Does Education Matter?

Nurse Manager Leadership Style and Clinical Nurse Empowerment and Perceptions of Culture of Safety

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Abstract

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Nurse managers are essential in providing safe and effective patient care. The nurse manager position is a professional role necessary for the overall success of a hospital, clinic, or home health agency. The national education minimum for the initial entry to practice for registered nurses in the United States varies from diploma-training school to collegiate education at Associate, Bachelor, and Masters levels. Other professional healthcare workers need a Doctoral degree upon entry into practice. Nurse managers who lead multidisciplinary teams of other professionals are not required to achieve higher academic credentials in the United States beyond the initial entry to practice minimum. This study examined the relationships among nurse manager education levels, leadership style, and empowerment. It explored how the nurse managers' levels of education and empowerment correlate to the patient safety chain of transformational leadership that leads to a safety culture. Additionally, the variable Magnet designation was examined.

The investigation was an observational one-sample study design ($N = 142$). An electronic survey was used to assess perceived leadership style, empowerment, and safety culture. Data were collected on professional social media platforms, including LinkedIn. Additionally, Nurse

managers at the 2022 ANCC Magnet/Pathways Conference were approached to complete the online survey.

The investigation results suggest that education does not influence leadership style or empowerment; however, this study's findings suggest that nurse managers with an undergraduate degree are significantly more effective in their leadership abilities than nurse managers with graduate degrees (p =.036). In this investigation, Doctoral-prepared nurse managers were more likely to use a transactional form of leadership than Bachelor or Masters prepared nurse managers (p = .029). The participants' empowerment levels were lower than in similar nurse manager studies before 2020. This finding may be a post-pandemic symptom. Moreover, nurse managers who work in Magnet–designated facilities are more likely to perceive their work environment as safe (p = .006). Magnet status was additionally associated with nurse managers' ability to create success and influence their team (p = .037). The ANCC Magnet and Pathways Programs may blueprint an effective, safe nursing service.

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J.M.M

Chapter 1: The Problem

Historically, a head nurse would run a patient ward and be chosen based on bedside nursing skills; today the nurse manager role replaces the head nurse's role. Unfortunately, how nurse managers are chosen has not yet evolved in the same way as the role has developed. Nurse managers have traditionally been promoted due to their clinical bedside skills. The nurse who is revered as a good clinician, a leader of patient care with positive relations to physicians and other members of the multidisciplinary team, will often find themselves tapped on the shoulder to "step up" and take on the nurse manager role. This newly appointed nurse manager's excitement at the beginning of one's management tenure may quickly dissipate to despair when realizing the lack of preparation possessed to become the leader of people, processes, standards, budget, and in many situations, the multidisciplinary care team. The Peter Principle (Peter, 2009) surmised that when an employee is successful in a currently held position, the individual may eventually be promoted to a level of incompetence. Clinical excellence does not automatically translate to leadership excellence.

A nurse manager must understand and appreciate the clinical aspects of care and articulate patient and employee needs to organizational leaders. Their senior leaders need accurate knowledge to make informed decisions relating to budgeting, staffing, capital equipment, and new clinical programs. Nurse managers then translate organizational and quality goals to their staff, affecting the organization's outcomes. Therefore, effective leadership of nurse managers is necessary for the successful implementation of clinically and organizationally desired outcomes, planned for by their senior leaders (Khan et al., 2018; Weaver Moore et al., 2016).

Currently the education required to sit for the National Council Licensure Examination (NCLEX) Registered Nurse exam is decided by the individual state's Board of Nursing. The national educational preparation of registered nurse candidates varies from diploma-training school preparation to collegiate education at the associate, baccalaureate, and masters prepared degrees. The associate degree in nursing, first conceived by Mildred Montag during her doctoral preparation at Teachers College, Columbia University, consisted of a new model of workers in nursing. This model contained three levels of nurses with differentiating education requirements: the baccalaureate level is complex or professional, the associate level is intermediate or technical, and the non-collegiate or diploma is simple or assisting. Originally the intermediate level of nursing was conceived to be subordinate to the professional nurse, who would have obtained a higher level of education in nursing (McAllister, 2012). However, regardless of preparation, all nurse candidates will sit for the same direct entry into nursing examination.

At the moment, nurse managers are only required to possess the same requirements as entry-level nurses. Warshawsky and Cramer (2019) noted that, due to the vital impact nurse managers have in the organization; they must be competent. However, there is no minimum standard of academic education required for the advanced practice of nursing management. It cannot be expected that a nurse who has passed the NCLEX at the associate level, two years post-high school, is at the same level of preparedness for leadership roles as a nurse who possesses a graduate degree in nursing administration. Such was not the intent of the Associate in Nursing degree.

How can nurse managers lead teams of healthcare professionals with less academic preparation than the physician, advanced practice providers, physical therapists, and other nurses? Graduate education should no longer be an educational addition but an antecedent to

formal leadership roles in nursing. According to Rigolosi (2013), "nurses and health care managers will be leaders of themselves; of colleagues and peers in interdisciplinary clinical teams" (p. xiii). The time has never been more urgent for nurse managers to come to the table with higher academic knowledge if the nursing profession is to remain relevant in the realm of multidisciplinary leadership, where managers must stand equal to physicians and other healthcare staff with higher entry educational minimums. Moving forward, nurses need to have equal advocacy in the creation of health policies alongside their physician colleagues, not just on a local level but at a national level. The *Future of Nursing, Leading Change Advancing Health* (2010) report from the Institute of Medicine stressed nurses as leaders; but how can nurses lead and partner with teams of other healthcare professionals without achieving corresponding levels of education?

The American Association of Colleges of Nursing (AACN) has had a long-standing Position Statement on obtaining a baccalaureate degree for entry into practice. Staff nursing is entry level practice; management is not entry-level practice and requires varied levels of experience. Therefore, the nursing profession should have higher academic aspirations for nurses in formal leadership roles (AACN, 2000, 2019). The National Academy of Medicine's (NAM, 2020) *Report on the Future of Nursing* recommends in its course of action for the nursing profession 2020 to 2030: creating a culture of health, reducing health disparities, improving the U.S. population's health, and integrating the lessons learned from the COVID-19 pandemic. It is questionable if the nursing profession's unequal distribution of educational requirements for licensure will foster an equal distribution of collaborative decision making within a multidisciplinary healthcare team.

