teamwork structure called patient handovers. Patient handover occurs when one healthcare individual hands over care of the patient to another healthcare provider. This happens at various times, including at the end of procedures or at the change of shifts. Poor communication has been linked to healthcare errors, and this form of communication is critical to patient safety. This is a follow-up article to a study published in Pediatric Anesthesia in 2007 in which Catchpole’s research demonstrated that implementing a new handoff protocol significantly reduced the number of errors and communication omissions when transferring patients. Catchpole was motivated to
conduct this research by watching the auto racing pit crews make amazingly complicated, reliable, and complete transformations in a matter of seconds. “What they were doing was incredibly reliable, but what we were doing in health care was far less reliable” (Saver, 2011, p. 11).

Similar to the motor racing study of handoff phenomena conducted by Catchpole et al. (2010), Welsh, Flanagan, and Ebright (2010) investigated the role of teamwork in the handoff process. Handoffs, as previously described, require concise, yet comprehensive, communication and exchange of critical information about the patient from the current caregiver to the new member of the team assuming responsibility for the patient’s care. Errors in communication can lead to negative outcomes and safety risks. The authors define end-of-shift reports or handouts to consist of three distinct stages: exchange of information (content transfer), clarification (asking and answering questions), and historical review (review of lab work, charts, documentation). The authors conducted interviews of practicing nurses to assess the differences in two forms of end-of-shift handoff processes (taped and written). Semi-structured interviews of 20 participants revealed, “inadequate information, inconsistent quality, limited opportunity to ask questions, equipment malfunction, insufficient time to generate reports, and interruptions, limited handoffs” (p. 1). The article provides a specific view at a single process embedded within the general overarching teamwork process. Multiple processes such as this affect nursing teamwork. Nurse educators, leaders, and practitioners need to engage in further research to discover best practices related to communication within the nursing team.
The handoff process or inter-shift report was a widely researched phenomenon in the past decade. This reporting process is primarily informational, and much of the literature deals with the methodology for improving the handoff process. However, missing from the literature related to this inter-shift phenomenon is the role of teamwork, interpersonal relationships, personal interactions from shift to shift and the consistency of nursing practice shift-to-shift impacting patient outcomes. Anecdotal evidence indicates that shift-to-shift interactions are often strained and counterproductive. Nursing teamwork is hampered by these negative interactions between shifts, including a non-supportive environment for new graduates as well as the incidence of lateral and horizontal violence.

The phrase “nurses eat their young” is widely recognized as a common occurrence within the profession, describing the historically non-supportive environment for new nursing graduates. According to research, 18.1% of new Registered Nursing graduates resign from their first nursing position within one year of starting their job, and 26.2% leave within two years (Kovner, Brewer, Greene, & Fairchild, 2009). New nurses report that a lack of peer support contributes to this mass exodus (Kovner et al., 2009). This statistic is troubling and represents an opportunity for tremendous improvement in team practices within the nursing profession.

The terms “horizontal violence” and “lateral violence” are closely related concepts describing negative interactions within the teamwork environment. Lateral violence is defined as a broad concept including any behavior deemed inappropriate or confrontational, including all forms of verbal, physical, and sexual harassment between coworkers (Rowell, 2010). The International Council of Nurses (ICN; 2004) defines
workplace violence as “behavior that humiliates, degrades, or otherwise indicates a lack of respect for the dignity and worth of an individual” (ANA, 2006, para. 1).

Healthcare, along with social assistance and personal care occupations, account for as much as 60% of workplace assaults (Restrepo & Shuford, 2008). Creating a culture of patient safety within the nursing profession will require additional research and intervention into eliminating these major barriers to effective teamwork.

In addition to horizontal violence and poor interpersonal relationships, nurse engagement is a commonly examined phenomenon in current nursing practice. The term engagement as it refers to nursing service is the level of involvement and satisfaction experienced by nurses in the work environment. The term “burnout” is the antonym of engagement. Burnout has been the focus of numerous nursing research studies that have demonstrated poor outcomes related to high levels of nurse burnout. However, nurse engagement and burnout are not well understood in nursing practice. Research conducted by Freeney and Tiernan (2009) focused on engagement and again demonstrated the universal or global interest in this phenomenon. This Irish study identified barriers to nurse engagement such as “workload, control, reward, fairness, community and values” (p. 1). The significance of the findings as related to the author’s interest is in that of the concept of community or the sense of a positive connection with others as is experienced in teamwork. When this connection is lacking, the individual is at a higher risk of burnout. This research adds a new element (engagement) to the study of teamwork. The link between engagement and teamwork and the eventual effect on quality patient outcomes is an area for future research.
Education and Leadership Roles in Promoting Nursing Teamwork

The three sectors of the nursing profession (leadership, education, and practice) each play a role in teamwork and outcomes. Leaders alone do not produce quality patient outcomes, regardless of the quality or type of leadership practiced. Rather, it is the leader’s ability to influence the team to work in a cohesive manner toward a shared vision that produces high-quality outcomes. Likewise, nursing education plays a role in teaching the skills, attributes, and importance of teamwork in healthcare. All sectors of the nursing workforce, leadership, education, and practice share the responsibility for impacting quality patient outcomes.

The primary goal of nursing leadership is to facilitate and operationalize processes that foster the nursing unit’s goal to assist each patient in achieving recovery, rehabilitation, and the return to a state of well-being, while at the same time preventing complications and negative patient outcomes. Leadership at every level of management plays a role in promoting patient safety. The 2004 report by IOM concluded that effective leadership was a critical factor in creating and sustaining a positive work environment and a culture of safety.

Leadership’s influence on outcomes in healthcare has been less researched and developed as compared to the extensive study of management in the corporate world (Flin, Winter, Sarac, & Raduma, 2009). The business sector has documented both the role of leadership in affecting business performance and productivity (Flin et al., 2009) and the influence of leadership in workplace safety (Hofmann & Morgeson, 2004). This connection between leadership and patient outcomes has been less well established in the nursing literature.
Two culture-enriching processes discussed in current nursing literature include teamwork as an important segment of an overall culture change designed to increase team accountability, engagement, and ownership in nursing outcomes. The first of the two processes discussed in the literature is the Toyota Production System Principles, also referred to as lean production, adopted and adapted by the Virginia Mason Institute. The second is Creative Healthcare Management’s *Relationship-Based Care: A Model for Transforming Practice* (Koloroutis, 2004). Both cultural paradigms emphasize teamwork as a critical element of success and address the need for nursing education, practice, and leadership to work in concert together.

Beginning in 2002, the Virginia Mason Institute introduced an organization-wide culture change focusing on improving patient safety and quality. The focus of the teamwork strategy is on patient safety and requires each employee be empowered to be an inspector and advocate for safety. Thus, each employee has the authority and responsibility to immediately halt any process believed to be done incorrectly or to be negatively impacting patient safety. The Virginia Mason Institute was first inspired by their local Boeing company who adopted the principles of the Toyota Production System resulting in drastically reducing the construction time while building a safer aircraft at less cost. The organization studied and adapted the Toyota Production System (lean production) to their healthcare system, calling it the Virginia Mason Production System. Much like the earlier comparisons of healthcare safety to that in the airplane industry, the Virginia Mason Institute focused on operating in a manner that emphasized the concepts of quality and safety, but also included customer satisfaction, staff satisfaction, and cost effectiveness. Believing every patient should experience high quality and excellence in
healthcare, the organization emphasized continuous improvement in everyday activities throughout the entire organization, including nursing service (Virginia Mason Medical Center, 2014).

Compared to the average hospital, nurses at Virginia Mason Medical Center spend 55% more time in direct care activities. They changed the manner by which nurses are assigned to patients, working within a team with the UAP in cells or groups of rooms in close proximity with each other. This team model permits a nurse to make more rapid assessments and respond to patient needs more efficiently (Virginia Mason Medical Center, 2014).

The team model was described as a system of management in which all employees “are aligned through a common language, a common way of solving problems, and a common set of cultural values” (Association of American Medical Colleges [AAMC], n.d., p. 4). “The culture changed so working in teams is now the rule, not the exception” (AAMC, n.d., p. 10). The Virginia Mason Institute indicated that the change resulted in improvements in patient outcomes, including shorter lengths of stay. In addition, patient falls were reduced from 3.33 falls per 1000 patient days in 2006 to 2.33 in 2010.

Likewise, Relationship-Based Care (RBC) is a cultural model emphasizing the need to improve relationships with self (self-care), patients and families, and peers (healthcare team). The common goal is to improve relationships throughout the entire organization. Teamwork is one of the critical elements of the Relationship-Based Care model structure. Using the premise of Relationship-Based Care, leadership and teamwork focus on improving relationships within the organization, believed to impact
patient outcomes and safety. Several recent articles review the relationship between Relationship-Based Care and outcomes. Cropley (2012) provided evidence of a relationship between implementation of RBC and patient satisfaction, length of stay, and readmission rates in hospitalized patients.

Multiple other students have been conducted demonstrating the importance of leadership, teamwork, and outcomes. Rathert and Fleming (2008) conducted a cross-sectional field study of teamwork and confirmed that leadership played a critical role in promoting teamwork and quality patient outcomes. They concluded that leaders of teams are critical to promoting trust and respect within the team as well as to advancing the concept of continuous improvement, leading to improved patient outcomes (Rathert & Fleming, 2008).

Vogus and Sutcliffe (2007) performed a cross-sectional analysis study of 1,033 Registered Nurses and 78 nurse managers in 10 acute care hospitals analyzing medication errors. Their analysis demonstrated the critical role of nursing leadership in establishing a trusting environment to assist teams in the provision of safe and effective nursing care. High-performing teams require engaged leaders who are able to provide vision and clarity regarding the team’s purpose and mission and steer the team in the direction of success.

Andersen et al. (2010) conducted a qualitative study focusing on the identification of non-technical skills in a healthcare team environment including leadership, task distribution, communication, and the associated barriers to teamwork. The purpose of the research was twofold: to identify the skills required of team members in the provision of cardiac arrest care and to identify the barriers to teamwork that impede team
performance. The participants in this study were Danish Advanced Life Support faculty. The researchers conducted individual semi-structured interviews. Barriers to effective team performance identified in this study included inexperienced leadership, task overload, and a hierarchical structure resulting in the teams’ inability to maintain focus on tasks. Although not directly related to nursing teams, the article provided interesting information regarding the importance of leadership in a team. The participants reported that the inexperience of team leaders greatly affected the quality of treatment and outcomes.

McCulloch, Rathbone, and Catchpole (2011) investigated healthcare leadership’s previous attempts to implement teamwork training programs. The authors conducted a systematic review of the literature on the effects of teamwork training for healthcare staff. The purpose of this review was to investigate the assumptions that implementing teamwork programs leads to improved patient safety. The evidence to support this assumption remains ambiguous. Data included staff beliefs and attitudes, teamwork skills, technical performance, effectiveness, and patient outcomes. Fourteen articles from a series of over 1,000 relevant abstracts were analyzed. Authors concluded that, in general, the quality of the evidence supporting teamwork interventions in improving patient care was poor. The reviewed articles included four randomized trials and 10 non-randomized studies. Critical analysis revealed issues with subjective measures and Hawthorne effects. Most of the analyzed articles reported improvements in staff attitudes, teamwork, technical performance, efficiency, and patient outcomes. However, evidence of clinical benefit in three articles was of borderline or modest significance. Of significance is that none of the randomized trials found evidence of technical or clinical
benefit post-teamwork training. This article supports the need for additional investigation of the underlying assumptions related to teamwork in order to better craft effective teamwork interventions that provide more conclusive evidence of successfully impacting patient outcomes.

Fullan (2008) described secret number two in his book *Six Secret’s of Change* as the leader’s responsibility to connect peers with a common purpose. Fullan described the need for leaders to combat fragmentation within an organization and achieve a cohesive vision. Rather than employing a top-down leadership style, Fullan proposed that purposeful peer interaction toward a common goal (such as positive patient outcomes) will produce improved results. “Leaders have to provide direction, create the conditions for effective peer interaction, and intervene along the way when things are not working as well as they could” (p. 49). Fullan’s we-we solution concludes that purposeful peer interaction will create an atmosphere in which team members focus on achieving the organizational purpose such as patient safety and quality outcomes. Implementation of Fullan’s theory of connecting peers with a common purpose would encourage nurses to change their mental model from “my assigned patients” to a model of “our unit’s” or “our organization’s” patients, focusing on a shared team approach to patient care.

The shared vision and purpose as defined by Fullan (2008) corresponds to the leadership philosophy called transformational leadership. Transformational leadership is the model often applied to the study of managers and safety (Bass, 1998). The concept of transformational leadership was first described by Burns (1978) who proposed that a transformational leader identifies and communicates a shared vision or direction for the group or team. A transformational leader creates a vision to create change in an
organization, and then inspires followers to work toward that vision. This is in contrast to transactional leaders who set agreed upon goals and then lead by means of monitoring performance and administering reinforcement accordingly (Flin et al., 2009).

Transactional leadership may result in teams meeting the expected performance levels, while adopting a transformational leadership style provides followers with a sense of purpose, inspiring followers to be high achievers (Flin et al., 2009).

Transformational leaders motivate others to a higher level of performance (Dunham-Taylor, 2000). The value of transformational leadership as it relates to teamwork is summarized by Dixon (1999) in the following quote, “Individually everybody brings strength and expertise to the team. Nobody brings everything the team needs. But collectively we have more than what the team needs” (p. 19). Dunham-Taylor (2000) supported the claim that higher group effectiveness resulted from nurse leaders increasing their utilization of a transformational leadership philosophy. This compounding evidence supports the concept that nursing leadership plays a critical role in creating and directing high-performance teams toward quality patient outcomes.

In an interesting article written by management and operations specialists who are not engaged in the healthcare sector, teamwork in healthcare is compared to other complex organizations. McFadden, Henagan, and Gowen (2009) first defined high-reliability organizations (HROs) as organizations or systems that achieve consistent error-free performance while operating in multifaceted and precarious conditions. An example of a HRO is the aviation industry. Healthcare, the authors postulated, should be a HRO, but consistently falls short of that definition. Failure rates and errors dominate the healthcare industry in staggering numbers. The authors hypothesized that HRO status
can be achieved by the healthcare industry through a systematic process linked to top leadership. The goal of their study was to investigate the existence of a patient safety chain for hospitals. Although literature does not support the actual existence of a patient safety chain, the authors drew upon their experience in other industries and the high-reliability organization theory, multifactor leadership theory, and total quality management literature. McFadden et al. hypothesized that improving patient safety begins at the highest level of the organization with a transformational leadership style.

This theory of the role of senior leadership as the key is similar to the research conducted by Kliger, Lacey, Olney, Cox, and O’Neil (2010) as well as to that of Botwinick, Bisognano, and Hardaden (2006) who stated, “Only senior leaders can productively direct efforts in their healthcare organizations to foster the culture and commitment required to address the underlying systems causes of medical errors and harm to patients” (p. 1).

Although nursing executive leadership is a key component in directing quality improvement projects, Kliger et al. (2010) indicated that many nurse executives lack an understanding of critical project management skills. The researchers utilized a case study approach to compare and contrast three management philosophies designed to assist nurse executives to direct patient safety initiatives. The authors’ targeting of Chief Nursing Officers as the ultimate responsible party for implementing change is in contrast to the views of other authors such as Wurster (2007) who believes the unit manager (closer to the bedside) is the key leader in implementing change designed to improve patient outcomes. The role of nursing leadership in the successful implementation of
teamwork processes and improving the quality of patient care is a critical component of the current research.

In addition to the gap in leadership and practice, researchers indicate a serious gap also exists between nursing education, research, and practice. The Quality and Safety Education for Nurses (QSEN) program, a recent initiative sponsored by the Robert Wood Johnson Foundation, hopes to help close that gap. “The major goal of QSEN is to prepare future nurses with the knowledge, skills, and attitudes necessary to continuously improve the quality and safety of care delivery in health care systems” (Sullivan, 2010, p. 37). The QSEN Institute provides a comprehensive website (http://www.qsen.org/) based at the University of North Carolina at Chapel Hill. This site is an excellent source of scholarly information about nursing safety and quality. The purpose of QSEN is to improve the quality and safety of global healthcare systems by preparing professional nurses with the knowledge, skills, and attitudes needed to engage in activities designed to improve the healthcare environment and services. QSEN Institute was formed in 2005 with the vision of assisting nurses to develop the competencies “in patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics” (QSEN Institute, 2012, para. 2). Embedded within the website are numerous resources about teamwork and quality outcomes useful to this author’s current project. One page, entitled “Teamwork and Collaboration,” provides definitions, knowledge, skills, and attitudes associated with teamwork; a bibliography; as well as links to multiple research articles, tools, and resources related to teamwork and quality patient outcomes. The steering committee of the website consists of PhD faculty from nursing programs throughout the United States, providing excellent critical peer review
of all information placed on the website. The existence of this website reinforces the critical importance of the current teamwork and patient outcome project.

A recent article by Sullivan (2010) described the need to better connect nursing education and practice to improve quality and safety. The author provided important historical context for the nursing education-practice gap, summarized the critical gap, cited QSEN accomplishments, and made recommendations for the future. Sullivan described the migration of nursing education away from practice environments to academic settings, which has resulted in faculty who are less mindful of the evolving world of contemporary practice. Sullivan reported research data collected via surveying nursing educational programs, which documents gaps in the areas of quality improvement and informatics. This data, collected from nearly 600 nursing programs across the US, also provided insight into the inconsistencies in curricula between educational programs. The inclusion of the concept of the nursing education-practice gap is an important addition to the author’s research and helped frame the action-oriented design of the research.

The gap between education and practice was further described by Howard (2010) who studied the curricula of nursing educational programs looking for content related to patient safety and quality outcomes. Howard indicated that 10 years after the identification of the significant problem of human errors in the US healthcare system, 9 of the top 10 nursing schools in the US failed to require a dedicated patient safety component within their curricula. Following the identification of the top 10 nursing schools, as identified by US News and World Report, Howard reviewed curricula looking for specific terms such as patient safety or quality. Findings indicated that nursing
education has not embedded these important topics in the curricula. For example, “the top-ranked school was found to have two nursing specialty curriculum catalogs, totaling 174 course descriptions, entirely devoid of the words ‘safety,’ ‘quality,’ and ‘error’” (Howard, 2010, p. 1). The significance of the findings cannot be underestimated and is highly correlated to the current research. The lack of patient safety and the accompanying issues such as teamwork in the nursing educational programs contribute to the ongoing patient safety shortfalls.

A similar study by Clark (2011) examined the relationship between education and practice in Norway. Clark, like Sullivan (2010), investigated the relationship between practice and education. The promotion of teamwork in healthcare requires an understanding of the relationship between inter-professional practice (IPP) and inter-professional education (IPE). The mixed methods research study utilized both qualitative and quantitative methodology to examine healthcare teamwork in Norway. Clark’s focus was on interdisciplinary care rather than on nursing teams. Clark collected data via focus groups to assess the antecedents, barriers, and rewards of collaborative care in clinical settings. An online survey was used to measure attitudes, barriers, and facilitating factors among senior administrators in the educational system. The findings indicated that although providers reported positive rewards of collaborative practice, managers failed to support the value of IPP. In contrast, leaders in education expressed a great value in IPE, but failed to fully address barriers to implementation. The gap is similar to that described by Sullivan (2010) and QSEN Institute (2012) and will require leadership in both clinical and academic settings to focus on the need to incorporate teamwork education into undergraduate and on-site hospital employment settings.
Similarly, one study conducted by the University of Pennsylvania (Albanese et al., 2010) focused on the challenges of gathering, recording, and analyzing data used in performance improvement processes, and then successfully transferring that knowledge to practicing nurses at the patient bedside to implement process improvements. The authors represented nursing practice, nursing leadership (Hospital of the University of Pennsylvania), and nursing education (University of Pennsylvania), and provided a comprehensive case study view of the issue of improving quality of care and patient outcomes. Much like Sullivan (2010), the authors described a critical disconnect between researchers who conducted studies aimed at improving patient outcomes and the bedside practitioners who need to utilize the data to make changes at the patient level. Resolving the gap will require nursing leadership, education, and practice to work cooperatively toward the goal of engaging all nurses in quality initiatives. Including bedside practitioners in the research process will assist with the collaboration of research and practice. The article provided an excellent source of information from both the review of literature and the University of Pennsylvania case.

**Gaps in the Current Literature**

Although the list of resources on teamwork in general, inter-professional teamwork in healthcare, and nursing teamwork is far-reaching and extensive, a variety of gaps remain, several of which have already been identified in this review of literature. Although the impact of teamwork and collaboration on patient safety, patient outcomes, and quality of care is well documented in healthcare literature, the majority of research has focused on the critical nature of interdisciplinary communication and teamwork. Specifically, the study of nursing teams, rather than that of inter-professional healthcare
teams, is lacking. The definition of nursing unit teamwork, its design and effectiveness, has been only minimally researched. The exploration of unit-specific data rather than institutional data may provide useful for better understanding the working unit in which nurses perform their duties. In addition, the current teamwork literature focuses on specialty units rather than on the general medical-surgical nursing population.

In addition, the body of research on teamwork does not clearly identify differences between teamwork occurring within a particular shift as compared to the teamwork occurring between various shifts. The literature views the teamwork as a collective whole and does not clearly identify inter-shift teamwork constructs, issues, strategies, and solutions as compared to those of intra-shift teamwork. With the exception of research focusing on inter-shift handoff reporting, there is a void of information specifically targeting the 24-hour accountability of nursing teams and the concept of inter-shift teamwork. Specifically missing from the literature are the inter-shift teamwork concepts of shared common goals, inter-personal communication, the process of teamwork related to continuity of care between shifts, and the methodology for managing conflict between shifts.

Nursing literature, especially related to research, tends to focus solely on the role, interventions, and best practices of the professional nurse (RN), leaving a gap in the literature on the role of the unlicensed assistive personnel (UAP) working under the supervision of the RN. While the Registered Nurse is accountable for all patient care and outcomes, the role of the UAP as part of the nursing team is critical. It is the UAP who perform delegated tasks such as routine rounding and toileting to prevent patients for getting out of bed alone and falling, turning and re-positioning bedridden patients and
Inspecting skin during bathing to prevent pressure ulcers, and provision of catheter care during hygiene or properly transporting a patient with a catheter. While these tasks are routinely delegated to the UAP, understanding the impact of the UAP in the team, their perception of their role, and the provision of and need for education for the UAP in areas such as teamwork is lacking in the literature.

Summary

The literature regarding nursing teamwork and patient outcomes demonstrates four major components. First, research has demonstrated that preventable negative patient outcomes continue to pervade American healthcare. Second, literature in healthcare has demonstrated an overall relationship between teamwork and outcomes; however, the focus of research has been on interdisciplinary teamwork and teamwork occurring in healthcare specialty areas such as intensive care or obstetrics. Research in general medical-surgical units and research within the nursing team are limited. In addition, research related to a specific construct or a component of teamwork is limited, thus inhibiting the establishment of targeted educational and leadership interventions designed to alleviate the problem. The third component of the problem identified in the literature is a disconnect between nursing leadership, education, and practice regarding the role teamwork plays in each sector. Lastly, the limited research focusing on nursing teamwork in the medical-surgical areas prevents the incorporation of meaningful teamwork strategies until evidence clearly demonstrates a critical need for the transformation of nursing teamwork in education, leadership, and practice.

Researchers agree that additional studies regarding nursing teamwork are needed to more fully understand the relationship of teamwork to patient outcomes and the
potential implications for changes designed to improve the quality of patient care.

Closing the research gap related to nursing teamwork, implementing strategies to educate nurses regarding the critical impact of teamwork, and involving nursing leadership in the facilitation of teamwork signify several important avenues for potentially impacting the quality of patient care.
Chapter 3: Research Design and Methodology

Introduction

The non-experimental research of this study was designed to investigate the relationship between nursing teamwork within acute care medical-surgical nursing units and the occurrence of specific patient outcomes: patient falls, pressure ulcers, and urinary catheter-associated infections. The research project included a mixed methodology approach utilizing both quantitative and qualitative data collection and analysis. The non-experimental method provided a means to gather data regarding the relationship of nursing teamwork and patient outcomes while protecting human subjects, and maintaining a high standard of ethics. The use of a non-experimental design was selected due to the consideration that several variables of interest could not be manipulated (Lapan & Quartaroli, 2009). For example, in this situation, the purposeful manipulation of the quantity or quality of teamwork as an independent variable could potentially interfere with excellence in patient care and result in negative outcomes for the patient.

Research Design and Rationale

A mixed method research design was selected in order to collect, analyze, and “mix” both quantitative and qualitative data in the research process within the single study. Mixed methodology provided a more complete understanding of the research problem. It was determined that nursing teamwork is a complex phenomenon of human behavior, best studied by including both the quantitative and qualitative frameworks. The collection of quantitative data in this study utilized numeric and statistical processes to answer specific questions about the qualities of nursing teamwork and the relationship to
outcomes. The inclusion of a qualitative design provided the opportunity to secure experiential data from the participants, which could not be obtained by purely quantitative methodology. The mixed methodology research design was preferred to examine these complex processes, allowing for qualitative and quantitative data to be triangulated during the analysis phase with the goals of providing a more complete examination of the constructs and improved confirmation of the research findings. Creswell (2008) indicated that a mixed methodology design can “provide a better understanding of the research problem and questions than either method by itself” (p. 552). Quantitative and qualitative methods, when used in combination, complement each other and allow for more thorough understanding of the research problem (Creswell, 2008; Green, Caracelli, & Graham, 1989; Leech & Onwuegbuzie, 2009; Tashakkori & Teddlie, 1998).

Leech and Onwuegbuzie (2009) described three dimensions of mixed methodology research: (a) level, (b) timing, and (c) emphasis on the quantitative and qualitative research paradigms. The first dimension described was that of full versus partial mixed methodology, describing the level of “mixing” in the process. When utilizing a full mixed methodology approach, the quantitative and qualitative research data are intertwined within a single stage of the research process. In partial mixed methodology, the two designs are not mixed in one stage.

The second dimension described by Leech and Onwuegbuzie (2009) defined the timing of the research processes as either concurrent or sequential. Concurrent mixed methods research collects both the quantitative and qualitative research together, whereas a sequential process describes the process used when the researcher first completes one
phase of research, then completes the other form sequentially. In a sequential process, it is only during the data analysis and interpretation phase of the research that the quantitative and qualitative data are mixed to provide a more complete understanding of the phenomena being studied. Creswell (2008) further described the two-phase mixed-methodology model as a process that “first collects quantitative data, and then subsequently collects qualitative data to help explain or elaborate on the quantitative results” (Creswell, 2008, p. 560).

The final descriptor of mixed methodology research concerns that of emphasis, describing whether one form of research has a more substantial role in the research process (Leech & Onwuegbuzie, 2009). The methodology chosen may be (a) equal, (b) more heavily weighted toward quantitative research, or (c) more substantially driven by the qualitative methodology.

Similarly, Creswell, Plano, Clark, Guttman, and Hanson (2003) described mixed methodology research as having the dimensions of priority, implementation, and integration. In this description, the term priority referred to whether the emphasis was on either the quantitative or qualitative methodology, implementation referred to the timing of the quantitative and qualitative data collection (sequential or concurrent), and integration referred to the phase in the research process in which the mixing or connecting of the quantitative and qualitative data occurs.

With this understanding of the dimensions of mixed methodology, the design of this research on teamwork and patient outcomes was described as partially mixed, sequential, with an emphasis on quantitative methodology. This design also mirrored one of the most frequently used mixed-methods approaches in educational research as
described by Creswell (2008) who termed this research methodology an explanatory mixed methods design (Creswell, 2008). The specifics of each sector of the research design is further explained in the data collection section.

There were three primary rationales for utilizing a mixed methodology approach to answer the research questions in this study. First, the purpose of utilizing a mixed methods approach was to provide the opportunity to implement the research methodology that best addressed the research questions. The mixed methods approach closely aligned with the research study in that nursing teamwork is both a quantifiable and qualitative issue. The compatibility thesis hypothesized that quantitative and qualitative methods are both compatible and complementary and, when employed in a single research study, provide valuable insight not typically available in a mono-designed study (Cherryholmes, 1992). The mixed methodology approach provided opportunity to triangulate data to answer the research questions. A table depicting each research question and the corresponding methodology is provided in Appendix C.

The second rationale for use of mixed methodology deals with a philosophy of pragmatism. The overall research theme of teamwork and patient outcomes is a real-world phenomenon in the world of healthcare. The philosophy of pragmatism encourages researchers to utilize the approaches most closely resembling the real world being studied. A mixed methodology approach offered the best opportunities for viewing the real world of nursing teamwork in a holistic manner.

The final rationale for utilizing a mixed methods approach was to strengthen the research findings. Triangulation was utilized to analyze the multiple data points and included both quantitative and qualitative data in the final results. Methodological
triangulation or mixed-methods triangulation provided cross-validation to assure the investigator that the data were a result of the trait being studied rather than of the methodology (Jick, 1979; Thurmond, 2001). The goal of utilizing mixed methodology was to provide multiple points of data with complementary strengths and non-overlapping weaknesses. Methodological triangulation of data improved both the completeness and confirmation of the data, as described by Casey and Murphy (2009). By drawing on multiple viewpoints, confidence was improved that the research provided accurate and credible sources of information and conclusions. A more complete discussion of both the methodology and data triangulation is available in the following sections.

**Site and Population**

**Population Description**

The target population included in this research was that of nursing team members currently employed in acute care medical-surgical environments in the United States. The nursing teams throughout the United States consist of individuals serving in a variety of roles including Registered Nurses (RN) and Licensed Practical Nurses (LPN) and unlicensed personnel such as nursing assistants and unit secretaries (unit clerks) who provide important supportive services under the direction of the Registered Nurses. A Nurse Manager, who is also licensed as a RN, typically serves in a direct leadership role for each nursing team.

Both Registered Nurses and Licensed Practical Nurses are individuals who have completed state-approved programs of study, are legally approved by a state Board of Nursing, and have demonstrated entry-level competency by passing a national
examination called the National Council Licensure Examination specific to each nursing license (Licensed Practical Nurses, 2009; Registered Nurses, 2009). Following successful completion of the NCLEX-RN examination, an individual may use the credentials of “RN.” Following successful completion of a practical nursing program and passing the NCLEX-PN examination, an individual may use the respective credentials of “LPN.” Although the licensing examinations are nationally standardized examinations, RNs and LPNs are licensed to practice in individual states and must also receive state approval or endorsement from a State Board of Nursing to practice in each particular state (Licensed Practical Nurses, 2009; Registered Nurses, 2009).

The nursing team also consists of important Unlicensed Assistive Personnel (UAP) who provide supportive roles and work under the direction of the RN. UAP include nursing assistants and unit secretaries. Nursing assistants, sometimes also known as aides or patient care assistants, are individuals who provide basic care needs such as hygiene, nutrition, or ambulation according to the patient’s plan of care. Unit secretaries or clerks assist the team by providing secretarial and coordinating skills and are often responsible for timely communication between physicians, nurses, the healthcare team, patients, and the patient’s family or significant others. Patient outcomes rely heavily on the collaboration of both the licensed and unlicensed caregivers.

Nursing teams work in a variety of settings and specialty areas. The role of an “acute care medical-surgical unit” provided additional inclusion limits to the population described in this study. The term “acute care” refers to healthcare environments within a hospital serving adult populations with short-term illnesses and disorders, and excludes environments such as obstetrics (women and baby), pediatrics (children),
psychiatry/mental health, rehabilitation, long-term care (nursing home), or outpatient settings. Medical and surgical nursing teams, the inclusion criteria of this study, describe two broad categories of adult health specialties capturing the large majority of care provided in an acute healthcare setting.

Medical care is provided to assist individuals with a wide variety of conditions such as diabetes, hypertension, or pneumonia, which can be treated with medications or treatments other than surgery. Surgical care is provided to patients who have disorders requiring invasive operations (surgery) for treatment of the condition, such as gallbladder disease, many solid tumor cancers, or hernias. In effort to maintain homogeneity of the research units, high acuity units such as intensive care, emergency care, or progressive step down units were not included in the study. Thus, the target population described in this study included nursing teams composed primarily of men and women employed as RNs and LPNs and in supportive roles who worked in medical-surgical units within acute care hospitals in the United States of America.

**Research sample.** The research utilized a non-probability convenience sample, garnering participants from medical-surgical nursing environments within a single acute care institution in the United States described in detail below. Non-probability convenience sampling was described by Creswell (2008) as the use of study participants “because they are willing and available to be studied” (p. 155). This form of sampling provides valuable information but limits the generalizability of the research results.

The convenience sample focused on participants from a single 735-bed acute care community health system located in northeastern United States. Participation was limited to nursing staff working on units designated by the hospital and NDNQI as medical units,
surgical units, or combination medical-surgical units. The sample population of nursing team members working in the acute care medical-surgical environments was further defined by the licensing, role, and location of employment. Thus, the unit of investigation was a single nursing team composed primarily of Registered Nurses (RN), nursing assistants, and unit secretaries who work together on one medical-surgical nursing unit.