A necessary advantage gained through higher education is learning how to be a leader, specifically a transformational one. James Macgregor Burns (1978) described transformative leaders as seeking to fulfill their followers' higher needs and employing the whole person. Transformational leadership style has been widely studied in nursing (Cummings et al., 2008, 2010, 2018). Nurse managers who properly utilize this leadership style have demonstrated to be effective and are associated with positive outcomes for patients, productivity, and organizational effectiveness (Boamah et al., 2018; Cummings et al., 2008, 2010, 2018; Manning, 2016). Additionally, this leadership style has been reported to affect nurses' empowerment levels positively and lead to a culture of safety (Armstrong & Laschinger, 2006; Boamah et al., 2018; Fischer et al., 2018; McFadden et al., 2009; Murphy, 2005).

The nursing and healthcare community must not underestimate the nurse manager's impact on patient safety in complex healthcare environments. Nurse managers set the pace for the delivery of nursing care in their defined areas of practice within an organization. Patient safety and outcomes are of paramount importance in the care of patients. Patients entrust nurses with their lives and expect their nurses to be their healthcare advocates. The transformational leadership style empowers nurses to act as patient advocates. Nurses must be empowered to speak up when they see a situation that has the potential to be a safety concern. It is hard to believe that nurses who have gained a two-year, or for that matter a four-year, degree in basic nursing can be visionary and transformational in the current complex healthcare arena. Transformational leadership is not an innate talent but is instead obtained from higher education in leadership at the graduate level. Nurse managers who employ this style are able to empower their nursing staff, creating an environment of open communication that leads to a culture of safety for both patients and healthcare workers.

Problem Statement

The primary problem in this study is to investigate the relationships among nurse manager education levels and leadership styles, levels of empowerment, and perceived culture of safety.

Need for the Study

Management and leadership are distinct specializations within the discipline of nursing. Effective nurse managers are not born; they are educated, cultivated, mentored, and refined (Conley et al., 2007; Cummings et al., 2008, 2010, 2018). Nurse managers are directly accountable for: quality patient care, financial and operationally efficient care, regulatory compliance, human resource management, negotiation abilities, critical conversation skills, creating a culture of safety, and upholding a healthy work environment within their managerially defined area (American Organization of Nurse Leaders [AONL], 2015). Additionally, in complex healthcare organizations and systems, nurse managers cannot retain all essential information but must instead understand how and where to access information (Porter-O'Grady & Malloch, 2018). Clinical nurses are taught how and where to gain access to clinical nursing resources. A nurse leader needs to be educated in a different knowledge set to effectively lead and guide the clinical nurses as a unit, rather than the nurse leader working as an individual.

The 2010 Institute of Medicine (IOM) report, *The Future of Nursing Leading Change Advancing Health*, stated in Key Message Number 3, "Nurses should be full partners, with physicians and other health professionals, in redesigning health care in the United States" (p. 7). For the IOM's statement to be actualized, nurses must have similar educational preparation as physicians and other professional healthcare workers (IOM, 2010). Yoda-Wise et al. (2016) asserted that "without adequate educational achievement at the level of nurse administrators and

leaders; the discipline [of nursing] will have limited power in influencing future models of care" (p. 327).

In a 2017 study of 647 nurse managers conducted by Warshawsky and Cramer, 62% of the subjects obtained a baccalaureate degree in nursing, 39% of participants had achieved graduate level education, and only 15% had obtained certification in leadership (Warshawsky & Cramer, 2019). In the 2018 National Sample Survey of Registered Nurses (RN), less than half of the registered nurse workforce sampled had obtained a baccalaureate degree, and less than 20% of RNs sampled had a graduate degree (U.S. Department of Health and Human Services, 2019). In 2020, the National Council of State Boards of Nursing (NCSBN) administered a national survey of the nursing workforce in the United States, as it has every two years since 2013. The 2020 NCSBN report yielded 42,021 responses from Registered Nurses. It showed a trend toward an increasingly higher educated workforce than in previous surveys. According to the report, 65.2% of the RNs sampled have obtained a baccalaureate degree as their highest level of education. The report emphasized that younger RNs under the age of 34 were more likely to obtain their baccalaureate upon entry into nursing practice. At the current rate of educational achievement in nursing, it is unrealistic to expect that all Registered Professional Nurses can be full partners in leading transformation and progressing healthcare in the future. For nurses to influence innovative policy and healthcare, it is necessary to have a highly educated workforce at all levels, notably the formal leadership level.

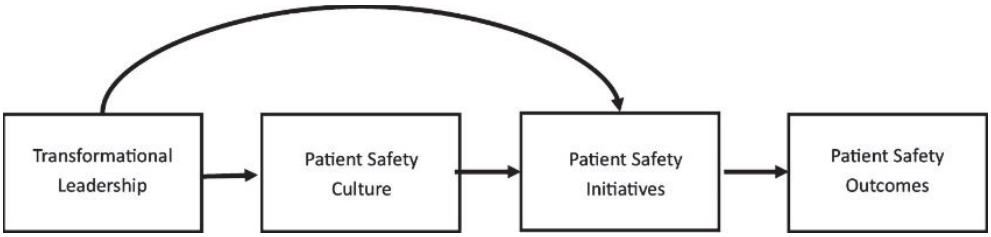
Nurse managers act as a liaison between patients, providers, nursing, and ancillary staff (Weaver Moore et al., 2016). A nurse's voice must be heard from the bedside to the board room in order to ensure that the patient's expectation of care is being shared with senior leadership,

including the C-suite. In order to break the glass ceiling of the board room, nurses must be equipped with knowledge gained at the graduate level.

Making a connection between transformational leadership style and subsequent patient safety initiatives that lead to enhanced patient safety outcomes has only recently been explored in healthcare and nursing literature (Boamah et al., 2018; McFadden et al., 2009; Murphy, 2005). McFadden et al., (2009) investigated a theoretical model for increasing patient safety among hospitalized patients. The model, *The Patient Safety Chain*, tested the variable of transformational leadership on the culture of safety, leading to increased awareness toward patient safety initiatives with the outcome of increased patient safety. The model (see Figure 1) showed a sequence of events that lead healthcare organizations to become highly reliable (McFadden et al., 2009).

Figure 1

The Patient Safety Chain



Note: This figure demonstrates the relationships among transformational leadership, patient safety culture, patient safety initiatives, and subsequent patient safety outcomes. McFadden, K.L., Henagan, S.C., & Growen, C.R., III. (2009). The patient safety chain: Transformational leadership's effect on patient safety culture, initiatives, and outcomes. *Journal of Operations Management, 27*, 390-404. https://www.doi.org/10.1016/j.jom.2009.01.001

Fischer et al. (2018) set out to validate the patient safety chain model in nursing management utilizing a Delphi survey methodology; consensus on the variables that lead to patient safety chain outcomes was achieved. The investigation concluded that nursing leadership

style has a powerful effect on influencing the culture of safety at the unit level. The study further stated that more research on the particular processes of the patient safety chain warrant further investigation (Fischer et al., 2018).

Nurse managers are perfectly situated at the local level to leverage structural empowerment for their staff nurses. According to Kanter (1977), power makes a difference in leadership. Kanter, stated:

> What does make a difference is power—power outward and upward in the system: the ability to get for the group, for subordinates or followers, a favorable share of resources, opportunities, and rewards possible through the organization. (p.168)

Developing nurse manager skills to empower their nursing staff is an essential competency for the contemporary nurse leader.

Nurse managers significantly influence patient outcomes directly and indirectly (Cummings et al., 2008, 2010, 2018). They are directly involved in patient activities, including multidisciplinary rounds, patient advocacy, and direct patient care. Indirectly nurse managers significantly influence the culture of safety and outcomes, both positively and negatively (Fischer et al., 2018; McFadden et al., 2009). Nurse managers empower or disempower clinical nurses through the constructs built within managerially defined areas. It is imperative to investigate the interrelationships among levels of nurse manager education and the patient safety chain. Should nurse managers who influence patient safety and organizational outcomes be among the most prepared in the interdisciplinary team, or is being minimally prepared sufficient? To what extent does a nurse manager's academic graduate education influence the patient safety chain of transformational leadership, empowerment, and culture of safety? This investigation set out to examine these questions.

Purposes

The following purposes have been investigated in this dissertation.

1. *The perceived leadership styles of nurse managers in an acute care hospital, clinic and home health care using the Multifactor Leadership Questionnaire 5X (MLQ-5X)* (Avolio & Bass, 2004). The leader styles identified in the MLQ-5X are transformational, transactional, passive-avoidant behavior, and outcomes of leadership. For this investigation, the nurse manager subjects completed the leader form self-assessment MLQ-5X questionnaire.
2. *The levels of structural empowerment of nurse managers using the Conditions for Work Effectiveness Questionnaire II (CWEQ-II)* (Laschinger et al., 2001). The six-subscale version of the instrument was used in the study; the subscales are designed to assess perceptions—namely, access to opportunity, access to information, access to support, and access to resources. The Job Activities and Organizational Relationships scales measure perceptions of formal power and informal power. In sum, the six subscales measure Total Structural Empowerment. Additionally, the Global Empowerment subscale was investigated. The nurse manager participants completed the CWEQ-II instrument.
3. *The perceived culture of safety of the nurse manager subjects using the Hospital Survey on Patient Safety Culture 2.0 (HSOPS)* (Agency for Healthcare Research and Quality, 2019). The HSOPS 2.0 measures ten subscales—namely, Communication About Error, Communication Openness, Handoffs and Information Exchange, Hospital Management Support for Patient Safety, Organizational Learning-Continuous Improvement, Reporting Patient Safety Events, Response to Error, Staffing and Work Pace, Supervisor, Manager, or Clinical Leader Support for Patient Safety, and Teamwork. For the purposes of this investigation the nurse manager

participants completed the questions for the subscales Communication About Error, Communication Openness, Hospital Management Support for Patient Safety, and Teamwork.

4. *The demographic variables of nurse manager subjects*—namely, age, gender, race, highest academic level, certification, years as a nurse manager, type of unit/area managed, number full-time equivalents managed, urban or suburban setting, and Magnet or non-Magnet hospital designation—using a nurse manager demographic questionnaire.

The Three main variables of the study—namely, leadership styles, empowerment, and culture of safety—were correlated with each other. The relationships among the demographic variables with the three main variables were additionally investigated.

Definition of Terms

The operational terms that will be used in this study are presented here. The terms are introduced independently.

Nurse Manager

A nurse manager subject is a licensed Professional Registered Nurse who manages professional registered nurses and others, namely, unlicensed nursing assistive personnel and all team members within a distinct clinical and managerial responsibility area. The nurse managers will receive all instruments used in this investigation.

Leadership

Leadership has many faces called styles. This study will examine the perceived nurse manager subject's leadership styles utilizing Avolio and Bass's (2004) Multifactor Leadership Questionnaire (MLQ-5X). The variables measured in the MLQ-5X are transformational,

transactional, passive-avoidant behavior, and outcomes leadership (Avolio & Bass, 2004). Each style of leadership is defined separately.

Transformational Leadership

Transformational leadership aims to inspire followers in an illustrative charismatic manner to create a motivated workforce. Followers change their perspectives of what is important and what is possible as transformational leaders proactively seek to enhance the individual performance of the follower (Avolio & Bass, 2004). According to Avolio and Bass, transformational leaders transform their followers to perform past the leader's expectations through idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration.

Idealized Influence. Through attributes and behaviors, transformational leaders instill a perception of confidence and reverence in their followers. The transformational leader cascades their vision to the followers, creating a sense of purpose in the followers. Leaders who instill idealized influence are consistent in their application of ethics, principles, and values. Transformational leaders convey confidence and strength to their followers (Avolio & Bass, 2004).