Eight units met the NDNQI designation of medical, surgical, or combined medical-surgical units within the research site, with approximately 350 qualified team members available to participate in the teamwork survey. All full-time and part-time nursing staff employed on the medical-surgical units were invited to participate in the research process. Nursing staff members working on any shift (day, evening, night, or a combination of shifts) within the designated units were invited to participate. Due to the goal of the research as well as to staff perception of potential for coercion, bias, and hindrances to reliability of collected data, Nurse Managers were excluded from participation in focus groups and surveys.

Site Description

The site of the study was a not-for-profit community hospital in the northeast region of the United States. The institution provides comprehensive acute care, post-acute rehabilitation, behavioral, and occupational health services, and has a long-standing history in the community. The institution was identified as a leader in tertiary care for the region. The research site was the largest employer in the local region employing approximately 7,000 men and women in both clinical and support services. The clinical site was licensed by the state’s Department of Health and accredited by The Joint
Commission, an independent not-for-profit organization that accredits healthcare agencies who meet national standards of quality and excellence.

**Site access.** Initial inquiries to the research site regarding this study were positive. Access to the sample of nursing teams and patient care data was secured through the Chief Nursing Officer (CNO) and Vice President of Patient Care Services. In addition, the institution’s research protocols required that additional individuals be informed in advance of the data collection including the Nurse Managers, Division Directors, Nursing Research Council, Director of Nursing Research, Research Advisory Council (RAC), and the Institutional Review Board (IRB). Through this information sharing process, the institution expressed an interest in participating in this study and viewed the potential findings as beneficial to future decisions regarding improving teamwork and impacting patient outcomes.

Access to nursing teams in their work environment is often a challenge due to the nature of the work and the difficulty nurses and UAP have in leaving their patient care duties to participate in an activity such as focus group interviews. To address this potential concern, the focus group interviews were conducted either immediately before or after shift start or end times, or at times requested by the staff, thus allowing participation without the tension of interference with patient care. In addition, the surveys were provided in an electronic computer-generated format permitting participants the opportunity to provide confidential data at a time convenient to them without interfering with their work schedule.
Research Methods

Introduction to Methods

The mixed methods approach included multiple data collection methods. The list of data collection methodologies employed in this study included: (a) teamwork survey (quantitative), (b) collection of pre-existing NDNQI patient outcome data (quantitative), and (c) follow-up focus group interviews (qualitative). Each methodology is explained in detail in the following sections.

Description of Methods Used

Quantitative data methodology. The quantitative data were collected using an established survey tool entitled the Nursing Teamwork Survey (NTS). The investigator secured written permission from the author of the NTS to utilize the survey tool in this research study. This 33-item 5-point Likert-type scale tool, designed to be a self-administered survey, was developed and tested by Kalisch et al. (2010). Validity and reliability testing by Kalisch et al. (2010) demonstrated psychometric properties including factor analysis and subscale development, concurrent validity, contrast and convergent validities, test-retest reliability, and internal consistency. The 33-item NTS was used verbatim from the original source, thus preserving the established validity and reliability of the survey. The demographic section preceding the NTS was slightly modified from its original format to collect additional information pertinent to the current population and research questions. A copy of the entire instrument (demographics and NTS) is available in Appendix D. The psychometric testing of the Nursing Teamwork Survey provided evidence of valid and reliable psychometric properties. Kalisch et al. (2010) provided the psychometric properties of the NTS, which are described further.
Content validity was established by a panel of experts. Concurrent validity showed a significant correlation between teamwork scores and an imbedded question related to overall satisfaction with teamwork ($r = .633, p < .001$). The exploratory factor analysis on a random half of the sample predicted a 33-item 5-factor solution, whereas the confirmatory factor analysis on the remaining half of the sample confirmed the factor structure (comparative fit index = .884, root mean square error of approximation = .055, standardized root mean square residual = .045). Contrast validity showed that staff in a non-inpatient unit did not answer the questions in the same way ($r_{WG(J)} = .25$) as the inpatient unit staff ($r_{WG(J)} > .90$). Convergent validity of the teamwork tool was measured by correlating the Teamwork subscale of the Safety Attitudes Questionnaire with the NTS ($r = .76, p < .01$). The NTS had good test-retest reliability ($r = .92$ for overall 33 items; $r = .77$ to .87 for the five subscales) and internal consistency (alpha = .94 for overall items; alpha = .74 to .85 for the subscales). Aggregation of individual-level responses to the unit level was supported by intra-class correlation coefficient $1 = .16 (p < .001)$, intra-class correlation coefficient $2 = .9 (p < .001)$, and mean $r_{WG(J)} = .98$. (p. 42)

The validity and reliability of the NTS were tested by administering the survey to 1,758 inpatient acute care nursing staff members in one academic healthcare setting and one community hospital. The sample used for the original tests of validity and reliability included nursing staff from adult ICU, pediatric ICU, adult intermediate units, rehabilitation, pediatric, maternity, and emergency department and transport teams. According to data published by Kalisch et al. (2010), the majority of respondents in this initial validity testing of the survey were non-medical-surgical unit nursing staff members. The sample in the present research was uniquely limited to a subset of acute care medical-surgical nursing teams in a different environment than originally tested. Use of the tool in a purely medical-surgical environment provided a different set of data points in a new population.

**Quantitative participant selection.** The selection of medical-surgical units within the institution was described previously and was based upon the type of patient, acuity of illness, and primary diagnoses treated on each nursing unit. The goal utilizing only
NDNQI-defined medical, surgical, and medical-surgical units was to provide homogeneity of groups in the analysis of the data.

The researcher personally approached all Nurse Managers and Division Directors of the participating units and obtained approval for their nursing team to participate in the study. The Nurse Managers and Division Directors were informed that identity of the participants and the teamwork data collected from their respective units would not be shared with the managers/directors in any form for the purpose of maintaining strict confidentiality of all participants.

**Quantitative identification and invitation.** Nursing staff in the identified medical-surgical units were contacted by individualized written e-mail messages explaining the research project. Institutionally issued e-mail addresses were utilized for all participants. Prior to survey distribution, each participant was identified according to the nursing unit on which they were employed. Each unit’s data were collected as a separate survey database to maintain anonymity of the participant, yet provide accurate correlation to the unit’s NDNQI outcome data. The surveys were delivered electronically using Survey Tracker® software.

An informed consent letter accompanied the survey. The informed consent information provided the participants with a written summary about the research including: (a) purpose of research, (b) time involved, (c) assessment of minimal risk, (d) statement regarding benefit to participants, (e) researcher’s contact information for questions about the research, and (f) a contact for questions about rights as a research participant. The informed consent letter included a statement indicating that the
completion and return of the survey provided implied consent to participate in the research.

Motivation for nursing staff members to participate in the research was expected to be a barrier to participation. Several motivational strategies to increase participation were utilized. Champion participants were identified for each unit. The role of the champion was to provide reminders to staff regarding participation. Reminders took the form of a printed poster to hang in the staff locker room showing the percentage of participation thus far or a quick announcement in staff huddles. In addition, utilizing Dillman’s (2000) Tailored Design Methods, several reminders were provided to the invitees designed to increase participation rates. The multi-step process of reminders included:

- initial e-mail sent with Survey Tracker\textsuperscript{®} link to take survey
- week two – thank you/reminder e-postcard to all participants
- weeks three and four–resend e-mail with Survey Tracker\textsuperscript{®} link to all potential participants.

One additional incentive to participate was an opportunity for each survey participant to be included in a drawing for a $100 gift card. To maintain anonymity, each participant who completed the survey had the opportunity to submit a secret self-selected codename, which was placed in a drawing for a gift card (see instructions on survey in Appendix D). Three gift cards were awarded to survey participants. A fourth gift card was provided as an incentive to participate in the focus groups.

**Quantitative data collection.** The nursing teamwork data were collected utilizing the NTS. Completed surveys were designed to be returned to the researcher either
electronically or by paper/pencil if the participant preferred. No requests for paper/pencil format were received. The electronic survey data were stored in a password protected electronic file and the raw data will be retained ad infinitum. A completion time of one month was provided for return of the surveys. Several reminders to complete the survey were provided, and the most current survey participation levels were provided in reminders for the 4-week period of data collection.

The second form of quantitative data collection pertained to the unit-specific NDNQI data. The aggregated NTS data collected from the teamwork survey were correlated to most recent quarters of NDNQI patient outcome data for the same nursing unit. The research site had designated NDNQI site coordinators who were responsible for the proper and accurate collection of the quarterly data via the hospital’s information, quality, risk management, and staffing/scheduling systems. NDNQI site coordinators were required to collect data in strict accordance with NDNQI guidelines. The use of NDNQI data provided unit-based aggregate patient outcome data, collected in a systematic manner, protecting the privacy rights of individual patients and easily correlated with unit-based teamwork data.

NDNQI data were measured on a per “1,000 patient day” scale meaning each patient was counted once per day in the quarter. For example, if a unit census was 20 patients per day for three full months (90 days), that would equate to 20 times 90 or 1,800 patient days. The number of falls (or other outcome measures) occurring during that time frame was calculated and reported per 1,000 patient days. If, for example, 15 patient falls occurred over the course of the 1,800 patient days, the resulting numeric value reported by NDNQI for that nursing unit was 15/1,800 multiplied by 1,000 = 8.33. This provided
a standardized reporting methodology regardless of unit size or changing patient census. The institution’s NDNQI data were not protected by NDNQI in any confidential manner and could be released as part of the study report (with the permission of the institution, which was secured in the IRB process). NDNQI national benchmarking data were permitted to be utilized in statistical formulas; however, the national NDNQI data were determined to be proprietary and could not be published without written consent from NDNQI (D. Hertzog, personal communication, September 27, 2011). A sample format of NDNQI institutional outcome data is included in Table 2.

Table 2

Sample Outcome Data

<table>
<thead>
<tr>
<th>Pressure Ulcer Data</th>
<th>1st Qtr 2014</th>
<th>2nd Qtr 2014</th>
<th>3rd Qtr 2014</th>
<th>4th Qtr 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT A</td>
<td>5.34</td>
<td>2.65</td>
<td>3.58</td>
<td>2.88</td>
</tr>
<tr>
<td>UNIT B</td>
<td>3.57</td>
<td>4.76</td>
<td>4.35</td>
<td>0.00</td>
</tr>
<tr>
<td>UNIT C</td>
<td>9.09</td>
<td>8.33</td>
<td>0.00</td>
<td>7.69</td>
</tr>
</tbody>
</table>

Quantitative data analysis procedures. Returned NTS surveys were sorted according to the nursing unit. Aggregated unit-specific NTS data were compiled by the researcher. Survey response data were analyzed first using the Survey Tracker® software package, which provided numeric tallies and descriptive statistics for each NTS item. To preserve sample size, the researcher structured the survey to require answers to all NTS questions, thus avoiding missing data. The initial statistical analysis included measures
of central tendency and dispersion. In addition, the data were assessed to determine if the variables were normally distributed.

Final analysis of NTS and NDNQI data was completed using Statistical Packages for the Social Science (SPSS) Windows version 20. The quantitative research analysis utilized correlation of data to examine relationships of variables. The intent of utilizing a correlation design was to build upon previous research by Kalisch and Lee (2009) and discover a prediction, degree, and direction of the relationship between nursing teamwork and patient outcomes.

The teamwork survey data were first aggregated per nursing team or unit in two primary methods. Following the sorting of responses by unit, an overall teamwork score was calculated. This overall teamwork score provided an average score for all respondents and all questions from one particular team or unit. This broad mean score provided a cursory view of the overall performance on the teamwork survey for each team of nurses and UAP. Throughout the data analysis, this score was labeled as the team’s “overall teamwork score.”

The complex nature of nursing care and patient outcomes lends itself to utilizing statistical formulas that take into account how each of the five constructs of teamwork, individually and in combination, explain the relationship of patient outcomes. Thus, in addition to the overall teamwork score, each unit’s aggregated survey data were calculated to provide a mean score for each of the five constructs measured by the NTS. These mean scores provided a measure for the team’s performance in the constructs of Backup Behaviors, Shared Mental Model, Team Leadership, Team Orientation, and Trust.
Multiple statistical formulas, including bivariate correlational statistics, provided analysis of the quantitative data to answer the quantitative research sub-questions and determine the association and relationship between the independent teamwork and dependent outcome variables. This step assessed the relationship of each independent teamwork variable, one at a time, with a single dependent outcome variable by calculating the correlation coefficient. Each of the five constructs and the overall teamwork score were analyzed to identify any associations between each one of the team constructs and each patient outcome (pressure ulcers, falls, and catheter-associated infections).

Correlations measure is a statistical technique analyzing how variables or rank orders are related. In addition, correlation determines how strongly the pairs of variables are related. The results of a statistical correlation test range from -1 to +1, with the sign telling the direction of the relationship. A negative (minus) finding indicates that the relationship between the two variables is inverse, meaning as one variable increases, the other variable decreases. A positive (plus) finding indicates that the relationship between the two variables is direct, meaning as one variable increases, the other variable also increases. As results move closer to +1 or -1, the strength of the relationship increases. A relationship of zero indicates no correlation between the variables.

To begin the correlational analysis, a separate table was created for each of the dependent variables (total falls, injury falls, UAPU, UAPU greater than stage II, and CAUTI). Each table contained the unit data for teamwork scores in the left columns and the corresponding unit outcome data (dependent variable) in the right columns. The outcome data were analyzed for the most recent quarter of the year (2013 quarter four),
which corresponded to the timing of the teamwork survey. In addition, the most recent six quarters (18 months) of data were also analyzed. A sample table for the outcome of falls is provided in Table 3, demonstrating the independent and dependent variables for a single dependent variable (falls). This table related only to falls; similar tables were created for each of the remaining patient outcomes.

Table 3

Sample Table for Independent and Dependent Variables per Nursing Unit (Total Falls)

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependent Variables (Total Falls)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Survey Mean</td>
</tr>
<tr>
<td>UNIT 1</td>
<td>3.43</td>
</tr>
<tr>
<td>UNIT 2</td>
<td>3.72</td>
</tr>
<tr>
<td>UNIT 3</td>
<td>3.48</td>
</tr>
<tr>
<td>UNIT 4</td>
<td>3.53</td>
</tr>
<tr>
<td>UNIT 5</td>
<td>3.43</td>
</tr>
<tr>
<td>UNIT 6</td>
<td>3.04</td>
</tr>
<tr>
<td>UNIT 7</td>
<td>3.28</td>
</tr>
<tr>
<td>UNIT 8</td>
<td>3.72</td>
</tr>
</tbody>
</table>

Using the previously mentioned datasets, Kendall’s Tau-b correlation coefficients were computed to assess the relationship between the overall teamwork score and each of the dependent variables of falls, falls with injury, UAPU, UAPU greater than stage II, and CAUTI. In addition, Kendall’s Tau-b correlation coefficients were computed to assess the relationship between each of the five teamwork constructs and each of the dependent
variables. The Kendall’s Tau-b analysis was chosen due to the non-normal distribution and lack of evidence of a linear relationship between the variables. Kendall’s Tau-b is an intuitively simple measure of strength of relationship between X and Y variables.

Kendall’s Tau-b is a nonparametric measure of association based on the number of concordances and discordances in paired observations. Kendall’s Tau-b is achieved by first ranking the data. The data are double sorted by ranking observations according to values of the first variable and re-ranking the observations according to values of the second variable. The paired data are determined to be concordant if the data fall in the same order with respect to each variable. The paired data are determined to be discordant if the paired data are in the reverse ordering for X and Y or the values are arranged in opposite directions. The Kendall’s Tau-b calculations (as opposed to Tau-a) allows for tied pairs (pairs of observations with equal values of X or equal values of Y). Kendall’s Tau-b does not permit squaring of the correlation to get a coefficient of determination.

Analysis of this information permitted the investigator to either accept or reject the null hypothesis. Correlational research does not infer causation and the researcher maintained caution in the interpretation of the research results. In addition, Creswell (2008) suggested the researcher should use the findings to determine if the current research confirmed the findings from previously conducted research. The correlation analysis assisted the researcher in explaining the practical implications of the findings related to nursing practice, education, and leadership.

**Qualitative data methodology.** Focus group interviews were conducted with the purpose of clarifying, amplifying, and verifying the datasets to provide a more complete and thorough analysis of the variables. The focus groups were conducted following
quantitative data analysis and aimed at gathering information regarding the participants’ overall lived experiences regarding teamwork. A second purpose of the focus groups was to clarify any questions arising from the quantitative data collected in the NTS. As described by Leech and Onwuegbuzie (2009), the focus group interviews followed the quantitative data analysis to provide for the collection of qualitative explanatory data related to the initial quantitative findings.

**Qualitative instrument description.** Focus groups were conducted following the collection and initial analysis of the quantitative data. Three focus groups were conducted, one following the completion of each of the three shifts (night shift, day shift, and evening shift), thus encouraging participants from all three shifts to attend. Light refreshments were provided to focus group participants.

The methodology for collection of the qualitative data included semi-structured open-ended focus group interviews to establish the lived experience of nurses and UAP working in a team environment. The focus groups were designed to identify themes related to teamwork; leadership’s role in teamwork; and the participants’ personal definitions, beliefs, and attitudes associated with nursing teamwork. The focus groups consisted of a combination of participants from all contributing nursing units. Semi-structured interviews with pre-scripted questions relating to the research questions formed the foundation for the focus group interviews. Appendix E provides a list of the questions and topics used in the focus group sessions, and cites the connection of the focus group questions to the qualitative research sub-questions.

**Qualitative participant selection.** The goal of the focus groups was to gain insight regarding teamwork from a diverse group of nursing team members representing
both licensed and unlicensed personnel working all three shifts on the medical-surgical units. Therefore, a form of purposive sampling called non-proportional sampling was planned. The primary criterion for participation in the focus group interviews was that of a nursing team member from the previously identified medical-surgical nursing units. Inclusion and exclusion factors remained consistent with the quantitative portion of the study. The non-proportional sampling was designed to enhance the understandings of the selected groups’ experiences. The goal was to include those individuals who could provide the greatest insight into the research question from a variety of perspectives.

The established plan was to conduct focus groups composed of six to eight selected nursing staff members currently working in an acute care medical-surgical environment in the research site. A diverse mix of team roles was included to assist with gathering data from all subsets of the population including nursing assistants/patient care assistants, unit secretaries, and Registered Nurses (RN). Members were encouraged to be participatory and reflective.

Ethical issues related to participant selection and protection were addressed in accordance with the guidance provided by Hewson, Yule, Laurent, and Vogel (as cited in Merriam, 2009). These ethical issues included the assurance of adult status of participant, informed consent, ensuring confidentiality and security of information, and the provision of debriefing following the interview to permit questions and assure the interviewer that the participant incurred no harm.

**Qualitative identification and invitation.** The researcher obtained a list of individuals employed on each of the selected nursing units. Participants for focus groups were invited by e-mail. Individuals were invited to self-select the focus group that best
fit their schedule. The e-mail invitation explained the purpose of the upcoming focus groups and the importance of the invited participant’s input. The date and time of the three focus groups was provided with an e-mail requesting RSVP. The purpose of the RSVP was to notify the researcher of the number of willing participants for each session and the participant’s selection criteria. Each person responding to the researcher was asked to complete a grid answering questions related to the participant’s role (RN, LPN, Nursing Assistant, Unit Secretary, or other), unit, shift, and which focus group they wanted to attend. The researcher filled the three focus groups as replies were received. A confirmation message was sent to each participant. A friendly e-mail reminder was also sent both one week and one day before the focus group session.

**Qualitative data collection.** Creswell (2007) discussed the advantages of using a “natural setting” approach to data collection in qualitative research. Use of the natural setting provided the data were collected within the typical setting of the participants, allowing for face-to-face interactions and collection of realistic data. Thus, the focus group interview sites were planned within the acute care hospital setting.

All focus group sessions were designed to last one hour. The sessions were held immediately after shifts to permit the largest number of participants. Sessions were scheduled in private conference rooms with comfortable seating around a conference table, adequate lighting, and airflow. All focus group members had visibility of the interviewer and each other. Simple refreshments were provided.

The focus group interviews opened with introductions, followed by an explanation of the research study, purpose of focus groups, completion of written consent of participants, review of agenda, ground rules, interview questions with feedback,
questions from group participants, debriefing, and wrap-up. The researcher obtained written informed consent (see Appendix F) from each participant prior to beginning the focus group interview. The researcher communicated that each individual’s participation was important and critical to the research project. Confidentiality of the information was explained, and each participant also signed an agreement of confidentiality.

The participants were informed that an audio recording was being made at the time of the interview and that a verbatim transcription of the discussion would follow the interview. The participants were notified at the exact time the recording device was turned on and when the recording was stopped at the end of the interview. The researcher informed participants that the audio recordings would be stored securely for up to five years and would then be destroyed. In addition, participants were informed that the transcripts of the focus groups would be retained ad infinitum in electronic form in a password protected file to which only the researcher had access. The researcher explained to participants that the researcher was planning to take notes throughout the interview to provide self-reminders for follow-up questions. Notes were shredded following the completion of the focus group. A research assistant was present to record non-verbal cues from participants for additional triangulation of data. Participants were introduced to the research assistant prior to beginning the focus groups. Participants were informed that the research assistant would be recording notes throughout the interview.

A semi-structured interview process as described by Merriam (2009) was conducted, allowing for additional questions based on the participants’ responses. A debriefing session was provided following the conclusion of the interview to elicit any questions from the participants and reaffirm that the process caused no undue stress or
negative consequences for the interviewees. A personal thank you was provided to each person who participated in a focus group session.

**Qualitative data analysis.** A thematic analysis approach to narrative inquiry was planned to preserve the content of the text, focus on the verbatim transcription of the interview, and judiciously categorize the data into meaningful components. Thematic data analysis was conducted in an effort to identify themes that adequately reflected the focus group data. Thematic analysis is a system of categorizing qualitative data with the goal of moving from a broad reading of the data to the discovery of themes and patterns. The focus groups’ collections of stories and narrations related to teamwork provided the opportunity for conceptual grouping of ideas and inductive coding of the concepts.

Thematic analysis is a broad term used by a variety of qualitative theorists. Merriam (2009) described qualitative data analysis as a series of stages including the identification of a central core category related to various other categories, identification of properties that define the categories, and the development of relationships identified in the data. Boyatzis (1998) characterized thematic analysis as a tool rather than a specific methodology to be used in qualitative research. The typology of themes and inductive coding was also described by Creswell’s (2007) description of qualitative data analysis.

The method utilized for thematic analysis of the qualitative data in this project followed a six-stage process as identified by Braun and Clarke (2006). The six stages were: (a) becoming familiar with the data, (b) generating initial codes, (c) searching for themes, (d) reviewing themes, (e) defining and naming themes, and (f) producing the report. Braun and Clarke’s (2006) six-stage process requires active involvement of the researcher, rather than simply a belief that themes reside in the data themselves and
“emerge” in a passive manner. The systematic data analysis process was designed to organize the data and provide deep and detailed descriptions of the data.

Prior to beginning the actual coding process, Braun and Clarke (2006) indicated the researcher must first answer a number of important questions to help guide the process. The first question involved the researcher’s vision of what constitutes a theme and the size or amount of data required to identify a theme. Braun and Clarke (2006) indicated the most repeated sets of data do not necessarily represent the most important themes, stating, “A theme captures something important about the data in relation to the research question, and represents some level of patterned response of meaning within the data set” (p. 87). Ideally, a pattern of occurrences will be spread across the dataset; however, qualitative research analysis does not utilize a quantifiable measure to indicate that more data equate with greater significance. The researcher utilized experiential and cognitive judgment to determine the significance of a set of data as it relates directly to the research questions.

The second area of discussion involved the distinction between inductive versus theoretical thematic analysis. Researchers have indicated that themes can be identified in two manners. The first approach is a data-driven approach called inductive analysis. An inductive approach indicates the themes are strongly linked to the collected data rather than to any previously identified theoretical framework (Braun & Clarke, 2006). Inductive coding is conducted in a manner that identifies themes directly from the data without attempting to fit the data into prior research or already established theories. In contrast, theoretical thematic analysis is driven by the pre-determined theoretical framework (Braun & Clarke, 2006). Both inductive and thematic analyses were
considered by the researcher. However, due to the lack of depth in prior studies of the medical-surgical nursing population, it was the intent of this researcher to enter the research process void of pre-conceived teamwork theories and utilize an inductive coding approach to identify themes in the studied sample. Research findings were later compared to established theoretical frameworks during the analysis phase.

The third criterion established prior to the commencement of the coding process related to the level of understanding used for the identification of the themes. This process can take two forms: semantic or latent. A semantic or explicit level of identification occurs at the level of the actual spoken word of participants during an interview. The surface meaning of the data is used for thematic identification, without diving deeper into the meaning or interpretation of the spoken word. It is only after coding occurs, during analysis, that the researcher identifies patterns and theorizes the interpretation of the data. By comparison, latent theme identification utilizes interpretation and identifies “underlying issues, assumptions, and conceptualizations – and ideologies – that are theorized as shaping or informing the semantic content of the data” (Braun & Clarke, 2006, p. 4). The intent for the current research project is to utilize the semantic level of thematic identification, employing the actual pure data collected from participants to identify the themes associated with the research questions. The purpose of the inclusion of the qualitative process in this study is to provide completeness and confirmation of quantitative data. Thus, the utilization of a semantic approach, without researcher interpretation of meaning, will provide a more direct unbiased triangulation with the quantitative survey data.
The process of thematic analysis required an extensive dive into the data. The following phases of analysis were used as guides to the process; however, the actual analysis process was a fluid recursive process, which did not necessarily follow the linear step-by-step phases described below.

**Phase one – Familiarizing self with the data.** Qualitative analysis began with the data collection phase. Following the recorded focus group interviews, the researcher created a verbatim transcription of the discussions to begin the analysis of the data. The transcriptions were compared word-for-word to the actual audio recordings for accuracy. Transcripts were provided to participants for member checking verification. Becoming familiar with the data required immersion through repeated reading of the verbatim transcripts and careful note taking of thoughts and ideas that surfaced during the readings. Braun and Clarke (2006) indicated that this early phase of familiarization with the data is a critical stage for successful data analysis and suggested a minimum of one complete active read-through of the transcripts before initiating coding.

**Phase two – Coding methodology.** Following transcription and the researcher’s initial familiarization with the data, a systematic coding of the data was conducted using an open-coding approach (Creswell, 2007). The coding of the data was performed using the track changes option of Microsoft Office Word 2010 to note the codes in the transcription margins. Line numbers were assigned for identifiers and cross-referencing.

The researcher carefully read the transcripts utilizing an inductive approach to allow themes to emerge from the data. During this initial coding process, the researcher identified major issues to acquire a sense of overarching topics in the data. Codes were used to identify a feature of the data that appeared of interest to the researcher. Codes
organized the data into meaningful concepts. A systematic approach was utilized to code as many constructs as possible. A second and third reading of the data were performed, done meticulously line-by-line with the researcher annotating any new information or topics in the coding margins.

The transcript and topical codes were then reviewed several additional times to condense the descriptors into common codes with acronyms. Each descriptive code was marked using track changes until the entire transcript was coded. During this process, emerging themes started to be identified.

**Phase three – Identification of themes.** Following the complete coding of all data, the researcher began searching for themes or common threads in the codes. “A theme captures something important about the data in relation to the research question and represents some level of patterned response or meaning within the data set” (Braun & Clarke, 2006, p. 82). The long list of codes were sorted, analyzed, and collated into themes or broader concepts. A thematic table was utilized to sort the codes into major themes and sub-themes. This phase was completed when a set of potential themes was identified and the original transcribed data were sorted and recorded under each thematic heading. In this initial theme stage, no data, codes, or themes were disregarded.

**Phase four – Reviewing themes.** The refinement of initial themes occurred in this stage. Patton’s (1990) criteria for judging themes included both internal homogeneity and external heterogeneity. Assessment of internal homogeneity indicated that data submersed within each theme was bound together by some commonality. In contrast, external heterogeneity referred to the distinct separation of data between themes. Analyzing the themes in terms of internal homogeneity and external heterogeneity
resulted in the merging of similar homogenous themes. Some data needed to be re-sorted, or removed and recoded, until the emerging themes and coded data formed a comprehensive conceptual map. This first level of thematic review was considered to be complete when all data were properly coded within a theme and the data coded under each theme was complete and comprehensible.

This phase was followed by a complete read-through of the original dataset in its entirety to compare the identified themes with the data as a whole. In addition, now that themes had been established, reading the dataset identified additional data needing to be coded under the identified themes as described by Braun and Clarke (2006). Some researchers have identified this process as axial coding, which involves re-contextualization whereby all data are now considered in terms of the identified themes. Each theme was viewed in isolation and the original data were reconsidered according to each theme. This was a vital stage in the analytic process (Braun & Clarke, 2006).

**Phase five – Defining and naming themes.** After the thorough re-examination and axial coding of the text and themes, the final stage of thematic construction was conducted. This refinement and analysis of the themes required the researcher to write a detailed analysis of each theme. The eventual themes were analyzed in relation to the initial research question and qualitative sub-questions. In addition, the relationships of themes to each other were also acknowledged. This phase therefore resulted in distinct and identifiable themes, with clearly labeled titles and distinguishable definitions of the inter-relationships between the themes. Each theme was finalized, named, described, and illustrated by utilizing a few quotations from the original text to help communicate the meaning of the theme to the reader (Braun & Clarke, 2006).
Phase six – Producing the report. Braun and Clarke (2006) reported that this stage is not truly part of the data analysis section, but rather is the next step after analysis is completed. The analysis of the data is provided in report form in Chapter 4.

Trustworthiness of qualitative data. Providing trustworthiness of the qualitative research processes required the researcher to perform each stage in a rigorous manner (Ryan, n.d.). Active involvement of the researcher was required at all stages of the process. The aforementioned processes of qualitative data collection and analysis maximized the potential to identify the full range of the phenomenon of nursing teamwork in a medical-surgical setting. The collection techniques were designed to generate the level of detail needed to respond to the research questions.

Similar to validity and reliability in quantitative measures, trustworthiness in qualitative research provides reassurance that the findings are credible. Several measures were employed to achieve trustworthiness of the data. Transcripts of the focus group interviews were double-checked for accuracy. A codebook was developed to describe each code. The codebook contained a definition and example for each of the codes. The codebook and focus group transcripts were shared with three doctoral prepared nurses during a conference in summer 2014 to assist with coding and provide a measure of inter-rater reliability.

Construct validity, as defined by Creswell (2008), is the degree to which qualitative data analysis forms inferences from the connection of observations and qualitative data to the known constructs. To establish construct validity, inferences were drawn between the qualitative teamwork data and the theoretical structure of teamwork. In addition, the qualitative data were analyzed for the level of correspondence with
current reality in nursing practice. Concurrent validity exists when qualitative data supports the quantitative data (Creswell, 2008).

**Triangulation of data.** Methodological triangulation of data was employed in multiple forms with the rationale, process, and rigor described below. An across-methods sequential process provided a general description of the operationalization of the triangulation process (Casey & Murphy, 2009). Across-methods methodological triangulation was described by Denzin (1989) as a common process in mixed methods research in which two different forms of data, qualitative and quantitative, are utilized in a single research design. Denzin (1989) provided a contrasting view to within-methods triangulation, which occurs when two like methods, such as two forms of qualitative research, are utilized within a single study designed to measure the same variable. Triangulation can also be categorized as sequential or simultaneous. Similar to the previous description of the methodology, the triangulation in this study was a sequential process, with the quantitative data analysis performed in advance of the qualitative analysis.

The triangulation of data provided two major strengths to the research as described by Jick (1979). Those two strengths were confirmation of data and completeness of data (Jick, 1979). Confirmation of data was the process of utilizing two or more forms of data to explore the same construct, providing increased confidence in the findings (Denzin, 1989). Thus, the use of quantitative and qualitative processes enhanced the validity of the study. Jick (1979) provided a second rationale for triangulation, indicating that viewing data from different perspectives assists the researcher in providing a more complete or holistic view of the research problem.
Creswell (2008) further explained that triangulation of data provides a means to design a study with complementary strengths and non-overlapping of weaknesses of the various methodologies. For example, the qualitative portion of the study was constructed to include a small sample size (weakness), but with the goal of achieving data saturation, providing a comprehensive collection of detailed descriptive data. The quantitative survey portion of the study included a larger population (strength) but was limited by the closed-ended survey questions and finite Likert-type scale responses.