Inspirational Motivation. When a leader conveys their vision and tactics to achieve their vision in an optimistic style, meaning and purpose are instilled in the followers. Speaking enthusiastically about the future builds confidence in the followers and provides them with a vision of the future and their place in that future (Avolio & Bass, 2004).

Intellectual Stimulation. Intellectual stimulation refers to the leader encouraging the followers' efforts by approaching work challenges in new ways with questioning, re-examination

of old assumptions, seeking divergent views, and suggesting different ways to accomplish work tasks (Avolio & Bass, 2004).

Individual Consideration. The individual development of followers is of paramount importance to the transformational leader. The potential of the follower is supported by the leader through coaching, mentoring, and creating opportunities. The follower is treated as an individual and with individual developmental requirements, aptitudes, and goals (Avolio & Bass, 2004).

Transactional Leadership

Expectations and rewards for performance are clear from a transactional leader. Behaviors that are associated with transactional leadership fall under two domains: constructive or contingent reward, and corrective leader style or management by exception (Avolio & Bass, 2004).

Contingent Reward. The contingent reward style of leadership provides rewards and recognition when goals are achieved. The hallmark is the assistance of the leader for the followers' efforts in clarity of task and completion of responsibilities. The leader has established clear reward recognition if the task is achieved, and satisfaction expressions when expectations are met. When a contingent reward leader's goals are actualized, it results in the individual follower achieving expected execution levels (Avolio & Bass, 2004).

Management-by-Exception: Active. The leader identifies compliance for the followers' performance as well as followers' ineffectiveness. The leader may punish the followers for being out of compliance with the leaders' requirements. This leadership style focuses on deviating from the standards, putting full effort into correcting errors, grievances, and failure. Leaders using this style keep track of the failures of their followers and direct their attention toward

errors. The leader takes swift action when a follower is out of compliance (Avolio & Bass, 2004).

Passive-Avoidant Behavior

Passive-Avoidant behavior in a leader is categorized as a management-by-exception style, but more reactive in nature. The passive leader avoids setting clear expectations, agreements, goals, and tactics with their followers. This style has a negative impact on followers' performance and satisfaction (Avolio & Bass, 2004). Passive-Avoidant Behavior contains two sub-categories: management-by-exception and laissez-faire.

Management-by-Exception: Passive. The leader who employs a management-by-exception passive behavior style will not intervene in a problem until it is severe. This leader will wait for issues to arise or become chronic problems before acting. If a process is not broken, this leader will not seek to improve it (Avolio & Bass, 2004).

Laissez-Faire. The laissez-faire leader does not lead the followers or intervene, even when problems occur. The laissez-faire leader is absent when needed, avoids making decisions, and delays responding to the followers' urgent needs (Avolio & Bass, 2004).

Outcomes of Leadership

The success of the followers can be achieved by both transformational and transactional methods of leadership styles. According to Avolio and Bass (2004), success is quantified in three ways: (1) how often the followers perceive their leader as motivating, (2) how often the leaders are successful in interacting at different levels in the organization, and (3) how satisfied the follower is with their leader's chosen leadership approach (Avolio & Bass, 2004). Outcomes of leadership are further broken down into the sub-categories of extra effort, effectiveness, and satisfaction with leadership.

Extra Effort. Extra effort refers to the leader's ability to create success within the individual and the team. The leader influences the followers to exceed expectations, enhances the follower's desire to succeed, and enriches the followers' enthusiasm for challenging work (Avolio & Bass, 2004).

Effectiveness. Effectiveness refers to the leader's ability to meet the followers' work-related needs, represent their work group well to the leader's superiors, meet organizational requirements, and lead an effective team (Avolio & Bass, 2004).

Satisfaction with Leadership. Satisfaction with Leadership encompasses the followers' satisfaction with the leader's chosen leadership method. Additionally, satisfaction of the followers includes how well the leader works with others in the organization (Avolio & Bass, 2004).

Structural Empowerment

Laschinger et al.'s (2001) Conditions of Work Effectiveness Questionnaire II (CWEQ II) was utilized in the current study to assess clinical nurses' perceptions of structural empowerment. The six-subscales of the CWEQ II measure access to opportunity, access to information, access to support, and access to resources. Additionally, the CWEQ II instrument measures formal and informal power (Laschinger et al., 2012). Laschinger et al. (2001) built the CWEQ II instrument applying Kanter's definition of structural empowerment. Kanter (1977) defined power as the capacity to harness organizational information, resources, and support to accomplish organizational goals. Structural empowerment, according to Kanter, is the degree to which organizational constructs allow access to information, resources, and support to accomplish organizational goals.

Access to Opportunity

Perceived access to work empowerment through opportunity assesses the individuals' perception of the likelihood of development and progress within the constructs of the employees' institution and the perceived opportunity to enhance individual knowledge and skills (Laschinger, 2012; Laschinger et al., 2001).

Access to Information

The perception of an employee's access to information encompasses the employee's access to acquiring knowledge in formal and informal methods through work structures to aid the employee to be successful in the workplace (Laschinger, 2012; Laschinger et al., 2001).

Access to Support

Access to Support refers to the employees' perception of feedback and guidance provided to individuals. The feedback and guidance can be perceived from superiors, peers, and subordinates (Laschinger, 2012; Laschinger et al., 2001).

Access to Resources

Access to Resources relates to an individual's capability to obtain the finances, materials, time, and supplies to accomplish their essential work tasks (Laschinger, 2012; Laschinger et al., 2001).

Formal Power

Formal Power is defined as specific work attributes, including flexibility, adaptability, creativity associated with discretionary decision-making, visibility, and centrality to organizational purposes and goals within the organizational structure (Laschinger, 2012).

Informal Power

Within the organizational structure, informal power is drawn from social connections, communication development, and information networks with sponsors, colleagues, subordinates, and multidisciplinary teams (Laschinger, 2012; Laschinger et al., 2001).

Culture of Safety

For this study's purpose, the term *culture of safety* is adopted from the Agency for Healthcare Research and Quality (AHRQ) and consists of an organization's relentless attention to minimize harmful events. AHRQ (n.d.-a) emphasized, "Such organizations establish a culture of safety by maintaining a commitment to safety at all levels, from front line providers to managers and executives." The instrument contains ten subscales for Health Care Research and Quality's Hospital Survey on Patient Safety Culture 2.0. For this investigation, four subscales were used: communication about error, communication openness, hospital management support for patient safety, and teamwork (AHRQ, 2019).