Creswell (2008) described the explanatory design of triangulation as a two-stage process in which the qualitative data assist in the explanation of the quantitative data. Appendix C provides a table that is the foundation for the creation of a triangulation matrix, presenting both the quantitative and qualitative methodologies chosen to explore each research question. The researcher created a matrix, which proved to be quite helpful in analyzing the data and triangulating the findings. Quantitative survey data and findings were first analyzed in relation to the research questions. Then, the qualitative focus group data were sorted according to the identified codes and themes, and the data were also entered into the matrix under the corresponding research question. The verbal responses secured during focus groups were compared and contrasted to the survey data, thus triangulating the qualitative and quantitative data. The researcher utilized direct quotes from the focus groups to compare, contrast, validate, and embellish the quantitative survey findings. In addition, observations made during the focus groups, including non-verbal expressions, were compared to verbalizations and explanatory data.
Stages of Data Collection

The study design provided for statistical data to be collected separately according to individual nursing units, thus creating parallel groups for comparison. Designing the study in this manner linked a specific unit’s teamwork survey data with their own patient outcome data, thus providing the framework of the correlational study. The researcher analyzed the data looking for the presence of relationships between a single nursing unit’s teamwork data and the NDNQI patient outcome data for that same nursing unit as compared to the other unit data.

The data collection followed three major stages, each described in detail in the following sections. First, quantitative teamwork data were collected using an established survey entitled the Nursing Teamwork Survey (NTS), which is described in more detail below, and a copy of which can be found in Appendix D. The second stage of the research process utilized the most recently collected NDNQI outcome data. Each unit’s NTS data served as the independent variable and the most recent NDNQI outcome data served as the dependent variables. The teamwork survey data for each unit was compared to each of the three NDNQI outcomes separately (falls, pressure ulcers, and urinary catheter associated infections) using a correlational statistical methodology. The third and final data collection phase was the qualitative phase when the researcher conducted focus groups for the purpose of clarifying and amplifying the quantitative data. In addition, this qualitative process collected general informative data regarding nursing staff’s education and experiences related to teamwork. This final data collection stage was followed by comprehensive triangulated analysis. Each separate phase of the
research is described in more detail in the following sections. A diagram of the stages of data collection is provided in Figure 4.

![Figure 4. Research methodology: Explanatory mixed methods design.](image)

The seven stages represented in the first line of the diagram and the timeline for each of the data collection and analysis stages is summarized in Table 4.

<table>
<thead>
<tr>
<th>PHASE</th>
<th>DESCRIPTION</th>
<th>TIMELINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Collection of Quantitative Survey Data using Nursing Teamwork Survey (NTS)</td>
<td>October/November</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2013</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Initial quantitative data analysis (Teamwork survey descriptive analysis)</td>
<td></td>
</tr>
<tr>
<td>PHASE</td>
<td>DESCRIPTION</td>
<td>TIMELINE</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Collection of Quantitative NDNQI patient outcome data when 2013 Quarter 4 data are available and published</td>
<td>February 2014</td>
</tr>
<tr>
<td>Phase 4</td>
<td>Quantitative data analysis (analysis of teamwork survey and NDNQI data)</td>
<td>February/April 2014</td>
</tr>
<tr>
<td>Phase 5</td>
<td>Conduct Qualitative Focus Groups. Analyze focus group data.</td>
<td>February/March 2014</td>
</tr>
<tr>
<td>Phase 6</td>
<td>Final data analysis (triangulation of quantitative and qualitative data). Analysis and triangulation of quantitative and qualitative data.</td>
<td>May/July 2014</td>
</tr>
<tr>
<td>Phase 7</td>
<td>Practical application and implementation of action research findings. Writing and dissemination of findings.</td>
<td>Fall 2014</td>
</tr>
</tbody>
</table>

**Ethical Considerations**

The protection of participants’ rights was a critical factor taken into consideration in the research design. Strategies for assurance of ethical standards focused on securing informed consent, protecting the participant’s right to withdraw, protecting anonymity of survey participants, confidentiality, and conducting the study with integrity and the avoidance of deceptive practices (Creswell, 2008). The researcher completed the Collaborative Institutional Training Initiative (CITI) curriculum for Social, Behavioral and Educational Research Investigators in February 2011 with subsequent renewal in 2014. The risk to patients through the use of the NDNQI outcome data was non-existent. Patient contact and individual patient data were not be utilized in the research study. The
methodology employed the use of NDNQI aggregated data, which is completely de-identified and posed no threat to patient confidentiality or breach of health information privacy laws (HIPAA). Absolutely no identifiable Protected Health Information (PHI) was collected throughout the research process. The design of the research had no impact on direct patient care and thus, patient approval was not required.

The research methodology utilized nursing staff surveys and focus group interviews to gather data regarding teamwork within a nursing unit. The only identifier critical to the research was the identity of which nursing unit the individual survey respondent worked. This identifier was required to properly associate the unit teamwork survey data with the unit NDNQI data. Surveys were distributed in batches according to unit designations, thus eliminating the need for participants to identify their unit of work. As previously described, when surveys were returned, they were already separated into correct units. Individual participant identifiers such as participant names were not collected or recorded. All potentially identifiable demographic data, such as job position (e.g., RN versus nurse aid), collected during the survey were accessible only to the researcher and stored by the researcher in locked files. All quantitative data for one nursing unit are aggregated and reported as “unit data” (not in terms of individuals). Further, the results of the study have been reported without any identification of which nursing units responded favorably or unfavorably in terms of the responses to teamwork on their particular unit, thus completely protecting the anonymity and confidentiality of participants. Focus group data were reported in aggregate form only to support the findings of the quantitative data.
Voluntary participation required that participants were not coerced into involvement (Creswell, 2008). The issue of coercion was an important consideration in action-oriented research where the research took place in the site at which the researcher was employed. It was important to recognize that participants were potentially vulnerable to a sense of coercion by virtue of their relationship with the researcher or by the researcher’s position within the institution. The informed consent process was developed and conducted in a manner to meet the needs of the participants giving consideration to possible power relationships and the perceived risk of coercion. Obtaining the informed consent addressed this issue and helped ensure that people were not deceived or coerced into participating in the research. In addition, the invitation to participate included the reassurance that there were no repercussions for choosing to not participate. The returned surveys were not personally identifiable. Data were recorded in aggregate form only.

Closely related to voluntary participation is the ethical principle of informed consent. The informed consent process in this study included a thorough explanation of the identified risks and benefits of participation as well as information explaining the participant’s right to withdraw consent. Each nursing staff survey participant was provided a thorough explanation of the research process prior to providing consent. Risks to survey participation were minimal to non-existent given the nature of the research process. It was remotely possible that participants could suffer financial or emotional harm in extreme circumstances if their individual responses to sensitive questions became public knowledge. For example, if a subject described various concerns in the practices of their nursing unit, and if that information was somehow
tracked to their identity, then the slight potential exists for retribution by managers or co-workers. This, however, was not expected. To avoid any possibility of this type of problem, the confidentiality of any subject’s survey responses were strictly maintained by the researcher.

One additional area of concern was the relative freedom or constraint participants could have felt when asked to provide information about their internal processes and teamwork. Anticipated concerns included getting participants to openly and sincerely discuss the aspects of their work relationships, especially during the focus group interviews. Participants might have been uncomfortable providing open honest information about the strengths and weaknesses of their internal processes.

The confidentiality issue as related to focus group interviews offered additional challenges as the investigator could not be assured that confidentiality would be maintained by focus group participants (Smith, 1995). Statements of confidentiality were required of all focus group participants. Participants in the focus groups received the information regarding risks and provided an informed consent prior to participating. Data recorded from focus groups did not include any personal identifiers. Focus group data were reported in aggregate form only.

**Institutional Review Board approvals.** Protection of human subjects and assurance of patient safety were critical factors requiring permissions be secured both from the researcher’s university and the participating hospital’s Institutional Review Boards (IRBs). The rationale for securing IRB approval was related to assurances that the rights and welfare of the human subjects were adequately protected.
The participating institutions required a series of approvals prior to seeking IRB approval. The proposal was first presented to the Institution’s Nursing Research Council (NRC). This is a recommendation of all research conducted in the institution’s nursing department. Following NRC presentation and discussion, it is a requirement of the institution to present the proposal to the institution’s Research Advisory Council (RAC). The institution states that the Research Advisory Council’s purpose is to provide informal guidance to members of the institution’s community who wish to participate in investigator-initiated research and to formally review all investigator-initiated research proposals prior to Institutional Review Board (IRB) review. The RAC provided the institution’s IRB with an opinion regarding the scientific merit of the proposal (methodology). The final site approval was that of the IRB, which served primarily to protect human subjects involved in the research design.

IRB approvals were secured from both Drexel University and the research site. The Office for Human Research Protections made an allowance for the Institutional Review Board of one institution to act on behalf of the relying institution’s IRB via an IRB Authorization Agreement. The Drexel University IRB referred to this Authorization Agreement as a “Letter of Reliance.” The intent of the agreement was to help minimize or reduce the burdens of reviews and the redundancy in workload when two or more institutions act together on the same protocol. This process provided that only one IRB was determined to be the “IRB of record.” Thus, in this study, the Drexel University IRB suggested that the “IRB of Record” would be that of the research site with Drexel’s IRB designated as secondary.
Summary

The importance of the relationship of nursing teamwork to patient outcomes is vital to the future of the nursing profession, the United States healthcare system, and, most importantly, the patients served. In this project, teamwork data acquired by the use of the Nursing Teamwork Survey were correlated to NDNQI nurse-sensitive patient outcome data. The non-experimental mixed methods exploratory research design of this study follows accepted quantitative and qualitative investigative processes and was intended to expand current knowledge and provide a foundation for the exploration of sustainable strategies to foster change in the area of nursing teamwork and the subsequent influence on patient quality outcomes.
Chapter 4: Findings Results and Interpretations

The results and data analysis of the research study are presented in this chapter, which is organized in two overarching sections corresponding to the mixed methods approach utilized in the research process. Data are organized to address the primary research question of this study: How does nursing teamwork affect nurse-sensitive patient outcomes? In addition, the research sub-questions add depth, specificity, and organization to the investigation. The analysis of the quantitative research is provided first, with the analysis of qualitative data following in the second major section of the chapter. Each larger section is further divided into several sub-sections to describe the pertinent data analysis related to the research sub-questions. Following the separate analysis of quantitative and qualitative data, the triangulation of data identifies nine key findings.

The first (quantitative) section of the chapter provides a brief summary description of the item completion rates, response rates, and a summary of the demographic characteristics of the survey participants. The next subsection summarizes the relevant quantitative data and provides statistical analysis based on the original research question and hypothesis, inclusive of the analysis of nursing teamwork data and NDNQI nursing outcome data. In addition, the four quantitative sub-questions are discussed individually to provide more specific direction to answering the primary research question.

Chapter 4 continues with a section on qualitative data analysis designed to answer the same primary research question and qualitative sub-questions. Qualitative modes of
data analysis provide additional ways of examining and interpreting meaningful patterns or themes related to the research question, thus providing analysis of the research question from multiple angles.

Investigation of the concept from more than one perspective and the triangulation of data from both the quantitative and qualitative perspectives provide additional validation of data and serve to support a more thorough analysis of the complex phenomenon of nursing teamwork. In addition, the triangulation of data from multiple data points results in some identifiable inconsistencies. The inconsistencies as described by Patton (2002) are not interpreted as weaknesses of the data, but rather serve to provide an avenue for discovery of a deeper meaning in the data and future investigative questions of interest.

Findings

General Demographic and Survey Data

Incomplete or missing data. The completed surveys contained no missing NTS data. The electronic survey design required a response to each item before proceeding to the next item. One single demographic data point was missing on one respondent’s survey. That survey lacked an entry to the demographic question regarding the role of the respondent. However, the supplied educational data by that respondent indicated that this team member’s highest level of education was high school, thus permitting the coding of the survey into a non-RN (unlicensed) role.

Response rate. Three hundred fifty-five potential survey participants received invitations to participate in the study. A total of 155 surveys were returned; however, one survey was eliminated because the respondent indicated they were in a leadership
position at the time of survey completion. Thus, the 154 qualified survey responses represented an overall response rate of 43.38%. Using the formula \( E = \frac{1.96}{2\sqrt{154}} \), the margin of error in this sample size is calculated to be 7.90% at a 95% confidence interval. Individual unit response rates are included in Table 5 and range from 36.73% to 64.58%.

Table 5

Survey Response Rates per Nursing Unit

<table>
<thead>
<tr>
<th>Unit</th>
<th>Sent</th>
<th>Received</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT 1</td>
<td>49</td>
<td>18</td>
<td>36.73</td>
</tr>
<tr>
<td>UNIT 2</td>
<td>48</td>
<td>31</td>
<td>64.58</td>
</tr>
<tr>
<td>UNIT 3</td>
<td>60</td>
<td>23</td>
<td>38.33</td>
</tr>
<tr>
<td>UNIT 4</td>
<td>37</td>
<td>16</td>
<td>43.24</td>
</tr>
<tr>
<td>UNIT 5</td>
<td>40</td>
<td>17</td>
<td>42.5</td>
</tr>
<tr>
<td>UNIT 6</td>
<td>54</td>
<td>21</td>
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</tr>
<tr>
<td>UNIT 7</td>
<td>41</td>
<td>16</td>
<td>39.02</td>
</tr>
<tr>
<td>UNIT 8</td>
<td>26</td>
<td>12</td>
<td>46.15</td>
</tr>
</tbody>
</table>

Analysis of non-response bias. The purpose of performing non-response analysis was to discover characteristics that may differ between those individuals who responded to the survey and those who did not participate (non-respondents). A potential for bias exists if the respondents and non-respondents differ in some fashion. The most effective method of analysis would require that non-respondents participate in a data collection process, such as a survey or focus group, and reply to questions as to the reasons for not participating in the study. However, due to the anonymity of the
respondents, accurately identifying and contacting non-respondents was not feasible. In addition, given their lack of participation in the initial inquiry, it was improbable that those individuals who chose to be non-participants would respond to further inquiries.

A less precise, but acceptable method of assessing non-response bias was to compare early responders and late responders to the survey. Lindner, Murphy, and Briers (2001) provided a process for analyzing non-respondents by comparing the timeframe of those individuals who responded to the survey. The authors suggested that late responders are similar to the non-respondents. Therefore, by using the late responders group as a surrogate for the non-responder group, researchers deduct if any non-responder bias exists.

The date and time each survey was returned electronically were coded along with the survey data. The first half of the collected surveys, according to date and time of receipt, were coded as early responders and the last half of the collected surveys, according to date and time, were coded as late responders. An independent t test was performed using the mean values for the early and later responders’ answers to all 33 questions in the NTS. The analysis illustrated that 32 of the 33 questions demonstrated no significant difference at the .05 level of significance between early and late respondents. Only question 11, “Some team members spend extra time on breaks” was determined to demonstrate a significant difference between the early and late responders (p < .05). Given that only 1 of the 33 items provided any evidence of significant differences between early and late responders, the analysis does not identify a noteworthy difference between early and late responders implying that the addition of non-responder data would not appreciably impact overall data analysis and results.
Validity and reliability. The validity and reliability of the Nursing Teamwork Survey was initially established and reported by Kalisch et al. (2010) as previously reported in Chapter 3. Additional analysis of validity and an assessment of internal validity were conducted related to the current population and sample.

Tests of validity focused on two major types of validity including content and construct validity. The first type of validity testing was that of content analysis. Content validity focuses on the content of the measurement tool, assessing whether the data retrieved by use of the survey is congruent to the content domain of nursing teamwork. Two processes were used to confirm content validity in the current research setting and population. The first was an inter-rater expert review of the NTS and the second was a pilot study of the project. The inter-rater expert review was conducted by a panel of nine graduate-prepared Registered Nurses working at the research site, but not on the units utilized in the sampling process. The panel was asked to evaluate the NTS instrument and rate each of the 33 items’ relevance to the area of nursing teamwork using a 4-point Likert-type scale of 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, and 4 = very relevant. The Average Congruency Percentage (Popham, 1978) was calculated by averaging each rater’s percentage of congruent items together. Waltz, Strickland, and Lenz, (2005) indicated that an acceptable ACP will fall within the range of 90% or higher. The result for the NTS survey was calculated in the acceptable range at 97%.

In addition, a Content Validity Index (CVI) was obtained as described by Wynd, Schmidt, and Schaefer (2003). Content Validity index describes the proportion of agreement between independent raters. The Likert-type scale scores provided by the raters were compressed into a binary code of relevant or not relevant ratings whereby a
rating of 1 and 2 was considered “content invalid,” and ratings of 3 and 4 were considered to be “content valid” (Lynn, 1986; Waltz & Bausell, 1983; Waltz, Strickland, & Lenz, 1991). The Content Validity Index (CVI) was calculated by counting the number of items that received a rating of 3 or 4 by the experts and was determined to be 96.56%, representing adequate reliability.

The researcher conducted a pilot study in August 2013 as a means to test validity and the proposed research processes. The pilot study was designed as a small-scale study of feasibility (Polit & Beck, 2006). The purpose of the pilot study was to identify the strengths and limitations of the current study. The goals of the pilot study were to determine the acceptability of the survey in the current research site and population. In addition, the pilot study was conducted to test the quantitative survey data collection process to determine if the electronic survey process as designed was practical, achievable, and produced the desirable unit-based teamwork data to be utilized in the unit-based outcome correlations.

Two medical-surgical step down units were included in the pilot study survey sample. These two units were chosen because they would not be part of the final survey sample, yet they have characteristics and traits similar to those of the medical-surgical units in the final research population. The survey tool included the 33-item NTS, along with a demographic profile and four original questions related to satisfaction regarding inter-shift teamwork, intra-shift teamwork, and formal and continuing education. Participants were also asked to provide information regarding the length of time required to complete the survey and whether any questions in the survey were confusing or difficult to answer.
A total of 19 participants returned the pilot study survey (21% return rate). Sixteen of the 19 survey participants (84%) indicated the survey was appropriate to the construct of teamwork on their unit and had no issues or concerns related to the content of any of the questions. Three respondents (16%) indicated an affirmative response to the question related to “Were any questions in this survey confusing or difficult to answer?” Given the responses of the pilot study participants, one demographic question was modified. Otherwise, the NTS content was believed to be a valid measurement of teamwork in the setting without any major modifications.

The final analysis for validity was that of construct validity. Exploratory and confirmatory factor analyses provide constructs. Factor analysis provided a methodology for analyzing the interrelationships among the individual survey questions. The relationships were then used to reduce the number of variables (factors). As previously described, the NTS measured five factors of teamwork. Kalisch et al. (2010) reported the factor analysis process at the time of the validation of the survey. A repeat factor analysis was conducted by this researcher to examine the nature of and relations among the 33 items and five teamwork constructs utilizing the responses from the current sample. The 33 questions relating to teamwork were factor analyzed using principal component analysis. Similar to the original analysis reported by Kalisch et al. (2010), this analysis yielded five factors explaining a total of 77.359% of the variance for the entire set of variables. The survey as a whole was assessed resulting in a single construct with an Eigan value greater than one. This represents a good finding, as it can be interpreted to mean the teamwork survey generally measured only one construct. Each construct was also analyzed with the same finding of a single construct with an Eigan
value greater than one found in each construct. Total variances for each construct ranged from 48.612 to 66.795. These results coincided with results reported by Kalisch et al. (2010) and further validate the five constructs originally identified by the Nursing Teamwork Survey.

Reliability refers to dependability of a set of measurements and refers to the probability that repeated measures will yield consistent results (Pallant, 2005). Cronbach’s alpha coefficient is a commonly used measure of internal consistency and was used to determine how closely the 33-question tool related as a whole. A Cronbach’s alpha result of .957 was determined from the current sample, providing additional evidence that the 33 items reliably measured the single underlying teamwork construct. In addition, a Cronbach’s alpha was conducted to further assess the reliability of the subscales with a resulting range from .692 (Team Leadership) to .865 (Team Orientation). A Cronbach’s Alpha internal consistency score ranges from 0 to 1, where the measurement .8 or higher indicates good reliability (Waltz et al., 2005). The factor analysis and reliability results are available in Tables G1-G10 in Appendix G.

The four original survey questions related to inter- and intra-shift teamwork, and educational experiences of the participants were also tested for validity and reliability. Utilizing the identical processes previously described, inter-rater reliability was conducted for these four questions and demonstrated a high degree of validity with an Average Congruency Percentage whereby 100% of participants believed the questions to be congruent and a Content Validity Index (CVI) of 100, indicating all evaluators rated the questions as a level of 3 or 4 (content valid). Cronbach’s alpha for the four original
questions in the survey related to education and inter- and intra-shift teamwork was .764, suggesting these items also have relatively high internal consistency.

**Demographic characteristics of the sample.** The sample of 154 nursing team members provided a variety of demographic data points including gender, age, role within the team, highest educational level, highest degree in nursing, hours worked per week, shifts worked, length of experience in current role, and length of experience working on their current nursing unit. The overwhelming majority of respondents (95.5%) identified as female, while 4.5% of respondents self-identified as male. Although the U.S. Census Bureau (2013) reported that the national average of males in nursing is 9.6% of all nurses, the lower percentage of male respondents completing this survey more closely corresponds to the ratio at the research site and that of the invited population.

The age distribution is represented in Figure 5 depicting that the largest portion of respondents were in the 25 to 34 age range (36.4%), with relatively equal distribution between the age categories of 35 to 44 (20.1%) and 45 to 54-year-olds (21.4%). The two lowest proportions of ages in the distribution were at the extremes with those under 26 years of age (13.6%) and 55 to 64 years old (8.4%) with no respondents over the age of 65.
The majority of nursing staff team members responding to the survey was Registered Nurses (n = 101 or 65.58%). Although three individuals responding to the survey were licensed by the state as Licensed Practical Nurses (LPN), due to recent changes eliminating the role of LPNs within the organization, there were no individuals working in the role of LPN in the acute medical-surgical units. These LPNs were working in nursing assistant positions and were included in the demographics as “unlicensed” or Unlicensed Assistive Personnel (UAP) because that is the role they were fulfilling at the time of the study. However, when comparisons using UAP and RN data were performed, the LPN data were extracted from the UAP data pool to avoid any miscalculations that might result from inclusion of this unique subset of participants. The UAPs responding to the survey included Nursing Assistant and Patient Care Assistants (PCA) (n = 44 or 28.57%), unit clerk/secretaries (n = 5 or 3.25%), and individuals cross-trained for both PCA and unit clerk (n = 4 or 2.6%). A total of 101 (65.58%) Registered...
Nurses completed the survey and a total of 53 (34.42%) unlicensed personnel participated as depicted in Figure 6.

Figure 6. Role of survey respondents – RN and non-licensed (Unlicensed Assistive Personnel)

The educational preparation of survey participants ranged from grade school (n = 1) to graduate degrees (n = 9). As depicted in Table 6, the majority of respondents (74.6%) completed some type of post-secondary education.
Table 6

Educational Preparation All Respondents

<table>
<thead>
<tr>
<th>Education</th>
<th>Count (n)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade School</td>
<td>1</td>
<td>0.6</td>
</tr>
<tr>
<td>High School Graduate or GED</td>
<td>38</td>
<td>24.7</td>
</tr>
<tr>
<td>Associate Degree Graduate</td>
<td>49</td>
<td>31.8</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>57</td>
<td>37.0</td>
</tr>
<tr>
<td>Graduate Degree</td>
<td>9</td>
<td>5.8</td>
</tr>
</tbody>
</table>

The highest educational preparation of the licensed Registered Nurses responding to the survey is depicted in Table 7, indicating that 32.4% of all respondents (n = 154) and 49.5% of the total RN pool (n = 101) were educated at the associate degree or RN diploma level. In addition, 30.5% of all respondents (n=154) and 46.5% of registered nurses (n = 101) held a bachelor’s degree as their highest educational preparation, and 2.6% of total respondents or 4% of responding RNs earned a graduate degree in nursing.

Table 7

Highest Degree Earned of Licensed Nursing Respondents

<table>
<thead>
<tr>
<th>Educational Level</th>
<th>Count (n)</th>
<th>Percent of total n=154</th>
<th>Percent of RN n = 101</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN Diploma</td>
<td>31</td>
<td>20.1</td>
<td>30.7</td>
</tr>
<tr>
<td>Associate Degree in Nursing (ADN)</td>
<td>19</td>
<td>12.3</td>
<td>18.8</td>
</tr>
<tr>
<td>Bachelor’s Degree in Nursing</td>
<td>39</td>
<td>25.3</td>
<td>38.6</td>
</tr>
<tr>
<td>Bachelor’s Degree other than Nursing</td>
<td>8</td>
<td>5.2</td>
<td>7.9</td>
</tr>
<tr>
<td>Master’s Degree (MSN) or higher in nursing</td>
<td>4</td>
<td>2.6</td>
<td>4.0</td>
</tr>
</tbody>
</table>
The survey responses indicated that the majority of respondents (78.6%) worked more than 30 hours per week while the remaining 21.4% worked less than 30 hours per week. All three shifts were represented in the sample with 48.1% of respondents working daytime hours, 13% working evening hours, 33.1% working night hours, and 5.8% rotating between two shifts. Eight- and 12-hour shifts were relatively equally represented (46.8% and 42.2%, respectively), with the remaining respondents indicating that their shift rotated between 8 and 12 hours or another combination of schedules.

Survey participants provided information regarding the length of time working in their current role as well as the length of time working on their current patient care unit. While the majority of respondents worked in their current role (RN, PCA, Unit Clerk) more than five years (52%), over 51.9% of participants worked fewer than three years on their current unit. The largest percentage of respondents indicated they worked more than one year but less than three years on their current nursing unit (see Figure 7). These data support prior research and represent an important finding regarding nursing teams in that although individuals within a nursing team may possess multiple years of experience within their role, the unit nursing team lacks member stability, and nursing teams are constantly changing due to transfers between units, attrition, and the hiring of new team members.
**Figure 7.** Participant time in current role and time in current unit.

**Preparation of data for quantitative analysis.** Eight questions in the survey were worded in “reverse format,” such as “some team members spend extra time on breaks.” For these eight questions, the “always” answer would be analyzed as the most undesirable for a team and the “never” response as the most desirable. These eight questions, identified in Table 8, were “reverse coded” prior to performing data analysis.
Table 8

**Reverse Coded Questions (Survey questions 5, 11, 13, 15, 16, 17, 22, and 26)**

<table>
<thead>
<tr>
<th>Respondent Rating</th>
<th>Numeric rating for questions in NTS</th>
<th>Numeric rating for reverse worded questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>25% of the time</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>50% of the time</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>75% of the time</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Always</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

**Determination of the normality of the data distribution.** The first quantitative analysis performed on the NTS data was to establish the distribution of the data and compare the data to that of a normal distribution. A histogram is provided in Figure 8 representing the range of the teamwork data.
Figure 8. Distribution of responses to NTS.

The midpoint response on the survey was a 3 on a 5-point scale. The overall mean for all 33 Nursing Teamwork Survey questions for the total 154 respondents was 3.46 on a scale of 1 to 5 (all 33 questions averaged together for the n of 154). Both the median and mode values were determined to be 4.0 on the 5-point scale, with a standard deviation of 1.052.

The skewness and kurtosis for each question was analyzed for the aggregate data using each individual survey question as one variable (n=154). A skew value of zero indicates the data are normally distributed and symmetrically dispersed around the mean. Some statistical resources indicate a variable is reasonably close to normal distribution if its skewness and (excess) kurtosis have values between –2.0 and +2.0. A few more conservative resources indicate that a variable is reasonably close to normal distribution
if its skewness and (excess) kurtosis have values between −1.0 and +1.0. One such classic resource is Bulmer (1979) who indicated that when skewness is less than −1 or greater than +1, the distribution is considered to be highly skewed. Findings between −1 and −½ or between +½ and +1 indicate moderate skewness, and skewness between −½ and +½ is considered to be approximately symmetrical. Using this method of analysis, with the conservative scale as described above by Bulmer (1979), 18 of the 33 NTS questions were considered to be moderately skewed, while the remaining 15 questions resemble a normal distribution with skew values between zero and +0.5.

Kurtosis refers to the height and peakness of the data, describing whether the data are arranged around the mean in a peak that is sharp and high or broad and short. The large majority of questions (23/33) have kurtosis findings of between zero and +0.5, with eight questions with a moderate finding of kurtosis between +0.5 and +1. Only two questions have a kurtosis level greater than one. If a more liberal definition of normality were used, such as based on ±2 for skew and kurtosis values, all questions would fall into the normal curve. Due to the mixed results for skewness and kurtosis, further examination for normality was conducted.

The Kolmogorov-Smirnov Test of Normality was performed in SPSS, version 20. The null hypothesis for the Kolmogorov-Smirnov Test of Normality states that the actual distribution of the variable is equal to the expected distribution. Using the aggregated teamwork data, the statistical significance associated with the Kolmogorov-Smirnov Test of Normality was < 0.001, which is less than the level of significance (0.01). Thus using this standard, although some individual questions are normally distributed, the null
hypothesis was rejected, and it was concluded that the teamwork data as a whole were not normally distributed.

**Quantitative Variables and Research Findings**

The primary research question of this study was “How does nursing teamwork affect nurse-sensitive patient outcomes?” The quantitative data aimed at answering this primary question are divided into four sections according to the four quantitative research sub-questions.

**Quantitative research Sub-question 1: What is the variability in teamwork constructs across medical-surgical nursing units?** As previously described, prior research by Kalisch et al. (2010) identified constructs measured by the Nursing Teamwork Survey. These measured constructs, previously defined, include Backup, Shared Mental Model, Team Leadership, Team Orientation, and Trust. The research question was designed to explore whether a variability of teamwork function existed as related to these constructs specifically within medical-surgical nursing units. If a lack of variability in teamwork constructs existed, then any differences in outcomes across nursing units could not be associated with the level or quality of the teamwork. If the data demonstrated a variability of teamwork unit-to-unit, then the next step in the process would be to identify patterns of outcomes and investigate the relationship of the variability in teamwork-to-outcomes. Each of the eight nursing unit’s data were separated from the aggregate data and analyzed individually and in concert with each other. Each unit was assigned an arbitrary identifier such as “unit 1,” “unit 2,” and so forth. The unit identifier remained consistent throughout the analysis process.
The initial analysis consisted of the comparison of rank data, comparing the overall teamwork score and the sub-scores for each teamwork construct. The highest and lowest ranking teamwork construct sub-score for each unit is displayed in Table 9. Seven of eight units rated Team Orientation as the lowest construct for their nursing unit. Meanwhile, seven nursing units rated Shared Mental Model as the top ranking teamwork construct, with Team Leadership scoring as the only other construct receiving the highest ranking by the medical-surgical nursing units. Thus, the construct of Team Orientation consistently performs as the construct providing the greatest opportunity for improvement, for this particular sample, and was the weakest scoring construct in both the higher and lower performing teams. This finding demonstrates a consistent finding between units. This apparent lack of variability may have implications for nursing leadership and education regarding interventions targeted to improve this construct for all nursing units.

Table 9

<table>
<thead>
<tr>
<th>Nursing Unit</th>
<th>Highest Ranking Subscore per Unit</th>
<th>Lowest Ranking Subscore per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing Unit 1</td>
<td>Shared Mental Model</td>
<td>Team Orientation</td>
</tr>
<tr>
<td>Nursing Unit 2</td>
<td>Shared Mental Model</td>
<td>Team Orientation</td>
</tr>
<tr>
<td>Nursing Unit 3</td>
<td>Shared Mental Model</td>
<td>Team Orientation</td>
</tr>
<tr>
<td>Nursing Unit 4</td>
<td>Shared Mental Model</td>
<td>Team Orientation</td>
</tr>
<tr>
<td>Nursing Unit 5</td>
<td>Shared Mental Model</td>
<td>Team Orientation</td>
</tr>
<tr>
<td>Nursing Unit 6</td>
<td>Shared Mental Model and Team Leadership</td>
<td>Team Orientation</td>
</tr>
<tr>
<td>Nursing Unit 7</td>
<td>Team Leadership</td>
<td>Team Orientation</td>
</tr>
<tr>
<td>Nursing Unit 8</td>
<td>Shared Mental Model</td>
<td>Backup</td>
</tr>
</tbody>
</table>
Next, the mean score for the overall survey data and every construct was calculated per unit. Preliminary analysis of the unit data was simplified by using rank data. Table 10 provides the ranked data for each unit and each teamwork construct. The data do reflect some variability in teamwork from unit to unit.