Communication About Error

Communication about error refers to staffs' perception of receiving information about errors that have occurred and discussions about procedures for preventing further errors. Additionally, staff members perceive that leaders will inform the team when a change in procedure has transpired based on reports of a safety event (AHRQ, 2019).

Communication Openness

Communication openness relates to a staff member's ability to feel comfortable asking questions and speaking up if they see something they perceive as unsafe in the clinical setting (AHRQ, 2019).

Hospital Management Support for Patient Safety

Hospital management support for patient safety involves the employees' perception of the importance that the management team places on patient safety. The employees perceive that safety is a top priority to the management team (AHRQ, 2019).

Teamwork

Teamwork measures perceptions of staff working together as an effective team inclusive of helping one another during busy hours in a respectful manner (AHRQ, 2019).

Assumptions

The study assumptions are as follows. All subjects in the study were able to speak, read, and write in the English language. The study assumed that all the participants were honest and forthright in answering the questionnaires. The investigator further assumed that the instruments used in this study are suitably reliable and valid for measuring nurse managers' leadership style, empowerment, and culture of safety.

Limitations

Due to the sample in this investigation, the findings of this study were generalizable to the acute, clinic, and home health nurses from urban and suburban setting in the United States and abroad who attended the American Nurses Credentialing Center's 2022 Magnet and Pathways to Excellence Conference, and/or had access to the professional social media platforms LinkedIn and/or Magnet Learning Communities. Nevertheless, it is important to note that the subjects were intended to be from urban and suburban acute care hospitals, clinics, and homecare agencies, and it is probable that these subjects are similar to other subjects in other urban and suburban acute care hospitals, clinics, and homecare agencies. Therefore, it is reasonable to

assume that the nurses in this investigation are similar to other nurses in acute urban and suburban hospitals, clinics, and homecare agencies.

Significance

The role of the nurse manager is in a state of rapid metamorphosis. Nursing has changed significantly since the associate technical nurse position was introduced and implemented by Montag and her dissertation advisor, Professor Louise McManus, in the 1950s (McAllister, 2012). The knowledge needed to lead through this change may not happen at the diploma, associate, or baccalaureate level. Graduate academic achievement may hold the key to command the vast information needed to lead multidisciplinary teams of healthcare clinical staff. To this author's knowledge, a study linking nurse manager education levels, the patient safety chain, empowerment, and culture of safety has not been performed.

Summary

Chapter 1 introduced the problem and presented the problem statement. Discussed in this chapter was the need for the study, purposes, and the definition of terms. The chapter incorporated the assumptions, limitations, and significance of the research. Chapter 2 will present a detailed review of the literature and the theoretical framework that was used in this investigation.

Chapter 2: Review of the Literature

Chapter 2 begins with the conceptual framework applied to this investigation. A review of foundational and relevant literature will follow the conceptual framework. The literature review focuses on the following areas: the history of formal nursing education in the United States; leadership, namely, trait theory, behavioral, situational, contingency, transformational, transactional leadership, and Full–Range leadership; empowerment in nursing; and the culture of safety in acute care hospitals. Additionally, the history and elements of the American Nurses Credentialing Centers Magnet Recognition Program® is reported.

Kanter's Theory of Empowerment

"The true sign of power is accomplishment–not fear, terror, or tyranny"
-- Rosabeth M. Kanter

Kanter (1977) authored the book *Men and Women of the Corporation* and theorized that organizational behavior and an organization's structural determinants could promote or curtail employee motivation, thereby increasing or decreasing the organization's efficiency and achievements. Kanter hypothesized that access to information, resources, support, and structural opportunity create empowerment conditions within an organization.

Kanter's (1977) theory of empowerment has been widely tested in nursing and is associated with nursing satisfaction, perceptions of autonomy, trust in management, accountability for practice, and decreased stress at work (Laschinger et al., 2003). Kanter's theory asserts that social structures within the work environment influence the behavior of the

employee regardless of the favorable attributes of the individual employee (Laschinger et al., 2003).

Armstrong and Laschinger (2006) emphasized, "Nurses who feel that their work environments are empowering are more satisfied, are more committed to the organization, and report high quality of nursing care in their units" (p. 124). Upward opportunity plays a significant role in an employee's decision to stay engaged in a particular organization. Kanter (1977) differentiated employee job satisfaction from commitment to a staff member's work, stating:

> Thus, studies of "job satisfaction" based on just the job and its immediate setting are too narrow; they would not pick up, nor be able to explain, the variety of effects that are associated with degrees of opportunity. (p.162)

Kanter (1977) described two kinds of power in a corporation—formal and informal. Directors, managers, and supervisors in a corporation who influence subordinates to accomplish work and are accountable for organizational results may believe before stepping into a position that power is automatically attributed to their title. However, according to Kanter, power is more likely gained through covert political channels. Power is how a manager obtains resources and opportunities for their subordinates. Followers may relate well to the leader, even if the subordinates have low job satisfaction and morale. Employee satisfaction and morale have more to do with the leader's power within, and around the organization than the relationships the leader fostered with their subordinates (Kanter, 1977). Kanter claimed that increased numbers of employees empowered within the organization can be more effective and productive.

Formal Nursing Education in the United States

"Let us never consider ourselves finished nurses…We must be learning all of our lives"
-- Florence Nightingale

The National League for Nursing and the Evolution of the Profession

The National League for Nursing (NLN) has a rich history of promoting excellence in nursing education, advocating for diversity, and improving the nation's health (www.nln.org). At the 1893 Chicago World's Fair, the antecedent to the NLN was formed and named the American Society of Superintendents of Training Schools for Nurses (NLN, 2018). Behind the formation of the nation's first professional nursing society were the pressing issues of establishing higher educational minimum requirements for entry into the nursing profession, working and living condition improvements for student nurses, and expanding opportunities for specialized training after graduation. Isabel Hampton, the Superintendent of the Johns Hopkins training school, was passionate about the standardization of nurse training and chaired the first organizing group of superintendents (NLN, 2018).