Table 10

*Unit-to-Unit Comparison by Rank (per Construct)*

<table>
<thead>
<tr>
<th>Nursing Unit</th>
<th>Overall Survey</th>
<th>BU</th>
<th>SMM</th>
<th>TL</th>
<th>TO</th>
<th>TR</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT 1</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>UNIT 2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>UNIT 3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>UNIT 4</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>UNIT 5</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>UNIT 6</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>UNIT 7</td>
<td>7</td>
<td>2</td>
<td>7</td>
<td>3</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>UNIT 8</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Key: BU= backup; SMM= Shared Mental Model; TL = Team leadership; TO = Team Orientation; TR= Trust

The most noteworthy finding of this unit-ranked data is that of the extremes. While 5 of the 8 units had various rankings depending on the teamwork construct being examined, three of the units scored consistently as either the highest or lowest mean scores in all the constructs. Unit 6 scored as the lowest ranking nursing unit (8 out of 8) in the overall survey mean as well as for the teamwork constructs of Backup, Shared Mental Model, Team Leadership, and Trust. In addition, Unit 6 scored as seventh out of
the eight nursing units for the remaining construct of Team Orientation (the construct scoring lowest for the majority of units). Thus, Unit 6 with the lowest means in overall survey as well as 4 of the 5 constructs, descriptively appears to have the greatest variability and represents the lowest ranking unit compared to other units in regard to the teamwork scores.

Further analysis of the Unit 6 mean survey scores indicated that every score (overall and five sub-scores) scored lower than the aggregate mean data. Furthermore, Unit 6 was the only unit to score lower than the mean score in all construct areas, again implying that this unit’s teamwork data demonstrated a greater variability as compared to peer unit data.

On the other side of the data spectrum, two units appeared to score considerably higher in all aspects of the quantitative teamwork data. Both Unit 2 and Unit 8 scored higher than the mean in all five sub-scores and the overall teamwork score. Furthermore, these two units shared the number one and number two rankings in all categories. Both units scored the highest mean overall teamwork score of 3.72 (highest score). Unit 2 scored the highest mean score in three of the five sub-scores and Unit 8 scored the highest in the remaining two sub-scores as reflected in Table 11.
Table 11

*Unit Two and Unit Eight Top Rank Scores for Constructs*

<table>
<thead>
<tr>
<th></th>
<th>Survey Mean</th>
<th>BU</th>
<th>SMM</th>
<th>TL</th>
<th>TO</th>
<th>TR</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT 2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>UNIT 8</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Key: BU = backup; SMM = Shared Mental Model; TL = Team leadership; TO = Team Orientation; TR = Trust

*Unit-to-unit ANOVA.* To provide statistical analysis of the variability of teamwork across teams, an analysis of variance (ANOVA) was conducted. The purpose of the ANOVA was to distinguish differences and variability across units and examine whether a statistically significant variability existed between the survey data for the two high-achieving units and the lowest-achieving unit.

To begin this process, the data for all eight nursing units were re-examined for the assumptions associated with the ANOVA testing. Each unit’s data are considered to be independent with no overlapping of participants or data points. The Levene statistical test in SPSS 20 was used to analyze the variances of the overall survey mean as well as the means for each teamwork construct. The null hypothesis for the Levene Test of Homogeneity of Variances was that the variances of all mean scores in the sequence are essentially equal. A significant finding would indicate that the variances are not the same. The Levene Test of Homogeneity of Variances demonstrated that the null hypothesis should be retained, and the data did not demonstrate a statistically significant difference in the variances, thus meeting the assumption for the use of ANOVA. As previously described, the final assumption of normality presented more challenges.
However, the one-way ANOVA is generally considered a robust test against the normality assumption, meaning it endures violations of the normality assumption without impacting the Type I error rate (false positives).

Each teamwork construct was analyzed separately using ANOVA with Tukey HSD post-hoc tests to confirm where the differences occurred between groups. Several significant findings were discovered with the post-hoc tests indicating that statistically significant differences were found between Unit 2 and Unit 6.

An independent samples t test was conducted to compare leadership traits, as measured by the NTS, between Unit 2 and Unit 6. Four leadership questions from the NTS were analyzed. A significant difference was found in two of the leadership traits. The first significant difference in the scores for leadership deals with the issue of when changes in the workload occur during the shift (admissions, discharges, patient problems, etc.); a plan is made to deal with these changes. A significant difference, $t(50) = 3.189, p < .05$, exists with Unit 2 receiving higher leadership scores than Unit 6.

The second significant difference in the scores for leadership deals with the issue of nurses who serve as charge nurses, team leaders, or facilitators balancing workload within the team. There was a significant difference, $t(50) = 2.072, p < .05$, with Unit 2 receiving higher leadership scores than Unit 6.

The above stated unit-to-unit ANOVA results and leadership t-test results (see Table 12) supported the previously provided descriptive analysis, which demonstrated variability between Unit 2 and Unit 6. The AVOVA analysis confirmed that Unit 2 demonstrated significant differences in mean results for the Overall Teamwork Score as well as for the constructs of Shared Mental Model, Team Orientation, and Trust. This
analysis essentially indicated that Unit 2 demonstrates more consistent and greater teamwork behaviors as compared to Unit 6. Although Unit 8 also appeared to be a higher functioning team from a purely descriptive analysis, the ANOVA results did not find a significant difference between Unit 6 and Unit 8 Teamwork Survey results at $p < .05$.

Table 12

<table>
<thead>
<tr>
<th>What is the Variability in Teamwork Constructs Across Medical-Surgical Nursing Units?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Variability</td>
</tr>
<tr>
<td>Tukey HSD post-hoc</td>
</tr>
<tr>
<td>Overall Teamwork Score</td>
</tr>
<tr>
<td>Shared Mental Model</td>
</tr>
<tr>
<td>Team Orientation</td>
</tr>
<tr>
<td>Trust</td>
</tr>
</tbody>
</table>

Summary for research Sub-question 1: What is the variability of teamwork constructs across medical-surgical nursing units? Both the descriptive and statistical findings suggest variability between Unit 6’s and Unit 2’s performance on the teamwork survey and implies that differences and variability do exist in the levels of teamwork functioning among medical-surgical nursing units. The importance of identifying the variability of teamwork constructs across medical-surgical nursing units is twofold. First, this rank analysis of variability provided the first step in establishing a pattern regarding which teams appear to have a stronger teamwork framework in place to later compare outcomes and answer the primary research question. Second, the analysis and comparison of unit-to-unit teamwork variability may be beneficial in an action-oriented
research project, whereby the researcher may be able to make targeted
recommendations for education, leadership, or practice interventions based on the
specific findings of the individual nursing unit. Targeted strategies based on unit-specific
data, rather than on organization-wide programs may provide a more cost-effective and
efficient model of interventions to support teamwork process improvements. In addition,
the data support the important role of leadership in teamwork.

Quantitative research Sub-question 2: What patterns exist in medical-
surgical nursing teams when comparing teamwork constructs and patient
outcomes? This research question and the search for patterns relied on an analysis of the
variability of teamwork constructs in high- and low-performing teams and also on the
patient outcomes associated with the teams. The research proposal called for the
examination of several nursing-sensitive quality indicators, namely patient falls, pressure
ulcers, and catheter-associated urinary tract infections (CAUTI). The desired relationship
between NTS teamwork survey scores and NDNQI outcome data is a negative or inverse
relationship whereby as teamwork improves, the negative outcomes of falls, pressure
ulcers, and CAUTI decrease. To start this analysis, the most recent quarter NDNQI data
corresponding with the timing of the teamwork survey were examined. In addition to the
most recent quarter data, longitudinal data encompassing the past six quarters of outcome
results were also examined. All data were measured in a ratio of “per 1,000 patient days”
to achieve a comparable measurement unit-to-unit and account for differences in the
number of patients on any given unit throughout the data collection period.

Initially, due to the data collected and reported from the first research sub-
question related to variability of teamwork, the Unit 2 and Unit 6 data were examined in
isolation from other units to determine if any patterns existed. The Unit 2 team, with a statistically significant higher measurement on the NTS as described in the previous section, also outperformed the Unit 6 team in several categories of patient outcomes. Table 13 summarizes the outcome measurements for both units for the most recent quarter. Unit 2 had lower occurrences of negative patient outcomes in the categories of total falls, injury falls, unassisted falls, and catheter-associated urinary tract infections. The data indicate that neither unit reported any unit-acquired pressure ulcers occurring in the fourth quarter. Of interest is the comparison of findings related to categorizing falls as assisted versus unassisted. Assisted falls indicate that a staff member interceded in the fall and lowered the individuals to the floor, typically preventing substantial injury. Unassisted falls, the more serious occurrence, indicated that no staff member was able to lower the individual to the floor and the patient fell to the floor unaided. Unit 2 had outcome measurements of 2.77 total falls and 1.85 unassisted falls, indicating a difference of 0.92 assisted falls. However, Unit 6, which had more falls overall (2.79), also had zero assisted falls, meaning all falls occurred without staff intervention. The clinical significance of this finding is that not only were falls more frequent on Unit 6, but the potential for injury related to the greater number of unassisted falls is much higher for Unit 6 as compared to Unit 2. This analysis suggests a pattern existed whereby Unit 2, which scored with a significantly higher teamwork score in Overall Teamwork as well as in the constructs of Trust, Team Orientation, and Shared Mental Model, also had fewer raw data findings for negative patient outcomes of total falls, injury falls, unassisted falls, and catheter-associated urinary tract infections.
Table 13

Units Two and Six Outcome Data for Fourth Quarter of 2013

<table>
<thead>
<tr>
<th></th>
<th>Total Falls</th>
<th>Injury Falls</th>
<th>Unassisted Falls</th>
<th>UAPU</th>
<th>UAPU &gt;2</th>
<th>CAUTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2.77</td>
<td>0.46</td>
<td>1.85</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>2.79</td>
<td>0.47</td>
<td>2.79</td>
<td>0</td>
<td>0</td>
<td>2.78</td>
</tr>
</tbody>
</table>

Analysis of the past six quarters (18 months) of data reveals similar results when comparing Unit 2 and Unit 6 patient outcomes. As depicted in Figure 9, Unit 2 outperformed Unit 6 in fewer Total Falls, Injury Falls, and CAUTI over the six-quarter period. However, Unit 6 outperformed Unit 2 in UAPU occurring when Unit 2 had two consecutive quarters with an increase in pressure ulcers. During the other four quarters, Unit 2’s pressure ulcer results were zero.

![Figure 9](image)

*Figure 9.* Comparison of Unit 2 and Unit 6 NDNQI Outcomes over 18 months.
Unit 8 was the second unit identified as having all teamwork survey scores higher than the overall mean for the aggregate (n=154) in total teamwork score as well as for all five sub-scores (constructs). In addition, Unit 8’s most recent NDNQI outcome data for the corresponding fourth quarter of the year indicated the unit had zero cases of falls, pressure ulcers, and CAUTI. The clinical significance of Unit 8’s high performance in the teamwork survey and zero negative outcomes in a quarter is remarkable and cannot be understated.

Although the analysis of this initial raw data supported the premise that a pattern existed whereby teams with higher scores in the teamwork survey also demonstrated fewer negative patient outcomes, the statistical significance of these findings had not yet been established. Thus, an independent-samples t test was conducted to determine if these differences in outcome measurements was significant between Unit 2 and Unit 6. For this t-test analysis, the most recent six quarters of NDNQI outcome data were used. The results failed to demonstrate a statistical significance in any of the outcome measurements at the $p < .05$ level. These results suggest that the statistically significant difference in the level of teamwork as measured by the teamwork survey may correspond to a clinically significant lower number of negative outcomes, although statistical significance was not achieved.

**Summary for research Sub-question 2: What patterns exist in medical surgical nursing teams when comparing teamwork constructs and patient outcomes?** The raw data supported the premise that a pattern exists whereby medical-surgical nursing teams with higher levels of teamwork, as measured by the NTS, is accompanied by a pattern of fewer negative nursing outcomes. However, the identified pattern was not determined to
be statistically significant. Although the data suggest a contrast in Unit 6 and Unit 2 performance on the teamwork survey and implies differences in the level of teamwork functioning, the underlying causation for the differences cannot be established with this comparison data. Multiple confounding factors on both individual and unit bases may be impacting the validity of the data.

An assessment of the demographic data reveals two inconsistencies in demographics between Unit 2 and Unit 6. First, Unit 2, the higher performing team of the two, demonstrates a greater longevity of the sample team members. As depicted in Table 14, Unit 2 had six individuals who reported working on their current unit for greater than 6-10 years, and three individuals reported they worked on that unit for more than 10 years. In contrast, the Unit 6 sample had no individuals working longer than the greater than three-to-six-year category. It is important to note that this result represents the sample of participants and may not reflect the actual composition of the team overall.

Table 14

*Length of Time Working on Current Unit*

<table>
<thead>
<tr>
<th>UNIT</th>
<th>less than 1 year</th>
<th>&gt; 1 to 3 years</th>
<th>&gt; 3 to 6 years</th>
<th>&gt; 6 to 10 years</th>
<th>&gt; 10 years</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Count</td>
<td>3</td>
<td>15</td>
<td>4</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>9.7</td>
<td>48.4</td>
<td>12.9</td>
<td>19.4</td>
<td>9.7</td>
</tr>
<tr>
<td>6</td>
<td>Count</td>
<td>3</td>
<td>11</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>14.3</td>
<td>52.4</td>
<td>33.3</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
The second difference in demographic data between the higher performing Unit 2 and lower performing Unit 6 was the highest level of nursing education completed by the Registered Nurses. Fifty percent of the sample participants from Unit 2 had earned Bachelor’s degrees in nursing with an additional 13.64% earning a Bachelor’s degree outside of nursing for a total of 63.64% of the sample holding a Bachelor’s degree. In contrast, only 25% of the Unit 6 participants had earned Bachelor’s degrees of any type (see Table 15). Again, the data represent the sample of survey participants and may not reflect the actual composition of the team overall.

Table 15

*Comparison of Highest Level of Nursing Education for Units Two and Six*

<table>
<thead>
<tr>
<th>Unit Value</th>
<th>Count</th>
<th>Percent</th>
<th>Count</th>
<th>Percent</th>
<th>Count</th>
<th>Percent</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>0.0</td>
<td>8</td>
<td>36.37</td>
<td>11</td>
<td>50.0</td>
<td>3</td>
<td>13.64</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>100.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>43.75</td>
<td>5</td>
<td>31.25</td>
<td>4</td>
<td>25</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>100.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regardless, it is important to discuss the clinical impact and clinical significance of this raw data finding and it is highlighted in Chapter 5.

**Quantitative research Sub-question 3:** Which dimensions (constructs) of teamwork are associated with nurse-sensitive patient outcomes? The proposal for data analysis called for a correlational analysis between teamwork and patient outcomes
as described in the methodology section. The correlational data analysis between NTS teamwork constructs and patient outcomes produced one finding with significance. The Kendall’s Tau-b coefficient was computed to determine whether there was a relationship between the teamwork construct of Shared Mental Model and Unassisted Falls in quarter four. The test was conducted using an alpha of .05. The null hypothesis was that the relationship would be zero. The Kendall’s Tau-b correlation between Shared Mental Model and unassisted patient falls was -.571. The negative number indicated a reverse relationship meaning that as the teamwork construct of Shared Mental Modeling increased, the number of unassisted falls decreased. The finding was statistically different from zero ($\tau_b = - .571, n = 8, p = .048$) and indicated a moderate inverse relationship between the two variables. The relationship between Shared Mental Model and unassisted falls was the only finding with statistical significance related to the five constructs measured by the NTS and the three patient outcomes.

Additional statistical analysis was conducted to identify specific variables as described in each teamwork question. Analyzing each question as an independent variable provided more specific information regarding teamwork behaviors, which may impact outcomes. These relationships were computed utilizing both the Pearson Product-Moment Correlation Coefficient to determine if a relationship existed between the variables. Several findings were significant in all three types of negative patient outcomes and are reported in Table 16 using the Pearson $r$ value.
Table 16

**Correlation Coefficients for NTS Questions and Nursing Outcomes**

<table>
<thead>
<tr>
<th>Construct</th>
<th>NTS Independent Variable</th>
<th>Dependent Patient Outcome Variable</th>
<th>$r(8)$</th>
<th>$p$ (two tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMM</td>
<td>My team believes that to do a quality job, all of the members need to work together.</td>
<td>Unassisted Falls</td>
<td>-.771</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>TO</td>
<td>Most team members tend to avoid conflict rather than dealing with it.</td>
<td>UAPU &gt; STAGE II</td>
<td>-.732</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>TO</td>
<td>RN and Nursing Assistants work well together.</td>
<td>CAUTI</td>
<td>-.734</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>SMM</td>
<td>The shift change reports contain the information needed to care for the patients</td>
<td>CAUTI</td>
<td>-.854</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>BU</td>
<td>When the workload becomes extremely heavy, team members pitch in and work together to get the work done</td>
<td>CAUTI</td>
<td>-.889</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>TO</td>
<td>Team members are more focused on their own work than working together to achieve the total work of the team (reverse coded)</td>
<td>CAUTI</td>
<td>-.776</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>BU</td>
<td>Within our team, members are able to keep an eye out for each other without falling behind in our own individual work</td>
<td>CAUTI</td>
<td>-.746</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>SMM</td>
<td>Team members understand the role and responsibilities of each other</td>
<td>CAUTI</td>
<td>-.876</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>BU</td>
<td>Team members willingly respond to patients other than their own when other team members are busy or overloaded</td>
<td>CAUTI</td>
<td>-.794</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>TR</td>
<td>Team members value, seek and give each other constructive feedback</td>
<td>CAUTI</td>
<td>-.725</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>TR</td>
<td>When someone does not report to work or someone is pulled to another unit, we reallocate responsibilities fairly among the remaining team members</td>
<td>CAUTI</td>
<td>-.848</td>
<td>&lt; .01</td>
</tr>
</tbody>
</table>
137
As part of this sub-question, the researcher examined whether a relationship
exists between the dimensions of inter-shift or intra-shift teamwork and patient outcomes.
Two original questions in the survey related to the respondents’ overall satisfaction with
respect to the teamwork on their unit. These questions asked the respondents to rate their
satisfaction with teamwork that occurred within one’s shift and between shifts over the
24-hour period. Teamwork within one’s shift is referred to in this report as “intra-shift”
and refers to the ability to work collaboratively with those individuals who are working
side-by-side with the team member during the individual’s work hours. Between-shift
teamwork, also called inter-shift, occurs when one group of individuals leaves the
workplace at the end of their shift and is replaced by another group of workers. This
hand-off of care from one shift to another is a critical aspect of providing safe and
effective care in the medical-surgical environment. The NTS tool did not fully capture
these two distinct segments of teamwork, which may have important implications in the
acute care medical-surgical environment.
Statistical results for central tendency for inter- and intra-shift satisfaction with
teamwork is provided in Appendix H. This analysis included the range of responses,
mode, median, mean, standard deviation, variance, skewness and kurtosis per question.
The Shapiro-Wilk test for normality of data for both questions related to satisfaction with
inter- or intra-shift teamwork indicate a non-normal distribution with p < 0.5 for all units
and overall aggregate data.
One interesting finding is that although the mean response related to inter-shift
(between shift) teamwork was 3.23 on the 5-point Likert-type scale, indicating a
generally positive response ranging somewhere between “satisfied” and “very satisfied,


the analysis of the frequency table for inter-shift teamwork provided a more dismal interpretation. The frequency table (see Table 17) indicated that of the 154 responses, only 68 individuals (44.1%) provided a “positive” response of either satisfied or very satisfied with the teamwork occurring between shifts. Negative dissatisfied responses were provided by 27.9% of participants, with the remaining 33.8% of respondents neutral to the question. These results indicated that less than half the nurses are satisfied with the teamwork occurring between shifts on their units. This represents an opportunity for improvement in cultivating a more positive shift-to-shift experience.

Table 17

*Satisfaction with the Level of Nursing Teamwork Between Shifts*

<table>
<thead>
<tr>
<th>Numeric Response</th>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very dissatisfied</td>
<td>9</td>
<td>5.8</td>
<td>5.8</td>
</tr>
<tr>
<td>2</td>
<td>Dissatisfied</td>
<td>25</td>
<td>16.2</td>
<td>22.1</td>
</tr>
<tr>
<td>3</td>
<td>Neutral</td>
<td>52</td>
<td>33.8</td>
<td>55.8</td>
</tr>
<tr>
<td>4</td>
<td>Satisfied</td>
<td>57</td>
<td>37.0</td>
<td>92.9</td>
</tr>
<tr>
<td>5</td>
<td>Very Satisfied</td>
<td>11</td>
<td>7.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>154</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Comparatively, the aggregate data (n = 154) for intra-shift teamwork indicate a greater level satisfaction (M = 3.80) with the teamwork within one’s own shift as compared to inter-shift teamwork (M = 3.23). The frequency distribution for satisfaction with teamwork within one’s own shift indicated that greater than two-thirds of the respondents (68.2%) were satisfied or highly satisfied. A paired t-test analysis of inter
and intra-shift teamwork satisfaction data revealed a significant difference $t(153) = -7.281$, $p < .001$, with intra-shift teamwork receiving greater satisfaction scores as compared to the teamwork occurring between shifts. This finding adds credibility to the assumption that there is variability in teamwork between groups/shifts as compared to that within the same shift, with inter-shift teamwork providing the most dissatisfaction and opportunity for improvement.

The team members’ greater satisfaction with intra-shift teamwork as compared to inter-shift teamwork was found to be consistent unit to unit. Each of the eight nursing units rated satisfaction with intra-shift teamwork higher as compared to the teamwork occurring between shifts. The range of satisfaction for inter-shift or between shift teamwork was from 2.38 to 3.58. Similar to the other Nursing Teamwork Survey data, Unit 6 rated their unit’s intra-shift teamwork the lowest and Unit 2 rated their teamwork most positively. Similarly, when ratings for intra-shift teamwork are sorted, Unit 6 scored the lowest with Units 2 and 8 scoring the highest. A one-way ANOVA demonstrated a significant difference between the Unit 6 and Unit 2 ratings for inter-shift teamwork, $F(7, 146) = 3.99$, $p = .001$. Likewise, a one-way ANOVA demonstrated a significant difference between the Unit 6 and Unit 2 ratings for intra-shift teamwork, $F(7, 146) = 2.54$, $p = .017$.

Recalling the primary research question, Kendall’s Tau-b was performed to investigate the presence of correlations between the intra- and inter-shift satisfaction data and the NDNQI patient outcomes of falls, pressure ulcers, and CAUTI. A single significant finding between the variables of intra-shift teamwork and unassisted falls can be documented. The two variables were moderately correlated, $r(8) = -.618$, $p < .05$
(two-tailed) and demonstrated an inverse relationship as represented by the negative correlation value.

**Summary for research Sub-question 3: Which dimensions (constructs) of teamwork are associated with nurse-sensitive patient outcomes?** Several important correlations were noted between constructs of teamwork and patient outcomes. These relationships, along with the prior evidence established in nursing and healthcare literature as well as the already established high personal and organizational stakes for negative patient outcomes, lead one to believe that the null hypothesis should be rejected. The clinical relevance of that finding is there may be value in investing time, energy, and resources in educational and leadership strategies aimed at improving teamwork within the medical-surgical nursing sector, with the goal of improving patient outcomes.

While these results did not establish uniformity of relationships across all constructs of teamwork and all outcomes, and do not imply cause and effect, the author cautions against an overly zealous interpretation regarding the lack of statistical correlations for several reasons. First, the clinical significance of the reduction in negative outcomes associated with those units with higher teamwork scores deserves additional exploration. Second, the anecdotal evidence provided by nursing teams as described in the later qualitative portion of the report indicates that additional investigation is warranted before accepting null findings as absolute.

**Quantitative research Sub-question 4: What is the gap in educational preparation to support nursing team members in performing in a team environment?** The remaining quantitative sub-question investigated the team members’ past educational experiences regarding teamwork. Two author-originated questions in
the survey related to the respondents’ satisfaction with their educational preparation to perform in a team environment. The responses for both questions indicated a general agreement that participants were satisfied with the education they had received regarding teamwork. Overall, the satisfaction scores of 3.94 for formal education and 3.74 for employer-provided continuing education on teamwork on a 5-point scale indicate the nursing staff members completing the survey tool did not identify a gap in knowledge related to teamwork. Likewise, the responses per unit indicated a high level of satisfaction related to the education the nursing staff had already received regarding teamwork. Most units rated the education provided by the employer as satisfactory, but slightly less so as compared to formal education.

A paired sample t test indicated a significant difference between the satisfaction with formal education and the satisfaction with education provided by employer with the respondents indicating a lower satisfaction with the education provided by the employer. \((t = 2.930, p < .05)\). Of interest is the finding that Unit 6, the consistently lowest performing team of the eight nursing teams, was not the lowest performing team related to satisfaction with education. In addition, although the qualitative focus groups will later indicate that UAP express less satisfaction with education related to teamwork as compared to the RN participants, the quantitative data failed to demonstrate any statistically significant findings at the 0.5 level of significance between the RN and non-RN samples. There were no correlations found at the .05 level of significance related to satisfaction with education and NDNQI patient outcomes.

**Summary for research Sub-question 4: What is the gap in educational preparation to support nursing team members in performing in a team environment?**
The survey data indicated that participant satisfaction with their education related to teamwork was satisfactory. As described in a later qualitative section, this finding was not supported by qualitative data.

**Additional quantitative analysis of survey data.** The last statistical finding related to the NTS was discovered following the qualitative focus group sessions when the researcher recognized that some focus group responses varied between RN and non-RN staff. The researcher returned to the quantitative data to analyze whether any statistically significant differences existed in the NTS data when comparing the responses of the RN respondents and the UAP respondents. The data provided one finding of differences between RN and non-RN (UAP) samples. An independent samples t test was performed with a statistical difference found between RNs and the non-RNs for NTS question three which stated, “Team members frequently know when another team member needs assistance before that person asks for it.” The RN mean for that question was 3.31, and the mean for non-RNs was 2.74, which is one of only a few indicators falling below a 3 on the 5-point Likert-type scale. A t test indicated a significant difference in the RN and non-RN scores for this question \( t(152) = 3.048, p < .01 \) (equal variances not assumed). These results suggest the Unlicensed Assistive Personnel (UAP) or non-RNs believe other team members (perhaps the RNs) do not recognize when assistance is needed from a team member unless the team member asks for it. Conversely, the RNs do not recognize that issue as a concern to the same degree as the UAP. This finding has implications for targeted educational strategies between the two sub-groups.
Qualitative Findings

**Participation.** Three focus groups were planned at various times of the day as described in the research protocol. All individuals who were invited to participate in the quantitative portion of the research were also invited to participate in the focus groups. Although both RN and unlicensed participants from all three shifts participated in the focus groups and represented six of the eight nursing units in the quantitative study, the overall participation rate did not meet projected benchmarks. Units 4 and 5 were unrepresented with Units 3 and 6 having two representatives each. Multiple individuals who identified themselves as willing participants did not arrive to the scheduled focus groups. Some individuals provided notes of apology, most indicating their shift work was preventing them from attending the focus groups (requiring them to stay at work longer or some individuals indicated they were simply exhausted following their shift and opted out of participating). Eight participants completed the focus group sessions and provided the data for analysis. Six individuals were Registered Nurses and two individuals were unlicensed staff. Day, evening, and night shifts were represented by three, four, and one participants, respectively.

While the number of participants was limited, the total number of focus group participants fell within described ranges for a phenomenological investigation as provided by Creswell (1998, p. 64) who recommended 5 to 25 participants, and Morse (1994, p. 225) who recommended at least six participants. Furthermore, the participants provided rich data, and all three focus groups provided similar data. While saturation can be defined in many different manners, the researcher believed the data obtained from the three focus groups supported the secondary quantitative research as defined in the
proposed methodology and provided sufficient and complete qualitative data to fully answer the research questions and achieve saturation. Thus, no additional focus group sessions were conducted.

**Coding.** The method utilized for thematic analysis of the qualitative data followed a six-stage process as identified by Braun and Clark (2006) and as previously presented in Chapter 3. The investigation also utilized the process of inductive coding as described by Creswell’s (2007) description of qualitative data analysis. Following transcription, a systematic coding of the data was conducted using an open-coding approach (Creswell, 2007). The inductive coding of the data was performed using the track changes option in Microsoft Office Word 2010. Each descriptive code was marked using track changes until the entire transcript was coded. The transcript and codes were then reviewed to condense the descriptors into 10 codes with acronyms. A codebook was developed to describe the 10 codes. The codebook contains a definition and example for each of the 10 codes (see Table I1). Following systematic coding of the transcript, the researcher identified patterns and reduced codes to three overarching themes. Each code was assigned to the appropriate theme as provided in Table I2.

**Qualitative data findings and themes.** Three themes were identified from the interview data and subsequent codes. For each identified theme, coded evidence is presented from the interview demonstrating the applicability of the component to the overarching concept of teamwork in the nursing environment and applied to the research questions. The three emerging themes are: structure of teamwork, hallmarks of an effective (transformational) team, and outcomes of teamwork.
The structure of teamwork was the first identified theme and described the formation, composition, and framework of the team. The codes included in this theme comprised need and antecedents to team formation (NEED), definition of teamwork (DEF), team member diversity (DIV), the presence of formal education (ED) of team members, and barriers to teamwork (BAR). The need for a team, defining characteristics of a team, inherent diversity within the team, and educational background of the team members are issues believed to be common to all teams at some level and form the foundation or building blocks of the team. Unlike the “hallmarks of an effective team” theme, the inclusion data for this theme was structure-oriented rather than process-oriented and discussed the foundational or physical building blocks of the team. One characteristic, barriers to teamwork, offered a structural debit. Thus, this theme, the structure of teamwork, provided important data related to the following research questions in the study:

1. What descriptors do nursing team members use to define high quality teamwork?
2. What barriers of teamwork are identified by nursing team members working in a team environment?
3. What is the gap in educational preparation to support nursing team members in performing in a team environment?

The second theme, hallmarks of an effective (transformational) team, described the participants’ responses related to the processes of effective team formation and teamwork. These processes included the codes goal (GOAL), characteristics of teamwork (CHA), interventions with positive impact on teamwork (INT), and leadership
This second theme focused on the processes found within the team structure that strengthen the relationships within the team and are believed by participants to lead to positive outcomes. It is these processes described by participants as goal formation, a mutual vision of the team goals, goal driven, personal and group interactions, interventions, member accountability, and effective leadership believed to be the first evidence of what constitutes “transformational” characteristics defining high functioning (or transformational) teams. These processes, believed to promote teamwork, provide the foundational definition for “transformational” teams capable of achieving high quality outcomes. This second theme addresses two of the research questions:

1. What descriptors do nursing team members use to define high quality teamwork?

2. What are the leadership traits nursing team members identify as qualities that promote nursing teamwork?

The third theme, “outcomes of teamwork,” addresses the qualitative sub question: How do nursing team members describe the impact of teamwork on patient outcomes of falls, pressure ulcers, and CAUTI? The participants in the focus groups provided a qualitative view of the role of teamwork in promoting nurse-sensitive patient outcomes.

After identifying the codes and defining the three emerging themes, the qualitative data and themes were further described with examples. In addition, the qualitative data and themes were organized according to the research questions to provide the researcher a more organized viewpoint to later compare and triangulate the data with
the quantitative findings. Thus, the remainder of the description of the qualitative data and themes is grounded according to the research questions.

**Qualitative research Sub-question 1: What descriptors do nursing team members use to define high quality teamwork?**

The focus group data addressing this research question were identified in two separate themes: the structure of a team and the hallmarks of an effective team. Each focus group discussion started with participants identifying a personal definition of teamwork. The definitions varied, but generally centered on the concepts of collaboration and “working together.” One participant defined the team as “It’s a collaborative effort to accomplish a goal, and in our particular setting, it’s patient care and the quality of patient care.” This definition also identified the diverse nature of nursing teams. Another participant described teamwork as “it is working together for the benefit of your patients…with the focus being on your patients. So you can collaborate in order to make it the best possible stay for your patient. The best discharge for them. The best safety wise,… everything.”

These initial definitions provided a starting point for the understanding of the structure description of a nursing team. Universally, the nurses identified the patient both as the “need” for teamwork and the recipient of the team outcomes. In addition, the introductory statements contained a wealth of significant data regarding the framework of a team including concepts such as (a) team members’ need to work with others, (b) team member’s “willingness” or choice to work within a team structure, (c) the impact of the diversity of team members, (d) the role of collaboration in teamwork processes, (e) the goal-directed focus of a team, and (f) the perceived intersection of nursing teamwork and patient care outcomes.
Many of the comments related to the code of “NEED” for teamwork centered on the concept of “getting the job done.” For example, one participant indicated, “You have to have teamwork in order to get the job done…especially on a medical-surgical unit as I work…. You need to work with a team in order to get the job done efficiently.” This “getting the job done” task-oriented sentiment was echoed throughout each focus group. Additional statements included: “Not one person can get the job done,” “You need to have co-workers there with you to help you through the many circumstances,” “You can’t get the job done, and have good outcomes without having your teammates there.” And “You know, it’s the end of the day and everything has been checked off.”

This repeated focus of teamwork on getting the daily tasks done indicated a somewhat limited scope of the role of a nursing team. The participants discussed teamwork primarily related to a quantifiable completion of tasks during their particular shift, rather than to a greater focus on quality of care. The participants’ descriptions generally focused on completing all the required tasks prior to their shift ending and did not address broader issues such as decision-making, goal setting, process improvements, or outcomes until prompted by the interviewer.