Linda Richards was born on July 27, 1841, in Potsdam, New York to missionary parents. Young Linda moved many times in her life and nursed ailing family relatives along the way (AAHN, 2018). Richards was in the first training program at the New England Hospital for Woman and Children in Boston, Massachusetts, graduating in 1872. She then went on to a successful career as a superintendent at several hospitals, including Bellevue, the first Nightingale training school in the United States. Richards faced physician opposition for her didactic lectures as opposed to intermittent physician lectures (AAHN, 2018). In a speech by Linda Richards in Boston, Massachusetts at the Second Convention of the Superintendents in 1895, She stated, "Instructions in schools must be made more uniform, the standard must be raised" (NLN, 2018). In 1897, the society formed the Associated Alumnae of the United States

with the intent that these nurses would improve nursing practice through an organization that would later be known as the American Nurses Association. In 1900, *The American Journal of Nursing* was founded, further establishing nursing as an academic pursuit.

In 1903, M. Adelaide Nutting became the chair of the Education Committee to create a program in which nurses are educated to become teachers (NLN, 2018). Nutting began her nursing teacher preparation program at Teachers College, Columbia University, in 1898, where she launched the first university classes for prospective educators and administrators of nursing (Teachers College, Columbia University, n.d.). In 1912, Lilian Wald, influenced by her public health instruction at Teachers College, chaired a committee to create standards for visiting nurses in the United States (Jewish Women's Archive, n.d.; NLN, 2018). That same year, the National League for Nursing Education (NLNE) was formed to expand beyond superintendents of nurse training schools and include those who teach and practice nursing.

The Committee on Education, chaired by Nutting, published the Standard Curriculum for Schools of Nursing in 1917. Later in 1923, Nutting stated at the annual association meeting in New York that nurses had supported the explosive growth of hospitals in the United States since the formation of the society. The hospitals provided nurses with training; Nutting stated, "The nurse [was] becoming thereby and inevitably a by-product of her service to the hospital" (NLN, 2018). Nutting supported nursing education outside of the hospital institution.

The Associate Degree in Nursing

The Carnegie Corporation commissioned sociologist Ester Lucile Brown to report on and make recommendations for the nursing profession in response to the nursing shortage that followed World War II (Blee, 1949; Orsolini-Hain & Waters, 2009). The 1948 report made 24 recommendations for the profession of nursing that included who should manage, govern, and

fund nursing programs (Blee, 1949; Orsolini-Hain & Waters, 2009). The report looked unfavorably at hospital-based training and diploma programs and recommended that nurses be trained at the collegiate level (Orsolini-Hain & Waters, 2009).

R. Louise McManus of Teachers College, Columbia University earned a Ph.D. in Educational Research from Columbia University in 1946. McManus has the distinction of being the first nurse to earn a Ph.D. degree (Center for Nursing, 2017). In the late 1940s, McManus was investigating new nursing education models (Harker, 2017; McAllister, 2012; Orsolini-Hain & Waters, 2009). Mildred Montag, a doctoral student at Teachers College, was encouraged by McManus to pursue her dissertation and ultimately proposed the associate in nursing degree in 1948 (Harker, 2017; McAllister, 2012; Orsolini-Hain & Waters, 2009). The political and nursing landscape was ripe to pilot the two-year nursing program at community colleges, introducing a bi-level nursing model of technical nurses that were associate prepared to assist the professional nurse that was baccalaureate prepared (Harker, 2017; McAllister, 2012; Orsolini-Hain & Waters, 2009). However, the role of the associate-prepared nurse, as envisioned by Montag, has yet to come to fruition, and associate and baccalaureate-prepared nurses function at the same level of autonomy regardless of nursing preparations.

American Association of Colleges of Nursing

The American Association of Colleges of Nursing (AACN) was formed in 1969 with the mission to be the prominent facilitator for "excellence and innovation in nursing education, research, and practice" (AACN, 2019). Today the AACN fulfills that mission by establishing academic standards and accreditation for more than 850 nursing programs throughout the United States. Position statements and white papers emanating from AACN aim to drive the profession's trajectory toward a highly educated workforce (AACN, n.d. - a).

There are nine programs offered through AACN affiliation that include curriculum standards, health policy advocacy, leadership development, and diversity and inclusion, among others. The Commission on Collegiate Nursing Education is the accrediting body of the AACN. The AACN disseminates information for Deans of Schools of Nursing, faculty, and students that includes educational resources, initiatives in nursing educational processes, and professional development opportunities (AACN, n.d. - b). Most notably, the AACN establishes the core competencies for Professional Nursing Education, known as *The Essentials*.

Educational Preparation upon Nursing Practice Entry and Beyond

The level of academic nurse education for entry into the profession debate began at the American Society of Superintendents of Training Schools for Nurses meeting at the Chicago World's Fair in 1893 (NLN, 2018). The current nursing era has not decided on the academic criteria for entry-level nursing practice. A simple Google search revealed that Registered Professional Nurses can be educated at the diploma, associate, or baccalaureate academic levels in the United States. Additional pathways for direct entry practice are the Masters and Doctor of Nursing Practice degrees that were originally established for college graduates with non-nursing degrees.

Professional Registered Nurses may stay at the bedside for their entire career, directly caring for and educating the population. Nurses may choose to advance into specialty areas within nursing that may or may not require additional educational degrees or certifications. Masters degrees in nursing run the gamut from clinical-based advanced practice nursing, such as a Nurse Practitioner, Nurse Midwife, or Nurse Anesthetist, to Nursing Administration, Informatics, Population Health and Education. The Nurse Practitioner (NP) role, established out of the necessity for access to pediatric care, was created in Colorado by Dr. Loretta Ford and

Dr. Henry Silver in the 1960s (Berg, 2020). Nurse Practitioners are educated at the Masters or Doctor of Nursing Practice (DNP) academic level (McCauley et al., 2020). According to the American Association of Nurse Practitioners (AANP, 2019), there are over 270,000 NPs in the United States. Other clinical nurse roles that require a graduate degree as the minimal preparation are the Certified Nurse Midwife and Nurse Anesthetist.