The individuality of team members was a concept identified as critical in the formation of a functioning team. “I would say it is the ability and willingness to work with others, of all levels of education, background, ethnicity and comprehension.” Another participant talked about the value of individual strengths and interests stating, “You have people who are extremely interested in wound care, so they make the posters and do all the research for us on different things,…to keep you informed.” The dichotomy of teamwork and individuality (diversity) occurring simultaneously is an
interesting concept to explore. One Registered Nurse’s comments reflected the concepts presented in the “Toyota Principle” stating:

Each employee is a stockholder, and owns a piece of the outcome product. Each employee owns a piece of it, it may be the roller that puts the window down, it may be the motor placement, it may be the wheel placement. Each person owns a piece of the outcome (the car) which in our particular little configuration would be patient outcomes, or patient care, or patients getting healthy which is what we all seek.

Another described the importance of each individual “Owning your own role. Doing your responsibilities. Knowing what you are supposed to be doing and doing it.”

In summary, the important premises of the Structure Theme can be found in Table 18.

<table>
<thead>
<tr>
<th>Participant Comments Regarding the Structure Theme</th>
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<tbody>
<tr>
<td>A nursing team must be patient focused (patient-centered)</td>
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<tr>
<td>All members of the team must be willing to participate. This is a choice made by the individual group member.</td>
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<tr>
<td>The group must establish clear goals that are understood by all group members.</td>
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<tr>
<td>The group is committed to working together to accomplish the established goals.</td>
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<tr>
<td>All members of the team (Registered Nurses and UAP) understand the focus of the team, the goals, and their role in achieving the goals.</td>
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<tr>
<td>Achievement of the goals set by the team is viewed as a priority by all team members.</td>
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</table>
The second theme regarding nursing team members’ description of high-quality teamwork was labeled by the researcher as “Hallmarks of an Effective Team” and described the process characteristics believed to influence effective teamwork and improve patient outcomes. Hallmarks of an effective team included processes with codes such as establishing and working toward mutual goals (GOAL), characteristics of effective teamwork (CHA), interventions with positive impact on teamwork (INT), and effective team leadership (LEAD).

Collaboration and communication are important processes in teamwork. The concept of communication was repeatedly discussed and was one of the first components identified by each focus group as having significance to effective teamwork. “You need to have communication. You need to have collaboration amongst one another” (study participant). Another participant stated, “The communication…is very key. Collaborate with one another and decide what is best for the patient.” “When I think of our team not working effectively, a lot of times it has to do with personalities not matching, lack of communication, or a mix of the two.”

The discussions about communication were often coupled with that of the concept of collaboration. “What makes an effective team in my perspective is the willingness to appreciate and effectively contribute together” (study participant). The coded data also included references to the need to make better decisions, which can occur with team collaboration. One participant stated, “I think if it is a good team that is communicating properly, all decisions are made equally together, opinions are heard, suggestions are made, and the best product or the best answer to whatever the problem or question is then
achieved whatever that may be.” Individuals who indicated they worked in a cohesive team environment described a more consensus-based type of decision-making model.

Establishing clear goals is a primary function of the collaboration and communication. This goal-driven nature of an effective team was another repeated concept during the focus group interviews. Each member of the team must understand the purpose of the team and the mutual goals of the team. These concepts were exemplified in the following statements. “Well, the clarity of the goals is very important to understand who is the leader, where is the ultimate focus, and whose job is what, and the willingness then of each party to participate and accomplish that.” “If one person is not and the other person is very willing and committed, it is just not going to work.” The goal-directed nature of a team was a recurring focus in each of the focus groups.

The issue of trust was summarized by one non-licensed staff member:

I think it is important to have teamwork, and to trust who you are working with because if something goes wrong and if I’m the one in with the patient, they need to trust my judgment… you know that there is something wrong with that patient, and then they need to come in and follow up on that.

In addition, the issue of leadership falls under the theme Hallmarks of an Effective Team but is discussed later in the report with the respective research question.

The theme Hallmarks of an Effective (Transformational) Team can be summarized as in Table 19.
Table 19

Summary for Hallmarks of an Effective Team

| Communication: Communication is the key to successful teamwork. | Leadership: A variety of leadership processes within nursing and within teamwork requires that all RNs understand the concepts of leadership. Coordination of entire team (manager), coordination of daily activities (facilitator) and coordinator of patient care (RNs) roles. Role of leadership in directing all team processes. |
| Shared governance and the use of “huddles” result in improved communication, group decision making and consensus when appropriate. | Trust: Aides want to be trusted and have nurses respond to the patient concerns that they raise (validates their contributions to patient care and the importance of their role in the team). |
| Common Goals: Teamwork focuses on collaboration and working together to achieve common goals. | |
| Decision-Making: Staff need to believe that all opinions are heard. | |

Qualitative research Sub-question 2: What are the leadership traits nursing team members identify as qualities that promote nursing teamwork? Leadership of the team is considered to be an important aspect of an effective team. The leader of a nursing team can be defined in many manners. Each unit has an identifiable formal leader called a nurse manager. The Nurse Manager has 24-hour accountability and is the ultimate formal leader of the nursing team. In addition, each shift will name an identifiable leader for that shift, often called a charge nurse, team leader, or facilitator, which were the terms utilized in the NTS. However, leadership is the responsibility of all Registered Nurses, including the bedside nurse who must coordinate care of the patient with the UAP or other staff when leaving the unit for any period of time. Thus, for the purpose of the focus group, the question regarding leadership did not define a specific person as the leader but rather asked about leadership traits regardless of the title of the individual
serving as the leader. The question was phrased, “What are the leadership traits which nursing team members identify as qualities that promote nursing teamwork?”

Each focus group provided unsolicited, animated, and passionate conversation regarding the role of leadership. Every participant provided comments about the importance of leadership for a team. Comments included, “A good leader makes a big difference in your team” and “leadership is a key component of high performing teams.” Another stated, “I think if you don’t have an effective leader it shows. That is a barrier to teamwork.”

When asked to describe the characteristics of leadership that promote teamwork, the responses varied. “A leader who “cares about us” “is there for us” “assists us” and “willing to fight for things that we need like supplies” were some of the initial responses. Focus group members described the importance of leadership presence and visibility, especially in times when the unit is busy or “chaotic.” The leader who knows how to capitalize on the strengths and weaknesses of everyone, “keep people motivated,” “keep people energized” is important to teamwork. Team members look to the leader for a stable presence and to be fully involved and visible in the team processes.

They are very visible on the unit. They make themselves well known on the unit so I would have to say that they are more a part of our team than having to just be there to resolve issues so the issues are kind of hopefully caught sooner rather than waiting until it is a bigger problem.

Two focus groups discussed that a leadership strategy for promoting teamwork was that of constructive criticism, rather than utilizing a more disciplinary model of leadership. One participant described working with a leader whom she perceived to be a disciplinarian and stated the manager was “constantly looking for us to make mistakes so
they could be pointed out.” While she recognized the manager was performing an important role of monitoring performance, the perception of the staff was that the manager was simply looking for mistakes that did not lead to improved outcomes so they could be pointed out to staff.

Another description of the role of leadership from the staff perspective was:

Recognizing there is a problem within the team, and stepping in before it becomes an issue. Noticing that one person or that one group or one shift, or whatever is going in the wrong direction, and step in before it would get to the point where your Press Ganey scores are affected, or moods are affected, and people are affected. Somebody who recognizes it is extremely important.

Staff nurses provided their belief that the caliber of team leadership results in improved patient outcomes. Some participants described changes in leadership, which they believed resulted in improved teamwork and better outcomes.

So now we have a nurse manager who again is fantastic and our Press Ganey scores are rising… Press Ganey scores have been much better than they were from that one-year period of lapse where we didn’t really have a real leader.

Participants were supportive of the unit leader and spoke in a positive manner about the important role the leader plays in teamwork. Focus group participants indicated their perception of the role of leadership in promoting teamwork included multiple characteristics as described in Table 20.
Table 20

*Team Leadership Characteristics Perceived by Team Members to Result in Improved Teamwork and Positive Outcomes*

| Communication - clear and relevant directions | Monitor progress of the team – note problems early | Address problems quickly and thoroughly |
| Seeing the big picture | Motivating the team – avoiding when possible the use of discipline as a primary motivator. Use positive reinforcement. | Address issues related to “problem employees” |
| Coordinating | Deal with conflict within the team; helping team members to deal with interpersonal conflict. | Stand up for staff |
| Assuring adequate staffing for the team and balancing workload | Setting expectations and holding people accountable | Reliability |
| Setting expectations | | Dependability |
| Holding others accountable to the expectations | | Ability to provide constructive criticism |
| Organization | | Pitches in to help during times of difficulty |
| Visibility on the unit | | |

Qualitative research Sub-question 3: What barriers of teamwork are identified by nursing team members working in a team environment? The question regarding barriers to teamwork sparked an immediate emotional response in several participants. Identified barriers of teamwork included team members’:

Lack of communication, that lack of integration or collaboration of working together shoulder to shoulder through personal differences, number of staffing, individual problems with each other as far as staff members, and abilities being assumed that may not be there or should be there and aren’t.

The importance of individual attitudes was discussed with great emotion. Several participants indicated that a single negative individual on a team can have dramatic influence on the ability of the team to function to its full capacity. In addition, the nurses reported having great difficulty confronting the negativity and described the tendency to
avoid the negative team member, failing to address the negativity and its impact on the team. For example, one Registered Nurse stated, “In this field there are a lot of attitudes. I think that needs to be put aside. You’re not going to have a good team if there is cattiness. Wholeheartedly I believe that one person can definitely affect the mood of many.” Another stated, “One person with a bad attitude known to not cooperate will throw off the whole dynamics in what you do. Definitely!”

When asked how an individual’s negativity affects teamwork, the participants unanimously agreed that negative attitudes impede teamwork. The participants recognized that one team member can have a major negative impact on teamwork but indicated they felt some powerlessness at knowing how to deal with the situation involving the behaviors of other team members. “You’re not willing to help as much as you would, because you don’t want that mood to affect your actual work day and your regular day.” Despite the recognition that teamwork is necessary for successful patient outcomes, and that negativity hinders teamwork, the nurses indicated they often avoided the negative individual and situation rather than attempting to influence or correct it. “We don’t want all of the drama.” “I don’t say it’s the right thing to do or the responsible thing to do, but naturally you just want to avoid it.” “I think we’re not good at holding people accountable as we can be.”

The topic regarding a lack of teamwork that occurs between shifts and during patient handoffs also sparked interesting conversation. All participants agreed that inter-shift conflict exists. The nurses fervently described the lack of team cohesiveness between shifts but displayed little motivation to make improvements in that area.
Honestly I don’t think there is much of an effort or much importance to resolve because for the most part we only see them for a ½ hour out of our 12-hour or 8-hour shift. In the end, I think we mostly just kind of huff and puff and get over it. Just learn that it is going to be that way, and it will forever be a battle of the shifts, dayshift, night shift and evening shift.

One participant provided the following exchange:

PARTICIPANT: We have a zero tolerance policy that you can’t blame the shift before you or after you. You are accountable for what happens. If there is a procedure to be done, or a med that wasn’t hung, if you notice it on your shift it’s your responsibility to take care of it. You don’t need to complain about it. It just needs to be done.
INVESTIGATOR: Do people abide by that?
PARTICIPANT: No.

The avoidance of conflict, rather than addressing individual team members, was described as the norm across all nursing units. Focus group participants indicated team members do not have the skills to effectively deal with conflict. Conflict often remains unresolved and interferes with team function. Some participants indicated that RN and UAP conflict exists. UAPs want to feel respected by RNs; UAPs also want to be “trusted” and supported that their findings are valid.

The quantity and intensity of focus group responses, along with the animated tone and non-verbal behavior, caused the researcher to return to the quantitative data to search for evidence supporting the reports of the focus group participants. The additional quantitative data are presented in the next section focusing on triangulation of data and findings.

Another barrier recognized by focus group participants was the constantly evolving membership of the team as people leave the team and new replacements are hired.
New faces affect teamwork – difference when you get people from other units, and I’m talking like new nurses, float nurses or someone who doesn’t normally work with you. I’m not saying falls happen when they are there, but it’s not like the same teamwork, you know.

Another stated, “You don’t have the same exact team. You can see differences when it’s not the team you are used to working with.”

All participants indicated that staffing levels have an impact on teamwork. The participants indicated that high patient-to-nurse ratios generally inhibit teamwork. One participant mentioned, “Low staffing absolutely affects the teamwork because you have a heavy assignment. Someone can’t help you because their assignment is heavy.” Another stated, “When things become busy that definitely affects teamwork.”

The participants had conflicting ideas related to the advantages of 8-hour versus 12-hour shifts. Some individuals believe implementing 12-hour shifts adds continuity over the shifts because the 12-hour individual can provide valuable first-hand information to both shifts. Furthermore, when the same two individuals work 12-hour shifts back-to-back, the “handover process is smoother and more consistent as those two individuals become the primary “team” for that patient, handing the patient back and forth between those two individuals. However, other participants indicated that when 12-hour shift workers are interspersed with 8-hour shift workers on the same unit, it causes additional team chaos related to coverage and changes in assignments.

Some participants who indicated they had worked under several models of care believed the change to “primary nursing” negatively impacted teamwork.

We’ve become so focused on getting the job done that we don’t have time to see that you need help with something. Whereas, when we worked “team nursing,” we knew all of the tasks that needed to be done, and people would just take the
tasks and do them. Now everybody is so siloed. Nobody knows about what the other person is doing.

Other participants concurred that the primary nursing model diminished overall teamwork. “The nurses now are just focused on their own assignment.”

In addition, some focus group participants believed a lack of understanding exists regarding the roles of RNs and UAPs. The RNs indicated they are pulled in multiple directions and cannot always react immediately to the needs of the UAP. The UAPs indicated they do not always feel valued, especially for the observations they may make and report to the RN. This results in a lack of trust, which is a barrier to ongoing teamwork. One participant stated:

Lack of trust is a barrier. If you can’t trust the other person on the team, and feel the need to keep checking up on other person (RN is accountable for the care), then you’ll just be spinning your wheels and not really getting anywhere.

The final barrier discussed by the groups was stress.

Stress is very key. If the nurse isn’t at their best, if the nurse isn’t taking care of themselves, they are not taking their lunch breaks, they are not getting to the bathroom, they are going to be overwhelmed because they are doing so much that they are not taking care of themselves, they will be fatigued, so I guess fatigued nurses, that is definitely going to cause a breakdown in communication, a breakdown in the teamwork, and frustration in general.

All focus group participants indicated that individual stress can be a barrier to teamwork.

The RNs and UAPs discussed several of these barriers from different vantage points. The noted differences caused the researcher to return to the quantitative data and reevaluate the data from a RN versus non-RN standpoint. As previously indicated, one finding resulted from that investigation related to the statement: “Team members frequently know when another team member needs assistance before that person asks for it.”
**Qualitative research Sub-question 4: What is the gap in educational preparation to support nursing team members in performing in a team environment?**

The final concept of importance is the participants’ perceived lack of formal education provided to nurses regarding critical team concepts and conflict management within a team. Although the nature of the nurse’s work requires that individuals become skilled at teamwork, the formal education of nurses is relatively void of that essential learning. Recognition of this dichotomy came as a surprise to one participant who stated, “It is a mystery to why we are having this absent in our training!” One of the unlicensed staff indicated:

I have been here almost six years and I have never received any education on teamwork until recently when they rolled out the Relationship-Based-Care (RBC). I think people automatically assume that people know how to have good people skills, communication, and personality to work with a team. Some people don’t understand what really is involved in that.

Many of the Registered Nurses indicated they had received small sections of teamwork education in various sessions, such as preceptor courses, shared governance courses, facilitator courses, LEAD courses, RBC courses. Anecdotally, the focus group RNs appeared to be more satisfied with the education offered to them as compared to the nursing unlicensed nursing staff. Although none of the participants indicated that the education they received had a strong focus on teamwork, the two most noticeable gaps discussed by participants included general teamwork education for the unlicensed assistants and more advanced teamwork skills such as understanding different personalities, problem solving in a group, and conflict management for the Registered Nurses. Some focus group members indicated that additional didactic information on teamwork may not be as helpful as team-building exercises and active learning
experiences, especially related to understanding each other’s roles. One participant indicated the actual process of working in a team environment is different from the “textbook” version.

In my nursing program we took a course that taught you how to be a leader. It dealt with teamwork a bit. It really wasn’t anything like it is… It’s not like it is on paper. It’s much different when you put real people into the mix.

Assisting nursing team members with practical application of teamwork constructs and mentoring nurses to work in a team environment may provide more powerful tools as compared to pure didactic education.

Qualitative research sub-question 5: How do nursing team members describe the impact of teamwork on patient outcomes of falls, pressure ulcers, and CAUTI?

Participants were asked to offer their personal perspective regarding the effect of nursing teamwork related to the same outcomes utilized in the quantitative portion of the study. The remarks provided unequivocal opinions regarding the perceived direct relationship of teamwork to these outcomes. All participants were in agreement that there is a strong connection between outcomes and teamwork. Each participant was asked to rate the importance of teamwork to patient outcomes on a scale of 1-10. One respondent stated:

Absolutely. Each individual outcome that you brought up, whether it is wounds, urinary tract infections or falls, they all have different aspects, of which you could be single versus needing multiple people to assist you depending on various portions of care, …but in a whole I would say it is absolutely a 10 no matter what.

A participant simply stated emphatically, “Teamwork is huge (emphasized) in patient outcomes.” Another participant explained, “teamwork doesn’t always necessarily lead to good outcomes, but when the team is not functioning it’s a lot worse.” A different participant stated, “You can tell when the teamwork is working effectively and you can
tell when the teamwork is not working effectively because the NDNQI scores are definitely affected by that (teamwork).”

**Results and Interpretations**

**Triangulation of Data**

The qualitative and quantitative datasets provided several opportunities to deliver a deeper and more comprehensive examination of the teamwork constructs to better validate the research findings. Triangulation is the collection of data using a variety of complementary sources (Maxwell, 2005). The use of triangulation is important to limit bias and gain a broader perspective of the issue being studied (Maxwell, 2005).

A comparison matrix was developed to analyze data and triangulate findings. The research question and sub-questions served as the foundation of the matrix, with the quantitative survey data and qualitative themes serving as the horizontal axis. The matrix, too complicated to provide in text, is provided in Appendix J and serves as a summary of all research findings.

**General Patterns and Trends**

Several patterns and trends emerged from the Nurses Teamwork Survey data and correlational findings. The patterns and trends are summarized into key findings in Table 21 along with the associated research questions.
### Key Findings

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Key Finding</th>
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<tbody>
<tr>
<td>What patterns exist across medical surgical nursing teams when comparing teamwork constructs and patient outcomes?</td>
<td>Key Finding #1: Statistically significant relationships have been demonstrated between nursing teamwork and patient outcomes of falls, pressure ulcers, and CAUTI. Correlations do not imply cause and effect. Qualitative data support the findings and indicate that team members’ experiences note the importance of teamwork in producing quality outcomes.</td>
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<tr>
<td>Which dimensions (constructs) of teamwork are associated with positive nurse-sensitive patient outcomes?</td>
<td>Key Finding #2: Levels of teamwork differ from one nursing team to another. (Not all nursing teams function at the same level of performance.)</td>
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<tr>
<td>How do nursing team members describe the impact of teamwork on patient outcomes of falls, pressure ulcers, and CAUTI?</td>
<td>Key Finding #3: Nursing teamwork is a complex process and a compilation of different constructs and processes. A team may be strong in one, some, or none of the constructs. Rank order of constructs can indicate where a team’s strengths and weaknesses exist.</td>
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<tr>
<td>What is the variability in teamwork constructs across medical-surgical nursing units?</td>
<td>Key Finding #4: The nursing team is transitory and frequently experiences change in membership.</td>
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<tr>
<td>What barriers of teamwork are identified by nursing team members working in a team environment?</td>
<td>Key Finding #5: Nursing Team members’ descriptions of high quality teams fall into three categories including the structure, process and outcomes of the team.</td>
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<tr>
<td>What descriptors do nursing team members use to define high-quality teamwork?</td>
<td>Key Finding #6: Team leadership is critical to the success of teamwork.</td>
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<tr>
<td>What are the leadership traits which nursing team members identify as qualities that promote nursing teamwork?</td>
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<td>Research Question</td>
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<tr>
<td>What barriers of teamwork are identified by nursing team members working in a</td>
<td>Key Finding #7: The critical nature of teamwork in healthcare has been</td>
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<td>team environment?</td>
<td>established in recent literature. However, multiple barriers to nursing</td>
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<td>teamwork exist. The nursing profession struggles to execute teamwork in an</td>
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<td></td>
<td>effective manner.</td>
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<td>What barriers of teamwork are identified by nursing team members working in a</td>
<td>Key Finding #8: Avoidance of conflict: Nursing team members avoid conflict</td>
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<td>team environment?</td>
<td>within the team.</td>
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<tr>
<td>What is the gap in educational preparation to support nursing team members</td>
<td>Key Finding #9: The data regarding the educational needs of nursing team</td>
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<td>performing in a team environment?</td>
<td>members provide some inconsistent findings.</td>
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</tbody>
</table>

**Summary**

The findings of this study are similar to those of Kalisch and Lee (2009) who indicate many nursing teams fail to function as a true team. The focus group interview process utilized in this project was designed to build upon the research of Kalisch, Weaver, and Salas (2009) who conducted a qualitative study applying a theoretically based model of teamwork in the nursing setting. During this prior research, the authors conducted focus groups and analyzed participant responses regarding team processes in their daily work. The mixed methodology utilized in this project built upon that work and identified the participants’ perspectives regarding the importance of nursing teamwork related to patient outcomes. The data also mirrored the findings of Knaus et al. (1986) and Katzenbach and Smith (1993) reinforcing the important role of teamwork in nursing practice. Likewise, both the interview and quantitative survey suggest that lack
of teamwork continues to plague the nursing profession as initially described by Schaefer, Helmreich, and Scheidegger (1994) and Page (2004).

The research provided rich qualitative and quantitative data regarding the role of nursing teamwork in the provision of high-quality patient care. The research data suggest that according to the nurse’s perspective, teamwork is a critical influential factor of patient outcomes. The research findings also suggest teamwork in the medical-surgical nursing teams is similar to that in other areas of healthcare demonstrating a relationship between teamwork and outcomes. Although the design and methodology of the research prevents any generalizable connections from being made, the research has generated an interest in further exploring the connection between nursing teamwork and nurse-sensitive outcomes, including pressure ulcers, falls, and catheter associated infection. In addition, the findings reveal some areas for potential improvements, curriculum development and educational interventions.
Chapter 5: Conclusions and Recommendations

**Introduction and Executive Summary**

Preventable adverse patient outcomes plague healthcare and the nursing profession. The objective of this study was to investigate the relationship of teamwork within acute care medical-surgical nursing units to specific nurse-sensitive patient outcomes. The outcome measurements included that of patient falls, pressure ulcers, and CAUTI. The mixed methodology protocol included several types of data collection. The Nursing Teamwork Survey (Kalisch et al., 2010) was administered to Registered Nurses and unlicensed nursing staff members on eight medical-surgical units in an acute care hospital in Northeastern United States. The survey also collected demographic information and questions related to satisfaction with teamwork between and among shifts as well as to the individual’s personal satisfaction with prior educational offerings regarding teamwork.

After the required approvals had been obtained, the nursing staff members on the eight medical-surgical units were provided with the invitation to participate in the survey. The survey data were collected using electronic survey software over a one-month period. One hundred fifty-four participant surveys were analyzed. Survey responses were coded according to each nurse’s unit of work.

The teamwork survey data served as the independent data. National Database of Nursing Quality Indicators (NDNQI) data provided the outcome measurements representing nurse-sensitive patient outcomes occurring on each of the eight research
units. Three dependent variables were analysed separately including falls, pressure ulcers, and catheter-associated infections.

Descriptive findings indicate that nursing units perform differently regarding the type and level of teamwork. Teams with higher teamwork scores overall and for individual constructs demonstrated better raw scores in patient care outcomes including total falls, injury falls, unassisted falls, and CAUTI. Analysis of the correlations between the teamwork data and nurse-sensitive outcomes provided some statistically significant findings indicating a relationship exists between teamwork and the negative nurse-sensitive outcomes of falls, pressure ulcers, and CAUTI.

In addition, qualitative focus group data were collected following the completion of the quantitative data collection. Three focus groups were conducted with participants providing input on their lived experiences of teamwork on their nursing units. Focus group participants also unanimously agreed that nursing teamwork is a critical aspect of preventing negative patient outcomes.

**Results and Interpretations of Key Findings**

**Key Finding One:** Statistically significant relationships have been demonstrated between nursing teamwork and patient outcomes of falls, pressure ulcers, and CAUTI. Correlations do not imply cause and effect. Qualitative data support the findings and indicate that team members’ experiences note the importance of teamwork in producing quality outcomes.

**Results.** The raw data support the premise that improvements in teamwork result in fewer negative patient outcomes. The raw score data implied units with a high degree of nursing teamwork as measured by NTS also demonstrated lower (better) NDNQI patient outcomes of falls, pressure ulcers, and CAUTI. Correlations between NTS teamwork constructs resulted in a statistically significant correlation between Shared
Mental Model and falls. However, multiple statistically significant findings were also noted for specific questions within the NTS as well as intra-shift teamwork and the NDNQI outcomes of falls, pressure ulcers, and CAUTI. Focus group participants unanimously agreed their perceptions based on experience were that teamwork directly influenced patient outcomes, especially nurse-specific outcomes. One participant broadly stated, “Teamwork is huge in patient outcomes.”

Interpretations. Multiple inverse relationships exist between nursing teamwork and patient outcomes. Relationships and correlations do not imply causation or cause and effect. However, the clinical significance of the presence and/or improvement of negative patient outcomes is critical. The importance of this finding may add substantial knowledge regarding the role of nursing teamwork in decreasing negative patient outcomes. Highly functioning teams with high performance in quality outcome indicators are considered by the researcher to be “transformational teams.” The full extent of correlation between transformational teams and NDNQI patient outcomes is yet to be determined. Relationships between NDNQI outcomes and specific questions within the NST may provide a more targeted approach to research recommendations.

Falls. The statistical correlational data from the Nursing Teamwork Survey and the NDNQI outcome data provided only two correlations, both related to unassisted falls. The first correlation as it relates to falls was that of Shared Mental Model and the second was intra-shift teamwork. Focus group participants also unanimously agreed that nursing teamwork is a critical aspect of preventing patient falls.

The clinical significance of these findings is twofold. First, a correlation between teamwork and falls is of great importance. Most importantly, patient falls are significant
negative outcomes that have tremendous and long-lasting negative consequences for patients. Falls, especially in the elderly, have severe personal, medical, and fiscal consequences, and can even result in death. Each individual preventable fall is significant. Based on original work by Stevens, Corso, Finkeelstein, and Miller (2006), the Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention determined that in 2012, the total direct medical costs of fall injuries for people 65 and older, as adjusted for inflation, was $30 billion (CDC, 2012). The economic burden on hospitals created by falls and injuries related to falls is enormous.

The second issue of significance relates to the opportunities for improvement. Any eventual impact in reducing falls will have significant meaning for both patients and healthcare organizations. The concept of Shared Mental Model included topics such as team members understand what their responsibilities are throughout the shift, team members know that other members of their team follow through on their commitment, quality results when all the members work together, and respect for each other. Educational programs can be targeted to these specific criteria as a means to improve teamwork. While the impact on patient outcomes cannot be determined from this evidence, the improvements in teamwork alone are important.

**Pressure ulcers.** One teamwork finding correlated to the occurrence of newly acquired pressure ulcers. That finding dealt with the nursing team’s ability to deal with conflict within the team. The question, “most team members tend to avoid conflict rather than deal with it” had an inverse correlation with stage two or greater (deeper) unit-
acquired pressure ulcers. In addition, focus group participants indicated the prevention of pressure ulcers requires a concerted team effort.

Pressure ulcers have a substantial impact on an individual’s quality of life due to the pain, interventions, infections, and increased length of stay in a hospital or institutional setting. The USAHRQ (2011) reported that the cost of pressure ulcer-related hospitalizations ranged from $20,900 to $151,700 per pressure ulcer. In addition, Medicare estimated that each pressure ulcer added $43,180 in costs to a hospital stay (USAHRQ, 2011). USAHRQ also indicates that approximately 60,000 patients die as a direct result of a pressure ulcer each year. The fiscal significance to the organization can be great as well. The occurrence of pressure ulcers results in over 17,000 lawsuits annually, representing the second most common litigation claim after wrongful death. Thus, the clinical significance of this finding is important in that the personal and organizational cost of pressure ulcers is enormous.

**CAUTI.** Eight different individual teamwork variables from the NTS provided statistically significant correlational data related to CAUTI. These variables included issues related to RN and Nursing Assistants working together, completeness of shift change reports, workload distribution, ability of team members to focus beyond their own assignments, understanding of roles and responsibilities within the team, ability to seek and provide constructive feedback within the team, and reallocation of workload responsibilities throughout the shift due to changing staffing. Although focus group participants continued to indicate they perceived a strong relationship between teamwork and CAUTI, they described what they perceived as a slightly less direct influence.
Similar to the descriptions of other negative outcomes, CAUTI has been associated with increased morbidity, mortality, hospital cost, and length of stay (CDC, 2012).

**Overall clinical significance.** Thus, the clinical significance of noting that those units with higher scores in teamwork also had lower rates of negative occurrences of falls, pressure ulcers, and CAUTI is of utmost clinical importance. While the research methodology fails to provide any cause and effect data, participants corroborated the finding with anecdotal examples of the relationship. “You can tell when the teamwork is working effectively and you can tell when the teamwork is not working effectively because the NDNQI scores are definitely affected by that.”

**Key Finding Two: Levels of teamwork differ from one nursing team to another.**

**Results.** Data suggest that teamwork varies among similarly focused medical surgical teams. This concept was supported by the qualitative findings when participants described teamwork strengths and opportunities for improvement that vary from unit to unit. Both the overall results for teamwork data (n=154) and unit-specific data (n = 8) demonstrated a range of information related to nursing teamwork. The data confirmed several patterns. First, a difference exists in teamwork from one nursing unit to the next. This pattern was demonstrated by the variance of results noted in similar medical-surgical units. While the data do not make any determinations regarding the cause of the variance, they suggest not all units function in the same manner. It is an assumption made from the data that some teams function at a higher level of teamwork than others as defined by the constructs in the NTS.

In addition, both the quantitative and qualitative data suggest that nursing units fall into one of three patterns. The first pattern identified was of those units that
consistently scored higher in overall teamwork score and all five constructs of teamwork. These highly functioning teams consistently out-performed the other teams in all teamwork categories. The teamwork data from Units 2 and 8 demonstrated this strong teamwork component in the overall teamwork score as well as in each construct. The second easily identifiable pattern was those units consistently scoring lower in overall teamwork scored lower in each of the constructs as well. Unit 6 demonstrated this pattern. The remaining five nursing units vacillated in the mid-range of the data with no clear identifiable pattern. The quantitative finding was supported in qualitative data. Qualitative findings indicated participants described teamwork strengths and opportunities for improvement, which varied from unit to unit. In addition, participants indicated the unit’s teamwork fluctuated with changes in membership or leadership, making consistency within the team a challenge.

**Interpretations.** Higher functioning teams are defined by the researcher to be “transformational teams.” The research findings reflect the concept that teamwork within a group will vary from one time period to another, which may provide future opportunities to explore the underlying causation and implications of variations and changes in teamwork functioning and performance. The importance of the finding is that varying team performance may provide an opportunity for education and practice changes to improve teamwork, with the eventual goal of improving patient outcomes. In addition, the importance of improving teamwork at the unit level is supported by research demonstrating that quality improvements should be focused at the most applicable organizational level; thus patient safety quality should be addressed at the unit level (Smits, Wagner, Spreeuwenberg, van der Wal, & Groenewegen, 2009).
Key Finding Three: Nursing teamwork is a complex process and a compilation of different constructs and processes. A team may be strong in one, some, or none of the constructs. Rank order of constructs can indicate where a team’s strengths and weaknesses exist.

Results. The constructs in rank order provided an overall assessment of the strongest and weakest teamwork constructs in the sample. The highest-ranking teamwork construct for this sample was that of Shared Mental Model, followed by Team Leadership, Trust, Backup, and, lastly, Team Orientation. There was a consistent pattern in this sample in that 7 of the 8 units ranked lowest in Team Orientation. This pattern was further validated by the assessment of individual questions demonstrating consistently lower scores in those questions coded to the Team Orientation construct. The data from the focus groups also confirmed this finding and provided additional evidence that the lack of Team Orientation provides an opportunity for developing targeted curricula and interventions to improve teamwork.

Interpretations. Team Orientation may be the most difficult construct to achieve and, thus, presents the greatest opportunity for improvement. The specific areas addressed in the Team Orientation questions and focus groups include items such as improving inter-shift teamwork, providing a process for a 24-hour plan of accountability for care rather than shift-by-shift, dealing with conflict within the team, team decision making, dealing with different types of personality traits within the team, and helping individuals be more focused on the goals of the team. In addition, teamwork is sometimes viewed by nursing team members as getting the work done for the shift, rather than as performing long-term assessment, planning, and strategies for successful patient outcomes. This type of limited definition lacks comprehensive teamwork concepts such
as team visioning, shared goals, decision making, accountability as a team. This finding provides opportunities for enhancement and suggests that the concept of Team Orientation, ranked lowest, may provide the greatest opportunity for improvement in overall nursing teamwork.

**Key Finding Four: The nursing team is transitory and frequently experiences change in membership.**

**Results.** One identifiable pattern gleaned from the demographic survey data reflects a lack of stability in the team members. The demographic data provided evidence indicating that while the majority of team members worked in their current role for more than five years, the majority of participants worked fewer than three years on their current unit, creating a constantly evolving nursing team. This pattern presents an interesting challenge to nursing teams in that the unit nursing team lacks member stability and is constantly shifting in membership.

Participants in the focus groups stated that the patient care team may include staff who do not work steadily on that unit such as per diem staff, “prn pool” who float from other units, or supplemental agency staff from external employment agencies. The participants reported that these individuals were typically not familiar with the unit, in essence creating the need for nursing teams to form a new team at the start of each shift. The participants verified the transient nature of nursing teams and spontaneously provided supporting data indicating a belief that the lack of stability due to new members or float pool greatly impacts consistency of nursing care and patient outcomes.

The changing team membership was further compounded by the use of a variety of shifts within one 24-hour period. While some team members might work for 12 hours,
others work for only eight, creating a constantly evolving team even within an 8-hour period of time and further creating conflict, communication challenges, and confusion by necessitating the change of assignments partway through an individual’s shift.

**Interpretations.** The standard definition of a team as a constant set of individuals working interdependently for a common goal does not adequately describe the changing nature of nursing teams. Therefore, utilizing typical theoretical frameworks for teamwork functioning such as Tuckman’s (1965) model of teamwork theory (forming, storming, norming, performing) will not adequately address the complex and fluid nature of nursing teams, which are “reforming” on an almost daily basis due to changes in membership. Leadership activities theoretically prescribed for the varying stages of team formation will be challenged by the transient nature of nursing teams. To more fully understand the impact of changing membership, nursing leadership needs to gain an understanding of the concepts of both change theory and teaming theory. Nursing can find direction from organizational behavioural theories to more clearly understand the impact of constant changing membership on team effectiveness, productivity and outcomes (Wageman, Gardner, & Mortensen, 2012).

This unanticipated finding coincides with recent research conducted by Columbia University School of Nursing and Columbia Business School demonstrating that patients have improved outcomes and shorter length of stay when the staff treating them has experience in their current job. The study found that increasing the average tenure of the nursing staff by one year decreased length of stay by 1.3% (Beaulieu & Phibbs, 2014). The finding also mirrors prior research demonstrating that outcomes are improved when permanent staff provide the care and temporary staff are diminished (Roseman & Booker,
constantly changing team on patient outcomes has not been established but provides an area of consideration for nursing practice and employer-provided nursing education.

**Key Finding Five:** Nursing Team members’ descriptions of high quality teams fall into three categories or themes including the structure, process, and outcomes of the team.

**Results.** Three themes emerged from qualitative data to describe high-quality transformational teams. The structure of the team relates to the foundation of the team, which includes the composition of the team. The patient is the central figure in all nursing teams and the focus of goals and outcomes. Participants indicated that the definitions of team and teamwork are sometimes confined to a narrow “getting the work done” view. The structure of the team includes the willingness of participants, clearly identified goals, team diversity, and recognition of the individual strengths of the members. A team with a strong foundation or that is well structured is better prepared to engage in effective communication and transformational teamwork strategies. The second theme, hallmarks of an effective team, described the multiple processes impacting the functioning of a nursing team and the quality of teamwork. Last, the outcomes of the team are the result of goal-directed processes. Patient outcomes are a top priority for nursing teams. When teamwork is effective, each individual feels wholly responsible for the outcomes and is fully engaged in process improvements. Nursing team members anecdotally believe teamwork directly impacts outcomes.

**Interpretations.** Nursing Team members aptly described high-quality teamwork as a complex continual process designed to provide quality care to patients and achieve quality outcomes. Nursing team members recognized how teamwork structure and
processes lead to quality outcomes. This ability to provide in-depth analysis of high-quality teamwork is in direct opposition to the “teamwork means getting the tasks done” definition previously described. As previously described, one possible interpretation is that the intense responsibilities placed on nursing team members on any given shift alters the focus of individuals from the achievement of team goals to the survival mode of simply “getting the tasks done” before the end of the shift.

The three-pronged description of high-quality transformational teamwork provided by the focus group participants identifies the patient as the central theme and mirrors the Donabedian Theory (Donabedian, 2003). In addition, the findings reflect prior research related to the Toyota Production System Principles as described by Toussaint and Berry (2012). The philosophy of the Toyota Production System Principles is designed to stimulate individuals to achieve optimal individual and team performance. When team members “own” their role in the team, they are empowered to make process improvements and problem solve to maximize quality. A team practicing these principles will set the expectation for every team member to strive for overall improvement and excellence. A transformational team practices excellent communication, shares a common vision, sets achievable and value-rich goals, delegates distinct responsibilities to the appropriate individual within the team, and holds each member accountable for the outcomes of the team.

Key Finding Six: Team leadership is critical to the success of teamwork.

Results. The critical role of leadership and the leader’s role in facilitating team-wide communication were two emphasized and animated discussions in all three focus groups. Participants provided specific examples of how changes in leadership and
leadership style impacted teamwork along with a perceived subsequent impact on patient outcomes. Participants recognized the importance of the role of team leadership, and looked to the leader for structure and guidance through the teamwork processes. The participants (as team members) outlined a series of characteristics they believed would help a team achieve success. Without ever actually using the term “transformational leader,” the focus group participants described characteristics of leadership such as having an emphasis on helping every member of the group succeed, inspiring others, working toward common goals, and concentrating on building morale of the team.

Team members provided examples and identified the key role leadership plays in promoting teamwork, which impacts positive patient outcomes. In addition, the team members defined key leadership attributes not mentioned in the teamwork survey or in the underlying theoretical framework. These attributes serve as markers for leadership competencies and leadership education and include such items as seeing the big picture, visibility on the unit, addressing problems quickly and thoroughly, holding others accountable including those identified by others on the team as problem employees, assisting with hands-on delivery of care during times of difficulty, use of positive reinforcement, dealing effectively with conflict, and helping team members deal with interpersonal conflict.

**Interpretations.** Transformational teams require transformational leadership. The Transformational Leadership Theory (Bass & Riggio, 2008) defines a transformational leader by the impact the leader has on followers. The theory suggests transformational leaders gain respect, trust, and appreciation from the followers. The responsibility of leading complex teams is challenging. Leadership of nursing teams is a
massive responsibility and requires substantial leadership skills focusing not only on individual followers but also on the team as a whole. The complexity of healthcare and the nursing profession, along with the emphasis on infallible patient safety, requires extraordinary leadership capabilities. The complexity of nursing practice requires all RNs to understand the concepts of leadership as various leadership roles emerge in unit-based teamwork, including coordination of entire team (manager), coordination of daily activities (facilitator) and coordinator and delegator of patient care (RN) roles.

**Key Finding Seven: The critical nature of teamwork in healthcare has been established in healthcare literature. However, multiple barriers to nursing teamwork exist. The nursing community struggles to execute teamwork in an effective manner.**

**Results.** Introducing the topic of barriers to teamwork sparked an emotional response as participants appeared eager to talk about the frustrations preventing them from achieving top team performance. Findings in both quantitative and qualitative data indicate that communication failures are a key barrier to effective teamwork. This issue has been a long-standing barrier to safety in healthcare and has been documented in the literature. Schaefer et al. (1994) suggested that 70-80% of healthcare errors are associated with poor team processes such as ineffective collaboration. One decade later, Page (2004) verified that minimal progress has been made and reinforced that interpersonal communication failures occurring within the healthcare team continue to be a primary factor in errors (Page, 2004). One recent article produced by Healthgrades (2012) reported that hospitals with the highest patient ratings in nursing communication on average have fewer patient safety events. The report further indicated that 27% more patient safety events occurred in hospitals performing in the bottom 10% for nursing
communication compared to the top 10%. Thus, the importance of seeing poor communication as a barrier to teamwork cannot be understated.

One barrier to teamwork in an acute care medical-surgical hospital setting is the reality of 24-hour responsibility. The need to coordinate care over a 24-hour period results in inter-shift conflict. This type of conflict has been a historical pattern within nursing teams. Descriptions of the conflict between shifts go beyond simple interpersonal interactions and take on the character of an ongoing feud with power struggles and territoriality. Although inter-shift conflict was the lowest performing question on the survey and focus group participants were animated as they described inter-shift conflict, the focus group participants appeared resigned to the fact that this is “the way of life,” negated the possibility that the inter-shift conflict may be a root cause of poor outcomes, and appeared unmotivated to devote energy to improving shift-to-shift collaboration.

The focus group participants provided additional insight into areas they believed to be barriers to effective teamwork. The issue of avoidance of conflict is addressed separately in Key Finding 8. The data also provided one finding for UAP team members who indicated that team members fail to know when another team member needs assistance before that person asks for it. Other identified barriers are complex issues including assignment of 12-hour versus 8-hour shifts, primary care delivery model, lack of understanding of roles, workload and staffing, lack of complete trust in team members, and stress.

**Interpretations.** Various complex barriers to nursing teamwork exist. In an effort to achieve the goal of improving patient outcomes, the entire nursing team must
work together to mitigate and attempt to eliminate these barriers. Discussion of the barriers specific to individual units may provide the opportunity for targeted interventions designed to improve teamwork. Although the entire team has responsibility for improving team processes and communication, unit leadership shares a large piece of the burden related to staffing patterns, choosing a care delivery model, workload, addressing conflict, clearly identifying roles, holding staff members accountable, maintaining an attitude appropriate to the workplace, and meeting expectations of employment.

**Key Finding Eight: Nursing team members avoid conflict within the team.**

**Results.** Both quantitative and qualitative data indicate that avoidance of conflict within nursing teams is a concern to be addressed. Focus group members described the impact a single negative team member has on the entire team, indicating that a single negative individual can undesirably impact the outcomes of the entire team. In addition, two of the lowest performing questions on the NTS dealt with conflict avoidance. Of critical importance is that several of the issues related to conflict within the team structure demonstrate a correlation to outcomes. These relationships include: team members avoid conflict and occurrence of pressure ulcers; RNs and UAPs work well together and occurrence of CAUTI; members work together and occurrence of unassisted falls; team members value, seek, and give each other constructive feedback and occurrence of CAUTI; intra-shift teamwork and unassisted falls.

**Interpretations.** Transformational teamwork is dependent upon the ability of the team to effectively deal with conflict arising within the team. Individual team members who are a constant source of conflict impede the work of the team. Improved understanding of the antecedents and cause of conflict as well as of appropriate
methodology and interventions to deal with conflict may provide a major positive step in improving teamwork.

The findings coincide with prior research that demonstrated conflict in nursing teams is common (Hesketh et al., 2003; Koloroutis, 2004; Warner, 2001). In addition, nursing peer conflict was rated as a source of great stress for nursing team members (Almost, Doran, McGillis, & Spence Laschinger, 2010). Constant interpersonal conflict resulted in a reduction of teamwork efficiency (Spector & Jex, 1998; Curseu, 2011). The importance of the issue rests in the findings that healthy workplace environments benefit organizations and teams through issues such as decreased absenteeism, improved productivity, and reduction in adverse outcomes (Aldana, 2001; USAHRQ, 2003).

Dealing with conflict is the role of all team members. Although the managers of teams have a critical role in dealing with conflict, all members of the team need to acquire skills to deal with conflict and improve team relationships. Donna Wright, in Relationship-Based Care: A Model for Transforming Practice (as cited in Koloroutis, 2004), aptly described the issue of conflict within nursing teams and the associated consequences of unaddressed conflict. “If gone untended, these conflicts can evolve into toxic patterns of behavior which can completely undermine the capacity of teams to provide effective care” (p. 93). Teaching and assisting nursing teams to resolve conflict is vital to the success of teamwork.

**Key Finding Nine: The data regarding the educational needs of nursing team members provide some inconsistent findings.**

**Results.** What is the gap in educational preparation to support nursing team members performing in a team environment? Although the nature of nursing work
requires individuals become skilled at teamwork, the formal education of nurses may be relatively void of that essential learning. Data, as collected regarding the educational needs of nursing team members, lack consistency. Qualitative data indicate that Registered Nurses report some but limited formal education regarding teamwork in their educational programs. Quantitative data suggest some concepts of teamwork were minimally taught in the “leadership” portions of the RN curricula. Non-RNs reported receiving little to no formal education regarding teamwork and limited exposure in employer sponsored programs. Despite the apparent gaps in education, participants self-reported general satisfaction regarding prior education.

**Interpretations.** The majority of participants indicated a satisfaction that prior education provided the necessary tools for successful teamwork. However, even with the knowledge at hand as perceived by participants, the majority of teams struggled to achieve highly functioning status. This is evident by the finding that no team achieved a mean score of “highly satisfied” or within the range of 4.0 to 5.0 on any single question or construct, leading to several questions for further exploration.

1. If participants have been educated satisfactorily regarding teamwork, the importance of teamwork, and how to achieve teamwork that transforms nursing practice and outcomes, why are the teams failing to achieve excellence in teamwork as self-rated by their members?

2. Are team members able to provide an unbiased response to whether additional education is needed? Is it possible the nursing staff members “do not know what they do not know?” Is there a reluctance or unwillingness to attend educational seminars that may have influenced the
response to the question regarding satisfaction with prior education regarding teamwork?

3. Is there a best practice methodology available to hardwire the concepts learned in teamwork education and to incorporate teamwork concepts into the culture of the nursing unit? How do we transpose teamwork education into practice?

The results of the survey provide the impression that education has not resulted in changes in practice. Individuals who self-reportedly know and understand the importance of teamwork have not transposed the theory into daily practice. It is, therefore, apparent that simply attempting to make improvements solely through the provision of additional education may be unsuccessful. There is a need to incorporate the concepts regarding teamwork into the core culture of the team. Unit 6 provides a prime example in that the majority of respondents are satisfied with the education received regarding teamwork, but the team is not performing at a high level of teamwork.

Although these overall conflicts regarding education will need to be addressed, several more simple and specific educational opportunities emerged from the data. Subjectively, RNs appeared to be more satisfied with the education offered to them as compared to the nursing unlicensed nursing staff. Unlicensed personnel indicated they have had little opportunity to participate in formal education on teamwork. There is an opportunity to develop curricula for these individuals to focus on their roles in the team and teamwork concepts.

The inconsistent results related to education about teamwork may be related to the participants’ limited understanding or definition of teamwork as “related to completion of
tasks.” Nurses who believe teamwork to be limited to “the completion of tasks” may not recognize the need for additional education regarding the broader aspects of teamwork.

Conclusions

Conclusion One: Although statistical evidence has been discovered that a relationship exists between nursing teamwork in an acute care medical-surgical environment and nurse-sensitive quality outcomes, the direct impact of nursing teamwork on nurse-sensitive patient outcomes has not been fully determined.

The research study was designed to answer the question, “How does nursing teamwork affect nurse-sensitive patient outcomes?” The researcher also examined “Which dimensions (constructs) of teamwork are associated with positive nurse-sensitive patient outcomes?” Anecdotal evidence indicates nursing team members recognize the value of teamwork as it related to patient outcomes, specifically to the outcomes of falls, pressure ulcers, and CAUTI. Furthermore, the clinical significance of the relationship is substantial on both personal and organizational levels. Statistically significant relationships were demonstrated between nursing teamwork and patient outcomes of falls, pressure ulcers, and CAUTI. However, the research methodology and limitations of the study prevent generalizability of the findings and do not imply cause and effect. Additional evidence related to team performance is warranted to improve patient safety and decrease negative patient outcomes.

Conclusion Two: The nursing profession lacks a standard theoretical model of team performance.

An effective team in nursing practice has not been clearly defined. While many healthcare and nursing agencies address the importance of teamwork, nursing has not clearly defined quality teamwork in a consistent manner. The focus on interdisciplinary
or inter-professional teamwork is vital to the current healthcare environment.

However, a focus on teamwork inherent to the nursing sector is equally critical.

Foundational constructs for a consistent model of Transformational Nursing Teamwork are present in a variety of evidence-based practices such as Quality and Safety Education for Nurses (QSEN), Toyota Production System, and Relationship-Based Care (RBC) models. In addition, the Donabedian Model of Patient Safety, the work of Salas et al. (2009), along with the work of Kalisch et al. (2010), and the availability of the valid and reliable Nursing Teamwork Survey provide solid evidence to establish a theoretical model of teamwork unique and specific to the needs of nursing practice. The concept of establishing a “transformational team model” linked with the commonly ascribed transformational leadership model in nursing provides an opportunity to bond the concepts of effective leadership and effective teamwork together into a unifying framework targeting improvement of nurse-sensitive patient outcomes.

Conclusion Three: A number of evidence-based educational models are available for promoting effective teamwork; however, team and leadership training strategies must be further adapted to address the prerequisites and uniqueness of an acute care nursing team.

It is feasible that no currently existing model of team education can adequately be applied across all nursing practices and contexts. However, understanding the unique characteristics of the nursing unit teams will permit leaders to adapt a quality educational program to meet the needs of the nursing unit. One purpose or goal of improving teamwork in a healthcare environment is to reduce negative patient outcomes. Therefore, improved patient outcomes should be considered important measures of the effectiveness of new educational team processes. Otherwise, consuming the time, energy, and expense
of engaging in an educational process is unproductive and fruitless. Research has already identified many of the competencies necessary for effective teamwork in nursing environments, yet the research into the competencies needed for effective teamwork in an acute care nursing team and the best methodologies for promoting nursing teamwork remains in a formative stage.

In addition to the already established barriers described in general theoretical teamwork frameworks, topics to be considered include the role of both inter- and intra-shift teamwork, differing yet synchronous needs of the professional Registered Nurse and the UAP, defining roles and unique contributions of nursing team members, mitigating conflict within the team from both an inter- and intra-shift vantage, and dealing with the ever-changing membership of nursing teams. Current educational models of teamwork need to be adapted to include these important concepts in order to be effective in the nursing environment. In addition, nursing’s focus on transformational leadership and the influence of such on followers can be expanded to include the critical impact of transformational leadership on team functioning, rather than focusing solely on individual followers.

Finally, nursing education must work to include teamwork training throughout every level of education from Unlicensed Assistive Personnel (UAP) to Licensed Practical Nurses and Registered Nurses including those at the undergraduate and graduate levels. Developing an integrated model of teamwork and teamwork education will promote positive changes in everyday practice. It is also critical employers assume part of the responsibility for teamwork education and reinforcement of concepts especially for the UAP who otherwise may possibly receive no formal teamwork training.
Conclusion Four: Although it is generally accepted that most Registered Nurses will need the aptitude and skill to work in a team environment, the educational system for nurses is often void of a significant amount of instruction specifically focusing on functioning in a team environment.

Unlicensed Assistive Personnel generally rely solely on the employer to provide team and teamwork education. Thus, the responsibility for education related to working in a team environment rests with both academia and the employment sectors. The research question, “What is the gap in educational preparation to support nursing team members in performing in a team environment?” exposed a gap for both licensed and non-licensed team members. Concepts of teamwork are oftentimes “mentioned” in didactic portions of leadership or professional issues and trends courses. However, nursing graduates are not prepared for the transition from academic discussions regarding teamwork to the complexity of teamwork in real-life scenarios that confront them when employed in a nursing unit. Furthermore, multifaceted and complicated concepts such as teamwork require not only didactic and theoretical learning but also necessitate that active learning occurs through repetition, mentoring, and practice.

Teamwork requires a self-motivated choice made by each team member to collaborate with other team members in meeting the shared goals of the team. Team members must therefore relinquish personal agendas and objectives and focus on the achievements and outcomes of the team. The data suggest that this concept of team-mindedness, team orientation, and accountability to the team is difficult to achieve. In addition, all nursing team members may benefit from education, guidance, and mentoring regarding the skills for identifying, understanding, and handling conflict within the team.
Recommendations

Nursing Practice

The recommendations for nursing practice are two-fold based on short-term and long-term goals. The short-term goal takes an action-oriented research approach for the involved research site. It is recommended the eight units within the single site utilized in the study consider teamwork interventions to improve the identified weaknesses in their team structures. Reassessing the teams using the NTS or another teamwork measurement tool immediately prior to interventions and then again as a post-test evaluation may provide data to identify successes in the intervention. The pre-test data will also serve to identify the constructs requiring more targeted and intensive intervention on an individualized unit basis.

The TeamSTEPPS™ educational modules, designed by the U.S. Agency for Healthcare Research and Quality (USAHRQ), is a program designed for healthcare and may be an appropriate choice for an immediate evidence-based intervention. TeamSTEPPSTM was originally developed for work in the military services and later adapted by USAHRQ in collaboration with the US Department of Defense to improve patient safety in healthcare. The name TeamSTEPPSTM is an acronym for Team Strategies & Tools to Enhance Performance & Patient Safety. Although not designed specifically for nursing, research indicates the program has been successful in a variety of inter-professional healthcare settings. Given the lack of a tool specific to the unique needs of nursing teams, this program may offer the most suitable alternative for immediate intervention. Further investigation of the program would be warranted prior to a decision to implement.
On a more long-term and global basis, the second prong of the recommendations focus on nursing practice as a whole. It is recommended that nursing practice as a whole define and investigate the concept of Transformational Teams meaning those nursing teams that work collaboratively and effectively impact nurse-sensitive patient outcomes. Further investigation and research is required to fully understand the structure, composition, and processes of a Transformational Team in nursing and the strategies to create and sustain transformational teams and teamwork.

Using prior teamwork research from nursing and other disciplines, it is recommended nursing practice first investigate, define and then develop a single cohesive theoretical framework of Transformational Teamwork including strategies to attack the unique barriers found in nursing teams. It is possible a single philosophy and theory of teamwork may be difficult to achieve or even impractical. Each practice setting is unique and not all nursing teams function in the same manner. Therefore, it is recommended the framework be established with a triple layer of specificity and utilizes the attributes of a variety of teamwork and quality theories.

First, it is recommend a generic nursing taxonomy define nursing teamwork on a more global level and establish strategies common to the core constructs of nursing teams. The concept of “Transformational Teams” describes the author’s vision of a theory that can be designed to work in concert with transformational leadership concepts already universally accepted by nursing practice. The nursing-specific theory requires identification of the universal core competencies, nomenclature, definitions, knowledge, skills, structures, processes, and attitudes inherent in successful teamwork in the nursing domain. In addition, the teamwork theory must include the important role of the UAP
within the nursing team and the RN’s role in providing leadership at the bedside to include the UAP in team goals and understanding the team’s mental models. Because the UAP has a critical role in patient safety within the nursing team structure, the UAP requires education, training, and achievement of the skills and competencies required for safe and effective nursing care.

This first layer of the framework must be designed to be a broad description encompassing nursing in general and the various nursing specialties. Although broad concepts, these competencies of Transformational Teamwork need to be specific enough to be measurable so as to provide future evidence related to outcome measurements. The second layer of the teamwork framework addresses practice-specific needs. These more highly specialized classifications build upon the core-competency taxonomy. Rather, a practice-specific taxonomy would identify the specific team competencies, structures, processes, knowledge, skill, and attitude requirements central to teamwork in a given nursing specialty such as medical-surgical or obstetrical nursing.

Finally, the third layer of specificity would be provided at the unit level. Because nursing outcomes are measured at the unit level, specific idiosyncrasies of the nursing unit may need to be identified, measured, and addressed in a teamwork theory.

Following the establishment of an accepted theoretical nursing teamwork framework and theory, an educational program specific to the unique needs of nursing teams and based on the identified constructs can be developed or adapted. The relationship between nursing team constructs and nursing-specific indicators and outcome criteria can then be better researched and established.
Nursing Leadership

Nursing leadership has a critical responsibility to foster teamwork at the unit level. The leadership responsibility for team functioning in an acute care setting occurs primarily at the unit level and involves both unit managerial staff and all Registered Nurses assigned to the unit. The leadership function may occur as part of an “official” leader’s responsibility or as part of an RN’s informal leadership role in the team. One recommendation for nursing leadership is to provide educational opportunities and support designed to improve the team-promoting leadership skills for all Registered Nurses, aimed at optimizing collaboration in the team process.

Nursing team members have defined their perception of leadership traits they believe lead to better teamwork and improved outcomes. Some of these traits may be in addition to the traits often recounted in teamwork theoretical frameworks. It is important for all nurse leaders and all registered nurses to understand the motivators and barriers to teamwork both in evidence-based theory as well as in the reality of their particular units with their specific staff.

While transformational leadership theory is widely accepted and applicable within nursing leadership, the focus of transformational leadership rests primarily on motivating individuals to engage in cooperative, goal-oriented values. Adapting the transformational leadership style to provide additional focus on the team and teamwork may prove beneficial. Several useful unit-based concepts impacting teamwork on the unit level include improving the stability of the team membership, incorporating change theory into management of the team, promoting and supporting conflict resolution skills for all team members, identifying the impact of inter-shift conflict on unit outcomes, and improving
team orientation and accountability. It is recommended that nursing leadership embrace the reciprocal influence of teamwork and leadership, recognizing the communal relationship whereby both leadership and team processes influence each other. Creating a synergy between transformational leadership and transformational teamwork theories can bring congruence to the management of a nursing team with the potential to impact patient outcomes.

Last, one of nursing leadership’s most important recommendations is to develop strategies to measure and hold accountable teams and team members for the behaviors, expectations, and attitudes required for optimal team performance. Leadership alone has the responsibility to ensure individual competence within the team structure. Nursing leadership needs to develop a system to measure and hold accountable each team member for the personal mastery of the knowledge, skills, and attitudes required for optimal team functioning.

**Nursing Education**

The primary recommendation for nursing education is to develop a comprehensive team educational program specific to the needs of acute care nursing. Although the nurses’ ability to work within a team environment appears to be a critical factor in improving quality outcomes, formal training in teamwork has been somewhat absent in both nurse education programs and on-the-job training curricula. It should be ensured that nurses are educated to work effectively in the current delivery systems. The needed curricula is multifaceted and includes several dimensions, including teamwork concepts for all staff, key leadership strategies for Registered Nurses with conflict resolution, teamwork concepts for UAP, and the development of leadership skills and
attributes to promote teamwork and positive patient outcomes. The research provides a foundation for these key elements.

It is recommended the responsibility for teamwork education is shared equally by academia and nursing practice. Effective teamwork requires the acquisition of skills and competencies such as team orientation, collaboration, leadership, and the ability to work within a diverse environment. Future emphasis must be placed on incorporating the concepts of teamwork both within all levels of nursing program curricula and on-the-job continuing education.

The recommendation for academia is to develop a curriculum that builds from the undergraduate (basic) through graduate levels where teamwork and the development of critical leadership skills required to lead a team are included in both didactic and clinical components of education. Due to the complexity of teamwork, didactic training alone may be insufficient to achieve learning objectives and competence. A more optimum teaching strategy will combine didactic education along with active learning strategies aimed at the development and practice of clinical teamwork competencies.

Employers have several responsibilities to provide additional active learning both for UAP and nurses within the organization. Teamwork can be threaded into new employee orientation programs as well as Nurse Residency Programs where real-life case scenarios can be explored. Employers have the primary responsibility of fostering teamwork in the UAP who may have had no prior exposure to concepts of teamwork. In addition, the use of a peer-evaluation process commonly employed by acute care nursing units may provide valuable feedback for continual growth and development in the area of teamwork. Possible beneficial areas for education are included in Table 22.
Table 22

Potential Educational Topics of Benefit Based on Research Findings

<table>
<thead>
<tr>
<th>Educational Topic</th>
<th>Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>General teamwork curricula</td>
<td>all staff, focus UAP</td>
</tr>
<tr>
<td>Definition of comprehensive nature of teamwork (more than tasks)</td>
<td>all staff</td>
</tr>
<tr>
<td>Conflict management – dealing with conflict within the team</td>
<td>all staff</td>
</tr>
<tr>
<td>Changing membership theory. Team and change theory. Organizational Management</td>
<td>all staff and leadership</td>
</tr>
<tr>
<td>Identified teamwork gap – Improving Team Orientation</td>
<td>all staff</td>
</tr>
<tr>
<td>Identified teamwork gap – Team Decision-making</td>
<td>all staff</td>
</tr>
<tr>
<td>Further investigation of the successful implementation of the Toyota Production System Principles in healthcare settings</td>
<td>all staff</td>
</tr>
<tr>
<td>Teamwork leadership skills</td>
<td>all RNs</td>
</tr>
</tbody>
</table>

Future Research

Additional research is recommended with a focus on defining the unique aspects of nursing teamwork and the relationship of those components to nurse-sensitive patient outcomes. The goal of future research is to better define and understand a theoretical concept of Transformational Teams in nursing as previously described. Additional research is recommended for the purpose of the identification of teamwork competency requirements consistent with the unique properties of nursing teams as a whole as well as the development of subsequent evidence-based educational programs specific to teamwork in nursing.

Due to the limitations of the current study, it is recommended that replication research be conducted on a larger scale, with multisite sampling to determine with greater
certainty the nature of the associations between nursing teamwork and nurse-sensitive indicators. In addition, it is recommended a collection of data in a root cause analysis format be performed to identify the role of teamwork when negative nurse-sensitive outcomes occur. Research can also be expanded to include additional nurse-sensitive outcomes. Other areas for exploration include the role of team stability and changing team membership on performance metrics.

**Summary**

The findings of this study support the proposition that nursing teamwork is a critical factor in promoting quality nursing care in an acute care medical-surgical inpatient setting. This research supports a belief that the presence or lack of teamwork may impact the occurrence of nurse-sensitive patient outcomes. The data analysis provided a more comprehensive view of teamwork within the nursing environment and provides evidence to support the critical need to invest in improving nursing teamwork for the benefit of patients, nurses, and the healthcare organizations.

Although nurses in an acute care setting work in a team environment, the quality of teamwork varies from one nursing team to another, with teams often falling short of providing high-quality teamwork among members and shifts. By analyzing the relationships between the quality of teamwork at the unit level and the occurrence of NDNQI outcomes of falls, pressure ulcers, and CAUTI, nurse leaders and educators can target quality improvement interventions at the unit level. The presence of high-quality Transformational Teams in nursing may result in higher levels of quality care and fewer negative outcomes for patients, providing a substantial impact on patient recovery, patient satisfaction, and organizational financial metrics.
The current nursing environment demands teamwork and requires that all nursing team members have both an intellectual and practical understanding of teamwork. Research in other disciplines has provided evidence that team training is effective for improving performance. Theoretically, evidence was created to support further investigation into creating a standardized model of nursing teamwork, incorporating the unique needs of the acute care nursing community with the goal of improving patient outcomes and eliminating negative nurse-sensitive patient outcomes.

The model of teamwork introduced and suggested by the researcher is that of Transformational Teams, which emulates and expands on the concept of transformational leadership and includes strategies to enhance those aspects of teamwork that directly impact patient outcomes. Educational and leadership strategies aimed at promoting transformational teamwork have the potential to provide critical improvements in patient outcomes.
List of References


Vogus, T. J., & Sutcliffe, K. M. (2007). The impact of safety organizing, trusted leadership, and care pathways on reported medication errors in hospital nursing units. Medical Care, 45, 997-1002.


Appendix A: Literature Review Map

**Literature Review Map**

What is the relationship between nursing teamwork and patient outcomes?

Key terms: nursing team, teamwork, barriers, nurse-sensitive, patient outcomes, education, and leadership.