There are several recognized doctoral degrees in nursing, most notably the Doctor of Philosophy (Ph.D.), Doctor of Nursing Science (D.N.Sc.), and the Doctor of Education (Ed.D.). The Doctor of Nursing Practice degree was established in response to the Institutes of Medicine's (IOM) 1999 landmark report on medical errors and the 2001 report on quality and safety. These two reports were the catalyst for creating more highly educated nursing leadership (McCauley et al., 2020). According to McCauley et al., nursing, pharmacy, and physical therapy began to move their disciplines to a terminal practice doctorate. While the professions of Physical Therapy and Pharmacy quickly adopted the recommendations, Nursing did not. According to the American Physical Therapy Association (APTA, 2022) and the Accreditation Council for Pharmacy Education (ACPE, n.d.), the minimum level of education for a Physical Therapist in the United States is the Doctor of Physical Therapy degree and the Doctor of Pharmacy degree for pharmacists. However, nursing pathways to an NP degree that assess and prescribe medication remain in a state of educational pathway perplexity (McCauley et al., 2020).

Nurse Leader Competency

The American Organization for Nursing Leadership (AONL), a subsidiary of the American Hospital Association, provides the nursing profession guidance on leadership at all nurse levels in the United States (AONL, 2023). The organization provides direction for the

education and development of nurse leaders through competencies. Additionally, AONL has an advocacy arm that addresses critical issues faced by nurses. AONL offers certification for nurses in administration, Nurse Manager and Leader, and Nursing Executive practice, founded on the Core Competencies Model (AONL, 2023; Hughes et al., 2022). The core competencies are intended to be used throughout the leader's career and consist of six domains: Communication and Relationship Building, Leadership, Knowledge of the Health Care Environment and Clinical Principles, Professionalism, Business Skills and Principles, and the Leader Within (Hughes et al., 2022). Nevertheless, the specialization of Nursing Administration does not require a Masters degree to practice.

Chen et al. (2022) conducted a systematic literature review of interventions to improve the competence of nurse managers. Many organizations have developed nursing leadership programs outside of formal leadership education to close the gap in the breadth of leadership competencies a nurse leader should possess to lead an effective team. The investigation included 69 studies inclusive of quantitative, qualitative, and mixed method research utilizing the Joanna Briggs Institute (JBI) method for critical appraisal (Chen et al., 2022). The results showed that while nursing leadership programs were valuable in increasing leadership competencies, barriers existed that prevented the learners from applying the newly gained leadership knowledge and skills (Chen et al., 2022). Among the barriers the nurse leaders expressed were inadequate staffing, a lack of time, and unsatisfactory support from superiors and staff (Chen et al., 2022).

Leadership

"We are what we repeatedly do. Excellence, then, is not an act, but a habit."
-- Aristotle

Florence Nightingale's leadership legacy lives on in modern nursing and has remained relevant since the 1800s. Nightingale was a trailblazer in many aspects of nursing, most notably

in her ability to lead and shape the profession. Nightingale's *Notes on Nursing: What it is and What it is Not* (1865), is a pivotal book for the foundation of contemporary professional nursing practice, education, and leadership. Nurse leaders are still studying and referencing her body of work in the present day.

The early concept of leadership revolved around the individual leaders' inherent personality traits. According to Arenas et al. (2017), Great Man Theory research in the 1900s investigated the differences in personality attributes between perceived average and exceptional leadership. The leadership mantra, *leaders are born, not made*, originates in Great Man Theory (Arenas et al., 2017; Rigolosi, 2013; Rundio et al., 2016). In the latter half of the 1900s, new leadership theories emerged. John W. Gardner described the traits of a successful leader, which included physical fitness, decision-making ability, adaptability, awareness of employee needs, and motivation, among others (Deshwal & Ashraf Ali, 2020). This time in history was ripe for new leadership theories, including behavioral, situational, transactional, and transformational theories of leadership (Deshwal & Ashraf Ali, 2020).

Behavioral Leadership

Behavioral leadership styles were derived from organizational theorists as an alternative to trait theories of the early 1900s. Some of the most notable behavioral theory academics—Maslow, Hertzberg, and Hersey—examined and hypothesized leaders' behaviors in the 1940s and '50s (Arenas et al., 2017; Rigolosi, 2013; Rundio et al., 2016). These theorists rejected the Great Man proposition. The prevailing behavior types derived from behavioral theory are autocratic, democratic, and laissez-faire leadership styles. The autocratic style is authoritative, imposing, and in many instances oppressive (Rigolosi, 2013; Rundio et al., 2016). The democratic leader governs by consensus and does not make unilateral decisions but rather seeks

followers' approval. The laissez-faire leader style is passive, keeping their followers at bay. Behavioral theories of leadership operated on the premise of behaviors of the leader and essentially disregarded the context of the situation (Benmira & Agboola, 2021).

Situational and Contingency Theories of Leadership

The leadership theories that emerged in the 1960s began conceptualizing the environment as a significant element in the relationships between leaders and followers (Agboola & Benmira, 2020; Rigolosi, 2013). The theorists of this era surmised that leadership can be a learned practice and rejected the trait theory of leadership (Deshwal & Ashraf Ali, 2020). A hallmark of contingency theory is the ability of the leader to assess the self (leader), the employees (staff), and others (stakeholders) as it applies to the task at hand (Rigolosi, 2013). Situations instead of the leaders' innate qualities are the hallmark of this leadership style. According to Rigolosi (2013), the leadership theories that came out of this school of thought were similar in composition and included archetypes such as the Ohio State Model of Leadership, and Hersey and Blanchard's (2008) Situational Leadership Theory (Rigolosi, 2015).

Fred Fielder developed the first contingency theories in leadership and postulated that no one leadership style will be effective in every situation. Fielder hypothesized three elements of effective leadership: (1) well-defined objective, (2) the follower's admiration for the leader, and (3) the position power the leader has over the follower (Asrar-ul Haq & Anwar, 2018; Rundio, 2016). Fielder claimed that the leader's style was not easily changed, and in order for the leader to be effective, he would need to have his style match the situation (Agboola & Benmira, 2020; Rundio, 2016).