**History and Significance**

**The Relationship of Nursing Teamwork and Patient Outcomes**

- Interdisciplinary Teamwork
  - Knaus, Draper, Wagner, and Zimmerman, 1986
  - Katzenbach and Smith, 1993
  - Shulman, 1996
  - Dunton, Gajewski, Klaus and Pierson, 2007
  - Kalisch and Lee, 2009
  - Bagg, et al., 1999
  - Clark, 2009
  - Dunton, Gajewski, Klaus & Pierson, 2007
  - Manoljovich, Bamsteiner, Bolton, Dick, & Saint, 2008
  - Sargenor, Bikes, & Corwin, 2003

- Nursing Teamwork in Speciality Areas
  - Catchpole, Mishra, Hirda, & McCulloch, 2008
  - Clark, 2009
  - Reader, Flin, Mearns, & Cuthbertson, 2009
  - Kaisi, Johnson and Kirschbaum, 2003
  - Dunton, Gajewski, Klaus & Pierson, 2007

- Nursing Teamwork in Acute Care
  - Kalisch and Lee, 2009
  - Kalisch, Lee And Salas, 2009
  - Kalisch, Curley and Stafano, 2007
  - IOM, 2004
  - The United States Bureau of Labor Statistics, 2010
  - Boyle, 2004

**Barriers to Effective Nursing Teamwork**

- General Barriers
  - Andreazza, 2010
  - Oelke, White, Beamer, Doran, McGillis, and Giovannetti, 2008
  - Kalisch and Begeny, 2005

- Staff Turnover
  - Force, 2005
  - Cullen, 1999

- Non-supportive Environment for New Nursing Graduates
  - Kovan, Brewer, Greene, & Fairchild, 2009

- Lateral and Horizontal Violence
  - Rowell, 2010
  - IOM, 2004

- Gaps in Literature
  - Nursing Teams and Nurse-Sensitive Patient Outcomes
    - Acute Care
    - Medical Surgical Nursing Units
    - Roles of Nursing Education, Nursing Leadership, Research, and Practice

**Roles of Nursing Leadership and Education in Promoting Teamwork in Nursing Practice**

- Flin, Winter, Sara, & Raduma, 2010
- Hofmann & Morsgen, 2004
- Botwinick, Bisognano & Hardaden, 2006
- Rathert and Fleming, 2008
- Vogus and Sutcliffe, 2007
- Yang, Wang, Chang, and Huang, 2009
- Fullan, 2004
- Bass, 1998
- Burns, 1978
- Dunham, 2000
- Dixon, 1999
- Dunham-Taylor , 2000
- Mc Folden, Henegan and Gowen, 2009
- Vogus and Sutcliffe, 2007
- Rathert and Fleming, 2008
- Sullivan, 2010
- Andersen, Jensen, Liperti, and Bnegaard, 2011
- Kliger et al. 2010

**Proposed Study**

Transformational Teams: The Relationship of Nursing Teamwork to Patient Outcomes

Note: Due to space limitations, not all references are included
Appendix B: Measured Constructs of Teamwork

Five Measured Constructs of Teamwork (Subscales of the Nursing Teamwork Survey)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Leadership</td>
<td>The direction and support provided by a formal leader (e.g., charge nurse) or members of the team.</td>
</tr>
<tr>
<td>Team Orientation</td>
<td>An emphasis is on what is in the best interest of the total team, rather than the desires of individual team members.</td>
</tr>
<tr>
<td>Backup</td>
<td>Actions that team members take to assist when another team member is overwhelmed or does not know how to complete the work.</td>
</tr>
<tr>
<td>Shared Mental Model</td>
<td>When members have the same conceptualization about what work is to be completed and when and who will do it.</td>
</tr>
<tr>
<td>Trust</td>
<td>Confidence in team members that they will complete their part of the work in a quality manner.</td>
</tr>
</tbody>
</table>

(Source: Kalisch, Lee, & Salas, 2010)
# Appendix C: Research Questions and Methodology

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Research Methodology</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>How does nursing teamwork affect nurse sensitive patient outcomes?</td>
<td>Primarily Quantitative; Also Qualitative</td>
<td>NTS Survey Questions (all)</td>
</tr>
<tr>
<td>What is the variability in teamwork constructs across medical-surgical nursing units?</td>
<td>Quantitative</td>
<td>NTS Survey Questions (all)</td>
</tr>
<tr>
<td>What patterns exist across medical surgical nursing teams when comparing teamwork constructs and patient outcomes?</td>
<td>Quantitative</td>
<td>NTS Survey Questions (all)</td>
</tr>
<tr>
<td>Which dimensions (constructs) of teamwork are associated with nurse-sensitive patient outcomes?</td>
<td>Quantitative</td>
<td>NTS Survey Questions (all)</td>
</tr>
<tr>
<td>What descriptors do nursing team members use to define high quality teamwork?</td>
<td>Qualitative</td>
<td>Focus Group Questions 1, 2</td>
</tr>
<tr>
<td>What are the leadership traits which nursing team members identify as qualities that promote nursing teamwork</td>
<td>Qualitative</td>
<td>Focus Group Questions 8</td>
</tr>
<tr>
<td>What barriers of teamwork are identified by nursing team members working in a team environment?</td>
<td>Qualitative</td>
<td>Focus Group Questions 2, 9</td>
</tr>
<tr>
<td>How do nursing team members describe the impact of teamwork on patient outcomes of falls, pressure ulcers and CAUTI?</td>
<td>Qualitative</td>
<td>Focus Group Questions 2, 3, 5</td>
</tr>
<tr>
<td>What is the gap in educational preparation to support nursing team members in performing in a team environment?</td>
<td>Primarily Qualitative; Also Quantitative in survey.</td>
<td>Focus Group Questions 6, 7 Demographic section of survey questions 13and 14.</td>
</tr>
</tbody>
</table>
Appendix D: Nursing Teamwork Survey

Section 1: NURSING TEAMWORK SURVEY

Prior to completion of the survey, please read all accompanying information (informed consent form) regarding the research project, including risks and benefits of participation. Completion and return of this survey to the researcher implies your consent to voluntarily participate in this section of the research project.

Please fill in all the following items regarding YOUR NURSING TEAM. Please answer all questions – do not leave any questions blank.

Team is defined as the group of people working on a patient care unit (or a section of a unit such as a wing) including nurses, nursing assistants/aides/techs and unit clerks/secretaries. It does NOT refer to individuals who visit the unit such as pharmacists, physicians, physical therapists etc.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Rarely of the time</th>
<th>25% of the time</th>
<th>50% of the time</th>
<th>75% of the time</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) All team members understand what their responsibilities are throughout the shift.</td>
<td></td>
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<tr>
<td>2) The nurses who serve as charge nurses, team leaders, or facilitators monitor the progress of the staff members throughout the shift.</td>
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<tr>
<td>3) Team members frequently know when another team member needs assistance before that person asks for it.</td>
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<tr>
<td>4) Team members communicate clearly what their expectations are of others.</td>
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<tr>
<td>5) Team members ignore many mistakes and annoying behavior of teammates rather than discussing these with them.</td>
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<tr>
<td>6) When changes in the workload occur during the shift (admissions, discharges, patients’ problems etc.), a plan is made to deal with these changes.</td>
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<tr>
<td>ITEM</td>
<td>Rarely</td>
<td>25% of the time</td>
<td>50% of the time</td>
<td>75% of the time</td>
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<tr>
<td>7) Team members know that other members of their team follow through on their commitment.</td>
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<tr>
<td>8) The nurses who serve as charge nurses, team leaders, or facilitators balance workload within the team.</td>
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<tr>
<td>9) My team believes that to do a quality job, all of the members need to work together.</td>
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<tr>
<td>10) The shift change reports contain the information needed to care for the patients.</td>
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<tr>
<td>11) Some team members spend extra time on breaks.</td>
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<tr>
<td>12) Team members respect one another.</td>
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<tr>
<td>13) When a team member points out to another team member an area for improvement, the response is often defensive.</td>
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<tr>
<td>14) Team members are aware of the strengths and weaknesses of other team members they work with most often.</td>
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<tr>
<td>15) If the staff on one shift is unable to complete their work, the staff on the oncoming shift complains about it.</td>
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<tr>
<td>16) Staff members with strong personalities dominate the decisions of the team.</td>
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<tr>
<td>17) Most team members tend to avoid conflict rather than dealing with it.</td>
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<tr>
<td>18) Nursing assistants and nurses work well together as a team.</td>
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<tr>
<td>19) The nurses who serve as charge nurses, team leaders, or facilitators are available and willing to assist team members throughout the shift.</td>
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<tr>
<td>20) Team members notice when a member is falling behind in their work.</td>
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<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>Rarely</td>
<td>25% of the time</td>
<td>50% of the time</td>
<td>75% of the time</td>
<td>Always</td>
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<tr>
<td>21) When the workload becomes extremely heavy, team members pitch in and work together to get the work done.</td>
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<tr>
<td>22) Feedback from team members is often judgmental rather than helpful.</td>
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<tr>
<td>23) My team readily engages in changes in order to make improvements and new methods of practice.</td>
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<tr>
<td>24) Team members readily share ideas and information with each other.</td>
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<tr>
<td>25) Team members clarify with one another what was said to be sure that what was heard is the same as the intended message.</td>
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<tr>
<td>26) Team members are more focused on their own work than working together to achieve the total work of the team.</td>
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</tr>
<tr>
<td>27) The nurses who serve as charge nurses, team leaders, or facilitators give clear and relevant directions as to what needs to be done and how to do it.</td>
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</tr>
<tr>
<td>28) Within our team, members are able to keep an eye out for each other without falling behind in our own individual work.</td>
<td></td>
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</tr>
<tr>
<td>29) Team members understand the role and responsibilities of each other.</td>
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<tr>
<td>30) Team members willingly respond to patients other than their own when other team members are busy or overloaded.</td>
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<tr>
<td>31) Team members value, seek and give each other constructive feedback.</td>
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<tr>
<td>32) When someone does not report to work or someone is pulled to another unit, we reallocate responsibilities fairly among the remaining team members.</td>
<td></td>
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<tr>
<td>33) Team members trust each other.</td>
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</tbody>
</table>
Section II: Please provide the following demographic information:

1. Highest education level:
   1. _____ Grade school
   2. _____ High School Graduate (or GED)
   3. _____ Associate degree graduate
   4. _____ Bachelor’s degree graduate
   5. _____ Graduate degree

2. If you are a nurse, what is your highest degree:
   1) _____ LPN Diploma
   2) _____ RN Diploma
   3) _____ Associate’s degree in nursing (ADN)
   4) _____ Bachelor’s degree in nursing (BSN)
   5) _____ Bachelor’s degree outside of nursing
   6) _____ Master’s degree (MSN) or higher in nursing
   7) _____ Master’s degree or higher outside of nursing

3. Gender: _____ Female  _____ Male

4. Age:
   1) _____ Under 25 years old (<25)
   2) _____ 25 to 34 years old (25-34)
   3) _____ 35 to 44 years old (35-44)
   4) _____ 45 to 54 years old (45-54)
   5) _____ 55 to 64 years old (55-64)
   6) _____ Over 65 years old (65+)

5. Job Title/Role:
   1) _____ Staff Nurse (RN)
   2) _____ Staff Nurse (LPN)
   3) _____ Nursing Assistant (e.g., nurse aides/tech/ CNA)
   4) _____ Nurse manager, assistant manager (e.g. administrators on the unit)
   5) _____ Unit Clerk/Secretary
   6) _____ Other [Please specify: __________________________]
6. Number of hours usually worked per week (check only one)
   1) _____ less than 30 hours per week
   2) _____ 30 hours or more per week

7. Work hours (check the one that is most descriptive of the hours you work)
   1) _____ Days (8 or 12 hour shift)
   2) _____ Evenings (8 or 12 hour shift)
   3) _____ Nights (8 or 12 hour shift)
   4) _____ Rotates between days, nights or evenings

8. Experience in your role (RN, Aide, unit secretary etc.): 
   1) _____ 6 months or less
   2) _____ Greater than 6 months, but less than 2 years
   3) _____ Greater than 2 years, but less than 5 years
   4) _____ Greater than 5 years, but less than 10 years
   5) _____ Ten years or more.

9. Length of time worked on your current patient care unit:
   6) _____ 6 months or less
   7) _____ Greater than 6 months, but less than 2 years
   8) _____ Greater than 2 years, but less than 5 years
   9) _____ Greater than 5 years, but less than 10 years
  10) _____ Ten years or more.

10. Which shift do you most often work?
    1) _____ 8 hour shift
    2) _____ 10 hour shift
    3) _____ 12 hour shift
    4) _____ 8 hour and 12 hour rotating shift
    5) _____ Other [Please specify: ___________________________ ]
Please check one response for each question:

<table>
<thead>
<tr>
<th></th>
<th>Very satisfied</th>
<th>Satisfied</th>
<th>Neutral</th>
<th>Dissatisfied</th>
<th>Very dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. How satisfied are you with the level of nursing teamwork between shifts on this unit (i.e. the teamwork from one shift to the next)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. How satisfied are you with the level of nursing teamwork within a single shift on this unit (i.e. individuals working as a team within the same shift)?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13. How satisfied are you that your formal education (schooling) prepared you to work in a team environment?</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>14. How satisfied are you that the continuing education provided by your employer has assisted you to work in a team environment?</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Thank you for participating in the survey: Here are the instructions for participation in the participation prize drawing: Because we wish to maintain your anonymity, we will have no method to track your participation in this survey. Thus, we need to create a method of determining a winner of the participation prize, a $100 gift card.

Directions: In the space provided, below, create a secret codename for yourself. This can be any sort of word, number, name or phrase that you will remember and would be associated only with you. This codename will be entered in the drawing. In the second space provided below, also provide a secret password. Write down your codename and password so that you will recall them later. Do not share the codename or password with anyone else. Following the due date for the surveys, a drawing will take place from all codenames. Four codenames will be selected to be the winners of the gift cards. The winning codename will be sent to all invited participants by email and posted on all participating nursing units. If your codename is
selected, you will need to verify your identity by providing your password in order to claim the prize.

Your codename is: __________________

Your password is: ___________________

THANK YOU FOR YOUR PARTICIPATION!

The Nursing Teamwork Survey was developed and tested by B. J. Kalisch, H. Lee, and E. Salas. Permission to use the tool was received from B. J. Kalisch in personal communication with D. Rahn dated May 25, 2010.
Appendix E: Focus Group Protocol

Focus Group Interview Questions and Associated Research Questions

The following ten scripted questions have been developed for focus group interviews.

1. Discuss your personal definition of nursing teamwork. How would you define nursing teamwork and what do you believe are the primary concepts of nursing teamwork? (Associated research question: What descriptors do nursing team members use to define high quality teamwork?)

2. Describe an effective team to which you have belonged during your nursing career. What did that team look like? How were decisions made? What qualities made this team successful? Describe the interactions of this team. Describe the outcomes of this team (What did you accomplish?). Contrast this with a lower or poorly functioning team to which you have belonged. (Associated research questions: How do nursing team members describe the impact of teamwork on patient outcomes of falls, pressure ulcers and CAUTI? What descriptors do nursing team members use to define high quality teamwork? What barriers of teamwork are identified by nursing team members working in a team environment?)

3. Describe why you do or do not believe that nursing teamwork is important to patient outcomes and the provision of quality and safe patient care. (Part a: In your opinion, is nursing teamwork important to the provision of high-quality and safe patient care? Part b: Describe why or why not.) (Associated research question: How do nursing team members describe the impact of teamwork on patient outcomes of falls, pressure ulcers and CAUTI?)

4. Teamwork occurs both between shifts (shift to shift) and within a particular shift (individuals working the same shift). Which if any of the two forms of teamwork is most important to quality patient outcomes? Why? Which of the two forms of teamwork is most difficult to achieve? Discuss your experiences with each type of teamwork. (Associated research questions: What descriptors do nursing team members use to define high quality teamwork? What barriers of teamwork are identified by nursing team members working in a team environment?)

5. Rate the role of nursing teamwork as you believe it relates to the following nursing outcomes. A “1” indicates your belief that there is minimal or no relationship between teamwork and the outcome. A rating of “10” indicates a direct and positive relationship between teamwork and the outcome. Following the rating, describe your reason(s) for providing that rating.
a. Patient falls,
b. Formation of pressure ulcers
c. Nosocomial bladder infections related to indwelling catheterization.

(Associated research question: How do nursing team members describe the impact of teamwork on patient outcomes of falls, pressure ulcers and CAUTI?)

6. Describe the formal education, if any, that you received related to teamwork (i.e. What formal education did you receive related to nursing teamwork in your generic RN program, BSN program?) (Associated research question: What is the gap in educational preparation to support nursing team members in performing in a team environment?)

7. Describe any orientation or formal on-the-job education that you received related to working within a nursing team. (Associated research question: What is the gap in educational preparation to support nursing team members in performing in a team environment?)

8. Leadership - What do you perceive (if anything) as the manager/leadership’s role in promoting nursing teamwork? Has your manager ever discussed the importance or expectation of teamwork with you either individually or in a staff meeting? (describe) How does your nurse manager promote teamwork within your nursing unit? How does your manager support teamwork? What sorts of interventions would you like to see your manager provide to increase nursing teamwork on your unit? Does your team have a shared vision? (describe). (Associated research question: What are the leadership traits that nursing team members identify as qualities which promote nursing teamwork?)

9. Past data collected about teamwork has indicated that most individuals believe that teamwork on our nursing units needs improvement. What do you think are the barriers to effective teamwork? What barriers to teamwork have you personally witnessed or experienced? (Associated research question: What barriers of teamwork are identified by nursing team members working in a team environment?)

10. Do you have any additional information which you would like to share with me at this time related to your experiences or insight regarding nursing teamwork and patient outcomes? How does nursing teamwork affect nurse sensitive patient outcomes?
Appendix F: Informed Consent

RESEARCH PARTICIPANT INFORMED CONSENT AND PRIVACY AUTHORIZATION FORM

Protocol Title: Transformational Teams: The Relationship of Nursing Teamwork to Patient Outcomes

Application No: TRHMC 027-12

Sponsors: The Reading Hospital and Medical Center (TRHMC) and Drexel University

Principal Investigator(s):

Note: This research project is a doctoral dissertation by Debbie J. Rahn, MSN, RN, who is the current Director of The Reading Hospital School of Health Sciences. Debbie is completing her doctoral education at Drexel University. Drexel University policy dictates that Drexel University faculty be named as the PI for student research. Debbie Rahn will be the primary individual responsible for performing the research study and obtaining consent from participants.

(1) Dr. Rajashi Ghosh,

Dr Ghosh is an Assistant Professor at Drexel University
Chair of Dissertation Committee For Debbie J. Rahn,

(2) Debbie J. Rahn MSN, RN

Director, The Reading Hospital School of Health Sciences
Drexel University doctoral student
484-628-0201
debbie.rahn@readinghealth.org

NOTICE TO EMPLOYEES OF READING HEALTH SYSTEM BEING ASKED TO PARTICIPATE IN RESEARCH

You are being asked to take part in a research study. Taking part in the study is entirely voluntary. You are under no obligation to participate in research. Declining to participate should in no way affect your employment at the Reading Hospital or your relationship with your co-workers or supervisor. If you feel that you are in any way obligated to participate, please contact the Reading Hospital Institutional Review Board at 610-988-5082/5083 for assistance.
1. **What you should know about this study:**
   - You are being asked to join a research study.
   - This consent form explains the research study and your part in the study.
   - Please read it carefully and take as much time as you need.
   - Please ask questions at any time about anything you do not understand.
   - You are a volunteer. If you join the study, you can change your mind later. You can decide not to take part or you can quit at any time. There will be no penalty or loss of benefits if you decide to quit the study.
   - During the study, we will tell you if we learn any new information that might affect whether you wish to continue to be in the study.
   - Please ask Debbie Rahn (484-628-0201) to explain any words or information in this informed consent that you do not understand.

2. **Why is this research being done?**

   This research project is a dissertation study for a doctoral student (Debbie Rahn) who is completing a Doctor of Education in Educational Leadership and Management program at Drexel University, located in Philadelphia, PA.

   The purpose of this research is to examine the relationship between nursing teamwork and the occurrence of nurse-sensitive patient outcomes including pressure ulcers, falls, and urinary catheter associated infections. The long-term goal of the project is to incorporate new teamwork strategies into nursing leadership and educational practices to reduce the occurrence of negative nurse-sensitive outcomes.

   **How many people will be in this study?**

   Four hundred nursing staff members at TRHMC will be invited to participate.

3. **What will happen if you join this study?**

   The study is designed to compare concepts of nursing teamwork occurring on your nursing unit with the rate of pressure ulcers, falls, and urinary catheter
associated infections also occurring on your nursing unit. In order to obtain the data needed for this research, you will be asked to complete a survey on the topic of nursing teamwork. You will be asked to respond to questions about your personal experiences regarding the teamwork on your nursing unit. The survey will take approximately 15 to 30 minutes to complete.

If you agree to be in this study, we will ask you to do one (or both) of the following things:
1. Complete a survey about the teamwork on your nursing unit.
2. Participate in a focus group interview.

You have the choice to participate in none, one, or both activities.

**How long will you be in the study?**
The study will be completed during the time span from July 2013 through June 2014. Your maximum commitment approximated to be less than three hours. This includes the time to read and complete this consent (15 minutes), the time it takes you to complete the survey (approximated to be less than 30 minutes), and the time to participate in a focus group session (one hour). Following completion of these three tasks, your participation is complete.

Note: Not all participants will participate in the focus groups. If you wish to only complete the survey portion of the study, which is acceptable, your participation time will be approximately 30 to 45 minutes.

4. **What are the risks or discomforts of the study?**
The risks of participating in this survey are minimal.

**Completing the survey:** You will be providing your thoughts and opinions regarding the teamwork on your nursing unit. You will not be providing your name when completing the survey. Although it is possible that answers to some questions (such as your “job position” or “how long you have been working on the unit” may provide clues to your identity, the researcher is committed to maintaining strict confidentiality of all identifiable information collected in the survey. The research findings will be reported in group (aggregate) form only, meaning that no person will ever know your answers to any question on the survey. Individual nursing units will not be identified in any manner when discussing findings. Personally identifiable information and specific unit information will not be shared with Reading Hospital managers, hospital administrators, or any individuals. Thus, the risk of participation is minimal.
Participating in the focus groups: You will be asked specific questions about your experiences with nursing teamwork. You may choose to answer a question, or choose to not answer a question. You will not receive any pressure to answer any of the researcher’s questions. The researcher is committed to maintaining strict confidentiality of all identifiable information discussed in the focus group sessions. The discussions will be reported in common “themes”. The researcher will not report any discussions which would identify the persons or units providing the information. Personally identifiable information and specific unit information will not be shared with Reading Hospital managers, hospital administrators, or any individuals.

The greatest risk in this research process is that it is impossible for the researcher to guarantee strict confidence of information discussed in the focus groups. Confidentiality of focus groups discussions will be dependent upon all participants. Participants in focus groups will be provided information regarding the importance of confidentiality, and will be required to sign an agreement of confidentiality. However a breach of confidentiality by a participant cannot be controlled by the researcher. Should you become aware of a breach of confidentiality, I ask that you immediately notify Debbie Rahn who will support you in the process of resolving that situation.

5. Are there benefits to being in the study?

There are no true benefits to you for volunteering to participate in the study other than the fulfillment of knowing that you have participated in nursing research and contributed to the study’s findings.

6. What are your options if you do not want to be in the study?

Participation in the study is completely voluntary. You do not have to join this study. If you do not join, your employment at The Reading Hospital and Medical Center will not be affected.

7. Will it cost you anything to be in this study?

There is no cost to you for participation in the study.

8. Will you be paid if you join this study?

You will not be paid to participate in the study. However, to encourage participation, the researcher is providing a prize incentive to survey participants. Every individual who completes the survey will be eligible to enter a drawing for a $100.00 gift card. Four participation prizes will be awarded.
9. Can you leave the study early?
   - You can agree to be in the study now and change your mind later.
   - If you wish to stop, please tell Debbie Rahn right away.
   - Leaving this study early will not create any hardships for you.

10. How will your privacy be protected?
    
    The Reading Hospital and Medical Center has rules to protect information about you. Federal and state laws also protect your privacy. This part of the consent form tells you what information about you may be collected in this study and who might see or use it.

    Generally, only people on the research team will know that you are in the research study and will see your information. The people working on the study will collect information from you in the form of a survey and focus group. This includes your opinions about nursing teamwork on your unit. They may collect other information including your educational background and other details.

    The research team will need to see the information that you provide. Sometimes other people at The Reading Hospital and Medical Center may see your information. These include people who review the research studies.

    We cannot do this study without your permission. You do not have to give us this permission. If you do not, then you may not join this study.

    We will use and disclose your information only as described in this form and in our Notice of Privacy Practices. We try to make sure that everyone who needs to see your information keeps it confidential – but we cannot guarantee this.

    The use and disclosure of your information has no time limit. You can cancel your permission to use and disclose your information at any time. If you do cancel your permission to use and disclose your information, your part in this study will end and no further information about you will be collected. Your cancellation would not affect information already collected in this study.

11. What treatment costs will be paid if you are injured in this study?
    
    It is unlikely that any form of injury or harm will occur as a result of participation in this study. However, if you believe that you have sustained an injury or illness as a result of participation in this study, notify Debbie Rahn immediately (484-628-0201, debbie.rahn@readinghealth.org).
12. What other things should you know about this research study?
   a. What is the Institutional Review Board (IRB) and how does it protect you?

   The IRB reviews human research studies. It protects the rights and welfare of the people taking part in those studies. You may contact the IRB if you have questions about your rights as a participant or if you think you have not been treated fairly. The IRB office number is 610-988-5082. You may also call this number for other questions, concerns or complaints about the research.

   b. What do you do if you have questions about the study?

   Call the principal investigator, Debbie Rahn at 484-628-0201. You can also e-mail her at debbie.rahn@readinghealth.org. If you cannot reach the principal investigator or wish to talk to someone else, call the IRB office at 610-988-5082.

   c. What should you do if you are injured or ill as a result of being in this study?

   It is unlikely that any form of injury or harm will occur as a result of participation in this study. However, if you believe that you have sustained an injury or illness as a result of participation in this study, notify Debbie Rahn immediately (484-628-0201, Debbie.rahn@readinghealth.org).

13. What does your signature on this consent form mean?

   Your signature on this form means that:
   - You understand the information given to you in this form
   - You accept the provisions in the form
   - You agree to join the study

   In addition, by signing this form, you are agreeing to maintain confidentiality of all information that you may learn about the opinions your co-workers. If you participate in a focus group, you agree to keep all information that is discussed confidential, meaning that you will not discuss any information about the focus groups outside of the focus group setting. This means that you will not discuss any details about the individuals in attendance or their conversations with anyone at any time.

   You will not give up any legal rights by signing this consent form.
NOTE: A signed consent form is not required for participation in the survey. After reading this consent form, you may complete the survey. Your return of the anonymous survey signifies your consent to participate. A signed consent form is required to participate in a focus group.

WE WILL GIVE YOU A COPY OF THIS SIGNED AND DATED CONSENT FORM

Statement of agreement: I am agreeing to participate in the study “Transformational Teams: The Relationship of Nursing Teamwork to Patient Outcomes.” I understand the information provided in this consent form. In addition, I agree to maintain the confidentiality of all information learned in the process of participating in this study. I know that I may reverse my decision at any time, and decide to stop participating. However, I am required to maintain confidentiality of all information even if I decide to stop participating in the survey.

Signature of Participant

Date

Signature of Person Obtaining Consent

Date

Note: A copy of the signed, dated consent form must be kept by the principal investigator; a copy must be given to the participant.
Appendix G: Factor Analysis Data

Table G1

*Factor Analysis for Entire NTS Scale*

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<thead>
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<th>Component</th>
<th>Total</th>
<th>Variance</th>
<th>Cumulative %</th>
<th>Total</th>
<th>Variance</th>
<th>Cumulative %</th>
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Extraction Method: Principal Component Analysis

Table G2

*Reliability Statistics for Entire NTS Scale*

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Table G3

*Factor Analysis for Subscale Shared Mental Model*

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Extraction Method: Principal Component Analysis

Table G4

*Reliability Statistics for Subscale Shared Mental Model*

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### Table G5

**Factor Analysis for Subscale (Team Leadership)**

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<th>Initial Eigenvalues</th>
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Extraction Method: Principal Component Analysis

### Table G6

**Reliability Statistics for Subscale (Team Leadership)**

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### Table G7

**Factor Analysis for Subscale (Backup Behaviors)**

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Extraction Method: Principal Component Analysis
Table G8

*Reliability Statistics for Subscale (Backup Behaviors)*

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Table G9

*Factor Analysis for Subscale (Trust)*

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Extraction Method: Principal Component Analysis

Table G10

*Reliability Statistics for Subscale (Trust)*

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Table G11

*Subscale (Team Orientation)*

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Extraction Method: Principal Component Analysis

Table G12

*Reliability Statistics for Subscale (Team Orientation)*

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## Appendix H: Central Tendency Statistics for Intra- and Inter-shift Questions

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<tr>
<th>Question</th>
<th>Range</th>
<th>Mode</th>
<th>Median</th>
<th>Mean</th>
<th>SD</th>
<th>Var</th>
<th>Skew</th>
<th>Kurtosis</th>
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<tbody>
<tr>
<td>How satisfied are you with the level of nursing teamwork between shifts on this unit (i.e. the teamwork from one shift to the next)?</td>
<td>4</td>
<td>4</td>
<td>3.00</td>
<td>3.23</td>
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<td>-0.35</td>
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<tr>
<td>How satisfied are you with the level of nursing teamwork within a single shift on this unit (i.e. individuals working as a team within the same shift)?</td>
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<td>4</td>
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## Appendix I: Transformational Teamwork in Nursing: Codes

### Table I

**Codebook**

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<tr>
<th>Code</th>
<th>Name</th>
<th>Definition</th>
<th>Example</th>
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</thead>
<tbody>
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<td>BAR</td>
<td>Barriers to teamwork; Barriers to effective teamwork</td>
<td>Nurse describes the processes and factors inhibiting team formation or functionality.</td>
<td>“Sometimes we have a hierarchy or power struggle which hurts team collaboration.”</td>
</tr>
<tr>
<td>CHA</td>
<td>Characteristics of teamwork</td>
<td>Characteristics of an effective team identified by nurse participants. Also describes the collaborative, mutual, or shared relationship between team members or between teams and external entities.</td>
<td>“Communication is the key to effective teamwork.”</td>
</tr>
<tr>
<td>DEF</td>
<td>Definition of teamwork</td>
<td>Participants describe the definition of teamwork, what it means to them.</td>
<td></td>
</tr>
<tr>
<td>DIV</td>
<td>Diversity within a team</td>
<td>Individualized characteristics identified by nurse participants describing the variability of team members including descriptors such as age, gender, level of education, ideas, beliefs, and skill sets. Includes descriptions of the impact of individual team members (and individuality) on the functioning of a team.</td>
<td>“The most effective teams that I have been on have had a variety of ages, genders, education and skills. The diversity helps see all aspects of an issue and helps the team make better decisions.”</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Definition</td>
<td>Example</td>
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<tr>
<td>EDUC</td>
<td>Education</td>
<td>Descriptions of the concept of education (or lack of education) impacting teamwork. An individual’s formal education to concepts of teamwork which may have occurred in post-secondary, or continuing education programs. Includes statements regarding the lack of formal education regarding the topic of teamwork.</td>
<td>“I have never had any formal education related to teamwork.”</td>
</tr>
<tr>
<td>GOAL</td>
<td>Goal</td>
<td>The nurse describes the goal of teamwork. Also nurse participants describing the goal-driven or outcome-driven nature of effective teams. Descriptions of teamwork directed at meeting a common objective. Collective vision of the team to reach a target or accomplishment.</td>
<td>“If the team sees the value of a goal, and each person on the team sees the value of that goal, then the team will be better prepared to rally to the challenge of meeting that goal.”</td>
</tr>
<tr>
<td>INT</td>
<td>Interventions</td>
<td>Interventions attempted or applied by individual team members, leadership, or the group to promote teamwork</td>
<td></td>
</tr>
<tr>
<td>LEAD</td>
<td>Leadership</td>
<td>Descriptions provided by participants focusing on the nature and role of the leadership of a team. May include descriptions of leadership which promotes or inhibits teamwork.</td>
<td>The leader of the team needs to be open-minded and combine the strengths of each individual team member.”</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Definition</td>
<td>Example</td>
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</tr>
<tr>
<td>NEED</td>
<td>Need for teamwork</td>
<td>Nurse participants identify if a need for teamwork exists, and describe the need for teamwork.</td>
<td>Teamwork is critical to preventing patient falls. Every nurse needs to be paying attention to the patients, answering call bells promptly, making hourly rounds, and anticipating the needs of confused patients.”</td>
</tr>
<tr>
<td>OTCM</td>
<td>Outcomes of teamwork</td>
<td>Results that can be attributed to teamwork. Also includes comments provided by participants which connect the concepts of teamwork and patient outcomes. These relationships may describe direct or indirect, positive or negative relationships between the concepts.</td>
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</tbody>
</table>
### Table I2

**Relationship of Codes and Themes to Qualitative Research Questions**

<table>
<thead>
<tr>
<th>Qualitative Research Question</th>
<th>Code</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>What barriers of teamwork are identified by nursing team members working in a team environment?</td>
<td>Barriers to teamwork; Barriers to effective teamwork</td>
<td>Structure of teamwork</td>
</tr>
<tr>
<td>What descriptors do nursing team members use to define high quality teamwork?</td>
<td>Characteristics of teamwork</td>
<td>Hallmarks of an effective team</td>
</tr>
<tr>
<td>What descriptors do nursing team members use to define high quality teamwork?</td>
<td>Definition of teamwork</td>
<td>Structure of teamwork</td>
</tr>
<tr>
<td>What descriptors do nursing team members use to define high quality teamwork?</td>
<td>Diversity within a team</td>
<td>Structure of teamwork</td>
</tr>
<tr>
<td>What is the gap in educational preparation to support nursing team members in performing in a team environment?</td>
<td>Education</td>
<td>Structure of teamwork</td>
</tr>
<tr>
<td>What descriptors do nursing team members use to define high quality teamwork?</td>
<td>Goal</td>
<td>Hallmarks of an effective team</td>
</tr>
<tr>
<td>What descriptors do nursing team members use to define high quality teamwork?</td>
<td>Interventions with positive impact on teamwork</td>
<td>Hallmarks of an effective team</td>
</tr>
<tr>
<td>What are the leadership traits which nursing team members identify as qualities that promote nursing teamwork</td>
<td>Leadership</td>
<td>Hallmarks of an effective team</td>
</tr>
<tr>
<td>What descriptors do nursing team members use to define high quality teamwork?</td>
<td>Need for teamwork</td>
<td>Structure of teamwork</td>
</tr>
<tr>
<td>How do nursing team members describe the impact of teamwork on patient outcomes of falls, pressure ulcers and CAUTI?</td>
<td>Outcomes of teamwork</td>
<td>Outcomes of teamwork</td>
</tr>
</tbody>
</table>
Appendix J: Triangulation of Data

The purpose of the following grid is to provide a summary of quantitative and qualitative findings for the purpose of triangulation and interpretation of data. Definitions which have been based on the Drexel University Ed.D. Dissertation Handbook (2014) include:
Finding- Data
Result- Significant ideas based on synthesis of findings, patterns and trends that emerge from the findings
Interpretation – Researcher’s determination of the meaning of the results which will be used as the source of information for
Chapter Five Recommendations.
**Triangulation of Data**

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Key Finding</th>
<th>Quantitative Data</th>
<th>Qualitative Data</th>
<th>Results</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Research Question: How does nursing teamwork affect nurse sensitive patient outcomes? What patterns exist across medical surgical nursing teams when comparing teamwork constructs and patient outcomes?</td>
<td>Key Finding #1: Statistically significant relationships have been demonstrated between nursing teamwork and patient outcomes of falls, pressure ulcers and CAUTI. Correlations do not imply cause and effect.</td>
<td>Units with high scores for teamwork also had better patient outcomes (raw scores), and units with lower teamwork scores had less desirable patient outcomes. Unit 8 had high teamwork scores (Highest overall teamwork score tied with unit 6 and first or second in rank in all constructs) with zero negative findings in CAUTI, and pressure ulcers and second lowest finding for patient falls during the most recent quarter of NDNQI outcome data. Unit 2, had highest teamwork score (tied with Unit 8) and highest scores in two of five constructs with lower six quarter average raw score occurrences of negative patient outcomes in total falls, injury falls, unassisted falls, and catheter-associated urinary tract infections.</td>
<td>Intended to be pure quantitative question, however the quantitative data findings are supported by qualitative data secured from focus group participants who indicate that nurses perceive that a strong inverse relationship exists between the quality of nursing teamwork and NDNQI nurse sensitive patient outcomes of falls, pressure ulcers, and CAUTI.</td>
<td>Raw score data implied a relationship in that units with high degree of nursing teamwork as measured by NTS also have lower (better) NDNQI patient outcomes of falls, pressure ulcers and CAUTI. Correlations between NTS teamwork constructs as defined resulted in one correlation between Shared Mental Model and Falls. However, multiple statistically significant findings were noted for specific questions within the NTS as well as intra-shift teamwork and the NDNQI outcomes of falls, pressure ulcers and CAUTI. Relationships between NDNQI outcomes and specific questions within the NST may provide a more targeted approach to research recommendations.</td>
<td>Multiple inverse relationships exist between nursing teamwork and patient outcomes. Relationships and correlations do not imply causation or cause and effect. However, the clinical significance of the presence and/or improvement of negative patient outcomes is critical. The importance of this finding may add substantial knowledge regarding the role of nursing teamwork in decreasing negative patient outcomes. Highly functioning teams with high performance in quality outcome indicators are considered by researcher to be “transformational teams.” The full extent of correlation between transformational teams and NDNQI patient outcomes is yet to be determined.</td>
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**Key Outcome Findings:**

**FALLS:**

The correlational data analysis produced one team construct finding with significance. The Kendall’s Tau-b coefficient was computed to determine if there is a relationship between the teamwork
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<tr>
<th>Research Questions</th>
<th>Key Finding</th>
<th>Quantitative Data</th>
<th>Qualitative Data</th>
<th>Results</th>
<th>Interpretation</th>
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</thead>
<tbody>
<tr>
<td>construct of Shared Mental Model and Unassisted Falls.</td>
<td>$r(8) = -0.571, p &lt; .05$ (two tailed)</td>
<td>A relationship between intra-shift teamwork (researcher generated question) and unassisted falls can be documented. The two variables were strongly correlated, $r(8) = -0.618, p &lt; .05$ (two tailed).</td>
<td>Q 9: My team believes that to do a quality job, all of the members need to work together/ Unassisted Falls, $r(8) = -0.771, p &lt; .05$ (two tailed).</td>
<td>PRESSURE ULCER:</td>
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<td>Most team members tend to avoid conflict rather than dealing with it. UAPU &gt; STAGE II using mean for 6 Quarters of data $r(8) = -0.732, p &lt; .05$ (two tailed).</td>
<td>CAUTI: 6 quarter data average</td>
<td>RN and Nursing Assistants work well together. The two variables were strongly related Pearson $r(8) = -0.734, p &lt; .05$ (two tailed).</td>
<td>Q10: The shift change reports contain the information needed to care for the patients $r(8) = -0.854, p &lt; .01$ (two tailed).</td>
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<td>Research Questions</td>
<td>Key Finding</td>
<td>Quantitative Data</td>
<td>Qualitative Data</td>
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<td>• Q21: When the workload becomes extremely heavy, team members pitch in and work together to get the work done ( r(8) = -0.889, p &lt; .01 ) (two tailed).</td>
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<td>• Q26: Team members are more focused on their own work than working together to achieve the total work of the team 4th quarter 2013 data (Reverse coded) ( r(8) = -0.776, p &lt; .05 ) (two tailed).</td>
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<td>• Q28: Within our team, members are able to keep an eye out for each other without falling behind in our own individual work ( r(8) = -0.746, p &lt; .05 ) (two tailed).</td>
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<td>• Q29: Team members understand the role and responsibilities of each other ( r(8) = -0.876, p &lt; .01 ) (two tailed).</td>
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<td>• Q30: Team members willingly respond to patients other than their own when other team members are busy or overloaded ( r(8) = -0.794, p &lt; .05 ) (two tailed).</td>
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<td>• Q31: Team members value, seek and give each other constructive feedback ( r(8) = -0.725, p &lt; .05 ) (two tailed).</td>
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### Research Questions

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<tr>
<th>Key Finding</th>
<th>Quantitative Data</th>
<th>Qualitative Data</th>
<th>Results</th>
<th>Interpretation</th>
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</table>
| **Q32:** When someone does not report to work or someone is pulled to another unit, we reallocate responsibilities fairly among the remaining team members.  
$r(8) = -\ 848$, $p < .01$ (two tailed). | Variance of means and quantitative teamwork data unit to unit. Differences exist in teamwork from one nursing unit to the next. Some units higher/lower in all areas/constructs. Teamwork Units 2 and 8 – Higher means; Teamwork Unit 6 – Lower means - Unit 2 vs. Unit 6 AVOVA data indicate that Unit 2 Teamwork scores > Unit 6 Teamwork scores in (1) overall teamwork, (2) Shared Mental Model, (3) Team Orientation, and (4) Trust (all with $p < .05$). Demographics: Unit 2 > time on unit Unit 2 > % BSN | Key quantitative finding was supported in qualitative data. Qualitative findings indicate that participants describe teamwork strengths and opportunities for improvement which vary from unit to unit. Furthermore qualitative data indicates that the perspective of nursing team members is that teamwork impacts outcomes. Participants cited examples of when teamwork is working, outcomes are better. “You can tell when the teamwork is working effectively and you can tell when the teamwork is not working effectively because the NDNQI scores are definitely affected by that.” Qualitative data - not conclusive for cause and effect. | Constructs of teamwork was measured using the Nursing Teamwork Survey (Kalisch et al., 2010). Nursing units fall into one of three patterns of teamwork: high functioning in all construct areas, mixed and low functioning in all construct areas. Level of teamwork differs between units (statistical significance). | Teamwork varies unit to unit. Some teams are higher functioning as compared to others. Conceptually, lower functioning teams can learn to improve their teamwork and make improvements in team functioning. The qualitative findings also reflect the concept that teamwork within a group will vary from one time period to another which may provide future opportunity to explore the underlying causation and implications of changes in teamwork functioning and performance. Higher functioning teams are defined by researcher to be “transformational teams.” Understanding of the underlying variables impacting teamwork is not fully understood. |
<p>| What is the variability in teamwork constructs across medical-surgical nursing units? | Data in this sample indicated the aggregate ($n=154$) ranking order of constructs was as follows: Shared | Primarily quantitative data underlying this finding. Qualitative data confirms | Team Orientation may be the most difficult construct to achieve, and thus presents the | Nursing teamwork is a complex process. Looking at constructs of teamwork and specific indicators such as defined by NTS questions |</p>
<table>
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<tr>
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<th>Quantitative Data</th>
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<td>Mental Model, Team Leadership, Trust, Backup and lastly Team Orientation.</td>
<td>quantitative findings indicating that Team Orientation areas such as conflict avoidance, team decision-making, 24 hour accountability, and inter-shift teamwork and provide opportunities for improvement.</td>
<td>greatest opportunity for improvement. The greatest opportunities for improvement in teamwork addressed in the Team Orientation questions include items such as improving inter-shift teamwork, providing a process for a 24-hour plan of accountability for care rather than shift by shift, dealing with conflict within the team, team decision-making, dealing with different types of personality traits within the team, and helping individuals to be more focused on the goals of the team.</td>
<td>(rather than a broad teamwork construct as a whole) provides a clearer focus for process improvement. Findings help to define areas which may provide the greatest impact for improvement in team functioning. (See individual questions below).</td>
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<td>Team Orientation scores were lowest of the five constructs (n=154) in central tendency scales, overall mean, unit means, questions, and the lowest performer in each unit.</td>
<td>Although teamwork is defined as a complex process, some nursing team members qualitatively define teamwork as &quot;getting tasks done.&quot;</td>
<td>The demands placed on nurses during their typical workday create a limited view of teamwork as &quot;getting the tasks done.&quot; This limited definition of teamwork misguidedly creates a system whereby nurses at the end of the shift have a false sense of satisfaction equating completion of tasks with high quality nursing care. There is an opportunity to redefine teamwork in terms of a broader view. Increasing the understanding of comprehensive teamwork including team vision, goals, decision-making, problem solving, and both team and individual accountability for outcomes may be beneficial (increase Shared Mental Model and Team Orientation).</td>
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<td>Research Questions</td>
<td>Key Finding</td>
<td>Quantitative Data</td>
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<tr>
<td>What barriers of teamwork are identified by nursing team members working in a team environment?</td>
<td>Key Finding #4: The nursing team is transitory and frequently experiences change in membership.</td>
<td>Although this question was originally generated to be a descriptive qualitative question, data collected in the demographic portion of the survey provided an unexpected quantitative finding.</td>
<td>Qualitative findings support the fluidity of the teamwork process.</td>
<td>Although individuals within a nursing team may possess multiple years of experience within their role, the unit nursing team lacks member stability, and is constantly changing due to transfers between units, attrition, and the hiring of new team members. (Lack of consistent team members/ lack stability).</td>
<td>Teams defined as a constant set of individuals working interdependently for a common goal does not adequately describe the changing nature of nursing teams. Therefore, utilizing typical theoretical frameworks for teamwork functioning such as Tuckman’s (1968) model of teamwork theory (forming, storming, norming, performing) do not adequately describe the complex and fluid nature of nursing teams which are “reforming” frequently due to changes in membership. Leadership activities theoretically prescribed for the varying stages of team formation will be challenged by the transient nature of nursing teams. In order to more fully understand the impact of changing membership, nursing leadership needs to gain an understanding of the concepts of both change theory and teaming theory. Nursing can find direction from organizational behavioural theories to more clearly understand the impact of constant changing membership on team effectiveness, productivity and outcomes. (see Wageman, Gardner and Mortensen (2012))</td>
</tr>
<tr>
<td>What descriptors do nursing team members use to define high quality teamwork?</td>
<td>Key Finding #5: Nursing Team members’ descriptions of high quality teams fall into three categories including the structure, process and outcomes of the team.</td>
<td>Qualitative methodology only</td>
<td>Three themes emerged from data. Structure Theme</td>
<td>Nursing Team members’ descriptions of high quality teamwork fall into three themes including the structure, process and outcomes of the team. The three pronged description of high quality transformational</td>
<td>Nursing Team members’ aptly describe high quality teamwork as a complex continual process designed to provide quality care of patients and achieve quality outcomes. Nursing team members recognize how teamwork structure and processes lead to quality outcomes. This ability to provide in-depth analysis of high quality teamwork is in direct opposition to</td>
</tr>
</tbody>
</table>
### Research Questions

- The group must establish clear goals that are understood by all group members.
- The group is committed to working together to accomplish the established goals.
- All members of the team (Registered Nurses and UAP) understand the focus of the team, the goals, and their role in achieving the goals.
- Achievement of the goals set by the team is viewed as a priority by all team members.
- The structure of the team includes a diverse group of members. The diversity of the group provides a differing of opinions and views, as well as different strengths of each individual member. Members are assigned (or choose) roles based on individual strengths and interests. Example provided by participant – Individual interested in wound care becomes the wound resource nurse for the unit. Identify each person’s role in achieving the teamwork focuses on the patient as the central theme and mirrors the Donabedian Theory (2003).

### Key Finding

- The “teamwork means getting the tasks done” definition previously described. As previously described one possible interpretation is that the intense responsibilities placed on nursing team members on any given shift alters the focus of individuals from the achievement of team goals to the survival mode of simply “getting the tasks done” before the end of the shift.

The role of Registered Nurses and the team leadership must focus on the continual improvement of team-wide communication and engagement of all team members in the goals of the team. Engaging all members through processes such as huddles and shared governance may be first steps in successful in fostering personal commitment to the team, team goals, and high quality patient care. The role and contributions of the UAP on a team needs to be clearly defined for all members of the team.

### Qualitative Data

- Identify each person’s role in achieving the
- the “teamwork means getting the tasks done” definition previously described. As previously described one possible interpretation is that the intense responsibilities placed on nursing team members on any given shift alters the focus of individuals from the achievement of team goals to the survival mode of simply “getting the tasks done” before the end of the shift.

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### Quantitative Data

- Identify each person’s role in achieving the
- the “teamwork means getting the tasks done” definition previously described. As previously described one possible interpretation is that the intense responsibilities placed on nursing team members on any given shift alters the focus of individuals from the achievement of team goals to the survival mode of simply “getting the tasks done” before the end of the shift.

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### Results

- Identify each person’s role in achieving the
- the “teamwork means getting the tasks done” definition previously described. As previously described one possible interpretation is that the intense responsibilities placed on nursing team members on any given shift alters the focus of individuals from the achievement of team goals to the survival mode of simply “getting the tasks done” before the end of the shift.

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### Interpretation

- Identify each person’s role in achieving the
- the “teamwork means getting the tasks done” definition previously described. As previously described one possible interpretation is that the intense responsibilities placed on nursing team members on any given shift alters the focus of individuals from the achievement of team goals to the survival mode of simply “getting the tasks done” before the end of the shift.

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### Hallmarks of an Effective Team Theme

Multiple processes impact the functioning of a nursing team and the quality of teamwork. The following processes were discussed by participants:

- **Communication is the key to success**
- A variety of leadership processes requires that all RNs understand the concepts of leadership.
- Coordination of entire team (manager), coordination of daily activities (facilitator) and coordinator of patient care (RNs) roles. Role of leadership in directing all team processes.
- Collaboration
<table>
<thead>
<tr>
<th>Research Questions</th>
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<th>Qualitative Data</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>What are the leadership traits which nursing team members identify as qualities that promote nursing teamwork?</td>
<td>Key Finding #6: Team leadership is critical to the success of teamwork.</td>
<td>Qualitative Question</td>
<td>The topic of leadership was a spontaneous and energized discussion in all focus groups. Participants were very supportive of the unit leader and spoke in a positive manner about the important role that the leader plays in teamwork. Focus group participants indicated that their perception of leadership role in promoting teamwork is critical. Participants recognize the importance of the role of the team leader and look to the leader for structure and guidance through the teamwork processes.</td>
<td>Leadership role in promoting teamwork is critical. Participants recognize the importance of the role of the team leader and look to the leader for structure and guidance through the teamwork processes.</td>
<td>The participants (as team members) outlined a series of characteristics which they believe help a team to achieve success. Transformational teams require transformational leaders. Without ever actually using the term “transformational leader” the focus group participants described characteristics of leadership such as having an emphasis on helping every member of the group succeed, inspiring</td>
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<tr>
<td>Research Questions</td>
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<td>of the role of leadership in promoting teamwork included:</td>
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<td>others, concentrating on building morale rather than destroying it by use of discipline as a motivator, and working toward common goals. Bass’ Transformational Leadership Theory (Bass &amp; Riggio, 2008) defines a transformational leader by the impact that the leader has on followers. Bass suggests that transformational leaders gain respect, trust, and appreciation from the followers. The responsibility of leading complex teams is challenging. Leadership of nursing teams is a massive responsibility and not for the timid. The complexity of healthcare, the nursing profession, teams, and the emphasis on foolproof patient safety requires extraordinary leadership capabilities. A variety of leadership processes requires that all RNs understand the concepts of leadership as various leadership roles emerge in teamwork including coordination of entire team (manager), coordination of daily activities (facilitator) and coordinator of patient care (RNs) roles.</td>
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<td>• Communication - clear and relevant directions</td>
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<td>• Seeing the big picture</td>
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<td>• Coordinating</td>
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<td>• Assuring adequate staffing for the team and balancing workload</td>
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<td>• Setting expectations</td>
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<td>• Holding others accountable to the expectations</td>
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<td>• Monitor progress of the team – note problems early</td>
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<td>• Motivating the team – avoiding when possible the use of discipline as a primary motivator. Use positive reinforcement.</td>
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<td>• Deal with conflict within the team; helping team members to deal with interpersonal conflict.</td>
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<td>• Address problems quickly and thoroughly</td>
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<td>• Address issues related to “problem employees”</td>
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<td>• Stand up for staff</td>
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<td>• Reliability</td>
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<td>• Organization</td>
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<td>• Visibility on the unit</td>
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<td>• Pitches in to help during times of difficulty</td>
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<td>Some focus group quotes</td>
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<td>“Recognizing there is a problem within the team and stepping in before it becomes an issue, noticing that one person or that one group or one shift, or whatever is going in the wrong direction and steps in before it would get to the point where your Press Ganey scores are affected or moods are affected and people are affected. Somebody who recognizes it is extremely important.”</td>
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<td>“She actually between days and evenings runs huddles to keep us all informed of what is going on together. She is very involved in all of our staff meetings, shared governance. She makes her presence known and tries to arrange meetings so each shift can get to them, which is important.”</td>
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<td>“Constructive criticism and encouragement is a better format than the disciplinary approach”</td>
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<td>“To keep people motivated. They need to be able to direct people and know people’s strengths and weaknesses; and maybe realize that, and adjust the staffing accordingly such as assignments. The manager needs to be aware of that type of thing to be able to help keep that flow going and”</td>
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### Key Finding

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<td>What barriers of teamwork are identified by nursing team members working in a team environment?</td>
<td>Key Finding #7: The critical nature of teamwork to patient outcomes has been established in healthcare literature. However, multiple barriers to nursing teamwork</td>
<td>Although the identification of barriers was generated as a descriptive qualitative question, the data collected in the NTS provides information related to the</td>
<td>Participants indicated that three factors were considered barriers related to the around-the-clock nature of inpatient nursing care and shift work. 1) Varying shifts creates</td>
<td>Raising the topic of barriers to teamwork sparked an emotional response as participants appeared eager to talk about the frustrations</td>
<td>Various complex barriers to nursing teamwork exist. For the sake of improving patient outcomes, the entire nursing team must work together to mitigate and attempt to eliminate these barriers.</td>
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"I cannot speak for the rest of you, but we have all been on units at one point in time that the facilitator made the difference on how your night went. If they are able to facilitate and guide and keep the flow going, keep people moving, keep the call bells, ‘you go here, you go here’, ‘can you help out here’? That makes a huge difference, so a good leader makes a big difference in your team."

“They are very visible on the unit. They make themselves well known on the unit so I would have to say that they are more a part of our team than having to just be there to resolve issues so the issues are kind of hopefully caught sooner rather than waiting until it is a bigger problem.”

“Once we had that leadership in place and it is not necessarily that they are resolving issues, I think just, like you said, having that visibility on the unit, having the interactions with them on the unit, having structure built is incredibly helpful.”
exist. Nursing struggles to execute teamwork in an effective manner (Kalisch et al., 2010).

Question 15: Inter-shift conflict/complaints was the lowest performing question for the aggregate 33/33.

Only 68 individuals (44.1%) provided a “positive” response of either satisfied or very satisfied with the teamwork occurring between shifts. Negative dissatisfied responses were provided by 27.9 percent of participants, with the remaining 33.8% of respondents neutral to the question.

A paired t-test analysis of inter and intra-shift teamwork satisfaction data revealed a significant difference t(153) = -7.281, p< .001, with intra-shift teamwork receiving higher scores as compared to the teamwork occurring between shifts.

Question 26 was also one of the lowest performing questions in the NST (n=154). This question indicated that team members are more focused on their own work than working together to achieve the total work of the team. (qualitative data suggest the barrier is preventing them from achieving top team performance.

In healthcare, and especially in acute care hospital units, the 24-hour around the clock coordination of care adds additional challenges to a team concept. The work of the team extends moment-to-moment, hour-to-hour, shift-to-shift, and day to day. The coordination between shifts and coordinating care among all of the various team members providing care to a single patient has historically been a difficult transition in nursing, and was discussed by focus group participants.

One barrier to teamwork is the reality of 24-hour responsibility. Although inter-shift conflict/complaints was the lowest performing question on the NTS, the focus group participants appeared resigned to the fact that this is “the way of life”, negated the possibility that the inter-shift conflict may...
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<td>“too busy” with our own assignment)</td>
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<td>two individuals work 12 hour shifts back to back, the “handover process is smoother and more consistent as those two individuals become the primary “team” for that patient. Other participants indicated that when 12 hour shift workers are interspersed with 8 hour shift workers on the same unit, it causes additional chaos for coverage and changes in assignments. The change from team nursing model to a primary care model of care delivery: “I think primary nursing took away a lot of teamwork in nursing. I noticed this lately, they just changed this, that there are more hospitalists on and rounding at night so they are not called as much. I can call the hospitalist, you can call the hospitalist and she can call the hospitalist and nobody knows about it. The same way you said that nobody knows what is going on and we even found that out with the beepers. We can be having a MATT at one end of the hall and the other end doesn’t know what is going on because there is no overhead call, so unless you see everybody running, it’s like what is going on down there. You are kind of taking a lot of the teamwork away.”</td>
<td>be a root cause of poor outcomes, and appeared unmotivated to devote energy to improving shift to shift collaboration. Other identified barriers are complex issues requiring further investigation • Assignment of 12 hour shifts • Primary care delivery model • Lack of understanding of roles • Workload • Lack of trust in team members • Stress</td>
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<td>Lack of understanding of the roles of RNs and UAP. “Sometimes they (UAP) think that we just give meds all day. Walk a mile in my shoes and understand each other’s roles.”</td>
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<td>Other barriers - Workload: “We are too busy with our own assignments to help each other.” This was one of the times when the participants focused on “task completion” as the definition of teamwork. Other participants indicated that when in a true emergency (such as a weather emergency), teamwork actually improves because “we are forced to work as a team.”</td>
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<td>Each focus group discussed how a “bad attitude “of an individual team members is a barrier to successful teamwork. (see section on avoidance of conflict). One participant stated, “One person with a bad attitude known to not cooperate will throw off the whole dynamics in what you do.”</td>
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<td>Lack of trust in co-workers is a barrier: One participant stated, “Lack of trust is a barrier. If you can’t trust the other person on the team, and feel the need to keep checking up on other person (RN is accountable for the care), then you’ll just be</td>
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<td>What barriers of teamwork are identified by nursing team members working in a team environment?</td>
<td><strong>Key Finding #8</strong>: Avoidance of conflict: Nursing team members avoid conflict within the team.</td>
<td>Originally discovered as part of qualitative data collection. Researcher returned to quantitative data to triangulate with survey findings.</td>
<td>One of the topics which was discussed in all three focus groups by several focus group participants was that of conflict within the team. The recurring theme, as well as the animated tone and non-verbal behavior by participants as they discussed the topic caused the researcher to return to the survey data and perform additional analysis of the questions in the survey related to team conflict. Focus group participants indicate that team members do not have the skills to effectively deal with conflict and often avoid it or “Send it up the chain of command.”</td>
<td>Both quantitative and qualitative data indicate that avoidance of conflict within nursing teams is a concern to be addressed. Initially viewed as a qualitative question related to barriers. However, the analysis of the focus group data caused the researcher to return back to the quantitative data and investigate responses to questions specifically related to conflict. Two of the lowest performing questions deal with conflict avoidance. The</td>
<td>Transformational teamwork is dependent upon the ability of the team to effectively deal with conflict arising within the team. Individual team members who are a constant source of conflict impede the work of the team. Participants indicated that even just one person with a “poor attitude” can have a major negative affect on team cohesiveness and function. Dealing with conflict within the team is vital to sustaining a high functioning team. Improved understanding the antecedents and cause of conflict, as well as appropriate methodology and interventions to deal with conflict may provide a major positive impact in improving</td>
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<td>Conflict often remains unresolved and interferes with team function.</td>
<td>questions were reverse coded before using data for analysis.</td>
<td>Dealing with conflict is the role of all team members. Although the managers of teams have a critical role in dealing with conflict, all members of the team need to acquire skills to deal with conflict and improve team relationships (Relationship Based Care and relationships with peers).</td>
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<td>Conflict is reported in both inter-shift and intra shift teamwork.</td>
<td>Question 17: The data for question 17 indicated that this question was the second lowest performing question in the NTS. “Most team members tend to avoid conflict rather than dealing with it.”</td>
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<td>Some RN and UAP conflict exists. UAP want to feel respected by RNs, UAP also want to be “trusted” and supported that their findings are valid.</td>
<td>93% of the 154 responses indicated that the team avoids conflict.</td>
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<td>Participants report that conflict exists due to “different personalities” and employees with “attitude.” One participant stated, “Some people are not approachable, you know maybe they don’t want to hear suggestions to how to make things go a little smoother to help. Some people are there on their own agenda. They are not there for the unit, they are there just for a paycheck and go home.”</td>
<td>133/154 responses indicated that the team avoids conflict more than 50% of the time.</td>
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<td>Participants indicated that even just one person with a “poor attitude” can have a major negative affect on team cohesiveness and function.</td>
<td>The responses (as answered prior to reverse coding) and were • 7 responses for “Never” • 14 responses for “25% of the time” • 52 responses for 50% of the time” • 67 responses for “75% of the time” • 14 responses for “Always “</td>
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Question 5: Team members ignore many
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<td>What is the gap in educational preparation to</td>
<td>Key Finding #9: The data regarding the educational</td>
<td>Overall, the participants provided satisfaction scores</td>
<td>Many of the Registered Nurses indicated that they</td>
<td>Data as collected regarding the</td>
<td>Although none of the participants indicated that the education they</td>
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mistakes and annoying behavior of teammates rather than discussing these with them. This represents a lack of holding others accountable and demonstrates another form of avoiding conflict. This question was also one of the lowest performing questions in the study. Of critical importance is that several of the issues related to conflict within the team structure demonstrate a correlation to outcomes (full data presented below). Examples include:

- team members avoid conflict/pressure ulcers
- RN and UAP work well together/CAUTI
- members work together/Unassisted Falls.
- Team members value, seek and give each other constructive feedback/CAUTI
- Intra-shift teamwork/unassisted falls.
Research Questions: Support nursing team members in performing in a team environment?

Key Finding: Needs of nursing team members provides some inconsistent findings.

Quantitative Data of 3.94 for formal education and 3.74 for employer provided continuing education on teamwork. These quantitative scores indicate that the nursing staff is generally satisfied with prior education and do not self-identify a substantial gap in knowledge related to teamwork. A paired sample t-test indicated a significant difference between the satisfaction with formal education and the satisfaction with education provided by the employer, with the respondents indicating a lower satisfaction with the education provided by the employer.

Thirty-four participants indicated dissatisfaction (ratings of 1 or 2) with the formal education regarding teamwork. Eighteen participants indicated dissatisfaction with continuing education regarding teamwork.

Team 6 - Lowest performing team in teamwork constructs was not the lowest performing team related to satisfaction with education (inconsistency).

No correlations found between satisfaction with education and outcomes. No difference between RN.

Qualitative Data: have received small sections of teamwork education in various sessions such as preceptor courses, shared governance courses, facilitator courses, LEAD courses, RBC courses.

RNs participant: “It is a mystery to why we are having this absent in our training!” (study participant, personal communication, February 24, 2014).

Non-licensed comment: “I have been here almost six years and I have never received anything on teamwork from an educational standpoint until recently when they rolled out the Relationship-Based-Care (RBC). That was the only thing we have had as far as teamwork. I think people automatically assume that good people skills, communication, and personality to work with a team. Some people don’t understand what really is involved in that” (study participant, personal communication, February 24, 2014).

Results: Educational needs of nursing team members lacks consistency. Participants self-report general satisfaction regarding prior education, and fail to report a gap in education. Qualitative data indicate that Registered Nurses report some, but limited formal education regarding teamwork in their educational programs. Although the nature of the nurse’s work requires that individuals become skilled at teamwork, the formal education of nurses is relatively void of that essential learning. Data suggests that some concepts of teamwork were minimally taught in the “leadership” portions of the RN curricula. Non-RNs report receiving little to no formal education regarding teamwork, and limited exposure in employer sponsored programs.

Interpretation: received had a strong focus on teamwork, the two most noticeable gaps discussed by participants included general teamwork education for the unlicensed assistants, and more advanced teamwork skills such as understanding different personalities, problem solving in a group, and conflict management for the Registered Nurses. Subjectively, RNs appeared to be more satisfied with the education offered to them as compared to the nursing unlicensed nursing staff.

The inconsistent results related to education about teamwork may be related to the participants’ limited understanding/definition of teamwork as “related to completion of tasks.” Nurses who believe teamwork to be limited to “the completion of tasks” may not recognize the need for additional education regarding the broader aspects of teamwork.

The results may also indicate that the participants had a concern that providing an affirmative answer indicating a need for additional education may have resulted in mandatory participation as often occurs in healthcare settings.

The lack of consistent teamwork as measured in the survey (and presence of correlations to patient outcomes as described) indicates a need for additional research, education and interventions.
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<td>and Non-RN findings in satisfaction with teamwork education. (Inconsistent with qualitative data)</td>
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<td>The data provided one finding of differences between RN and Non-RN samples. Independent Samples t-test</td>
<td>QUESTION3: Team members frequently know when another team member needs assistance before that person asks for it.</td>
<td>RN Mean 3.31&lt;br&gt;Non RN mean 2.74&lt;br&gt;Levene's Test for Equality of Variances&lt;br&gt;F 5.133, p &lt; .05&lt;br&gt;T, 3.048 p &lt; .01</td>
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<td>Possible beneficial areas for education&lt;br&gt;• General teamwork curricula (all staff, but especially with non-RN staff). Definition of comprehensive nature of teamwork (more than tasks) - All staff&lt;br&gt;• Conflict management - dealing with conflict within the team (all staff)&lt;br&gt;• Changing membership theory. Team and change theory. Organizational Management (All staff and leadership)-&lt;br&gt;• Identified teamwork gap – Improving Team Orientation&lt;br&gt;• Identified teamwork gap – Team Decision-making&lt;br&gt;• Definition of comprehensive nature of teamwork (more than tasks) - All staff.&lt;br&gt;• Further investigation of the successful implementation of the Toyota Production System Principles in healthcare settings.</td>
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