Transactional, Transformational, and Full–Range Leadership

James Macgregor Burns's (1978) groundbreaking book, *Leadership*, introduced the concept of transactional and transformative leadership that has inspired leadership research over the past four decades (Siangchikyoo et al., 2020). Burns (1978) defines *leadership* as: "leaders inducing followers to act for certain goals that represent the values and the motivations—the wants and the needs, the aspirations and the expectations—of both the leaders and followers" (p. 19). Burns describes transactional leadership as an exchange where the leader rewards followers for their services. The reward could be monetary, political, or another self-serving exchange. The leader and the follower are aware of the transactional affiliation; however, there is no bond other than the immediate leader-employee contract (Burns, 1978).

Conversely, the transformative leader builds a bond with the employee, and together they work toward a mutual goal, lifting each other to achieve a shared objective. In a transformative relationship, the leader and the follower inspire each other to work together to achieve common goals (Burns, 1978). Burns describes a snowball effect on the followers, who are inspired to become leaders, propelling the flywheel of transformative leadership.

Full–Range Leadership, first asserted by Avolio and Bass in 1991, expands transformational and transactional leadership theories to include nine leadership elements (Antonakis et al., 2003). The Full–Range leadership theory does not claim to encompass all possible leadership styles. However, it focuses on a specific range of motivating and inspiring forms of leadership to avoidant leadership styles (Antonakis et al., 2003). The Multifactor Leadership Questionnaire 5X (MLQ–5X, Avolio & Bass, 2004), used in this investigation, measures Full–Range leadership. Full–Range leadership includes transformational, transactional,

and passive-avoidant leadership styles (Avolio & Bass, 2004). Additionally, the MLQ–5X includes the measurement of outcomes of leadership effectiveness.

Transformational Leadership in Nursing

Transformational Leadership has been extensively studied in nursing leadership, practice, and academia (Cummings et al., 2008, 2010, 2018). Cummings et al. conducted a systematic review of leadership styles in nursing and compared the style to the effectiveness of leadership in nursing. The analysis included 129 quantitative research investigations, mainly conducted in North America. The study divided leadership practices into two main categories: (1) relation-focused and (2) task-focused. Relation-focused leadership includes leadership styles that motivate the nursing workforce through relationships and include Transformational and Authentic leadership styles. Task leadership styles, mainly transactional leadership styles and dissonant leadership styles, including management-by-exception and laissez-faire, were included in the review. The review revealed that relationship leadership styles yielded higher nurse empowerment, increased nurses' intent to stay at their jobs, and produced significantly higher nurse retention rates.

Avolio et al. (2004) studied transformational leadership's effect on psychological empowerment and organizational commitment using the MLQ–5X questionnaire with 520 staff-level nurses working in a public hospital in Singapore. This investigation examined the senior leader and the immediate leader's relationship with the staff nurse. The findings of this study showed a positive correlation between transformational leadership and organizational commitment. Higher levels of empowerment are additionally associated with positive organizational commitment, and the transformational leadership of the direct supervisor had less

of an impact on the direct care nurses than the senior leader's transformational leadership (Avolio et al., 2004).

Empowerment in Nursing

Leaders become great, not because of their power, but because of their ability to empower others
– John Maxwell

Rosabeth Kanter's (1977) empowerment theory has permeated nursing literature and research related to structural empowerment of nurses in practice, leadership, and academia. Kanter charged organizational leaders to cultivate work environments that gave employees access to information, support, resources, and opportunity (Kanter, 1977; Laschinger et al., 2001, 2009). Structural empowerment in nursing is influenced by the organization's political and social norms and has been linked to improved job satisfaction, decreased burnout, and increased organizational commitment (Friend & Sieloff, 2018; Khan et al., 2018; Laschinger et al., 2009).

Laschinger et al. (2009) studied how structural empowerment leads to psychological empowerment at the individual employee level. The investigation utilized a predictive, non-experimental design using validated survey questionnaires, including the Conditions of Work Effectiveness Questionnaire (Laschinger et al., 2009). The sample consisted of 404 nurses from Ontario, Canada. Structural equation modeling predicted that staff nurses who perceived structural empowerment in their work environment had higher levels of psychological empowerment (Laschinger et al., 2009).

In a 2018 study conducted with nurses working in the Intensive Care environment, clinical and supervisory level nurses were randomized into an intervention group and a non-intervention group (Amiri et al., 2018). The intervention group attended a two-day workshop on educational empowerment. The investigation used the Hospital Survey on Patient Safety Culture from the Agency for Healthcare Research and Quality. The pre–test responses did

not differ by group. The results were significantly different in the experimental group as compared to the control group post–test, $p < 0.001$, suggesting that an empowered nursing staff may improve the global culture of safety in the intensive care unit (Amiri et al., 2018). A study conducted by Khan et al. (2018) comparing the perceived empowerment of staff nurses based on their manager's transformational leadership behaviors suggested that staff nurses' empowerment is moderately correlated with the transformational leadership behaviors of their management. Interestingly, transactional behaviors were additionally related to staff nurses' empowerment, however to a lesser extent (Khan et al., 2018).

Trus et al. (2018) studied empowerment in the context of functional organizational culture and workplace climate in 193 Lithuanian nurse managers. Organizational culture and climate were described in the investigation as "networks that constrain and promote certain behaviors and interactions in the organization where individuals work" (Trus et al., 2018). The results of this investigation suggest that when organizations have an appropriate culture and climate, nurse managers are more likely to be empowered and have a positive effect for the individuals under the nurse managers and the overall organization. Sheila Boamah examined transformational leadership behaviors, structural empowerment, and staff nurses' clinical leadership and adverse patient events in a cross-sectional survey design in an acute care hospital in Canada. Structural equation modeling results were significantly correlated with a decrease in adverse patient events.

Patient Safety

"The single greatest impediment to error prevention in the medical industry is that we punish people for making mistakes."

-- Lucian Leape

The Institute of Medicine (IOM)'s Committee on Quality of Health Care in America produced two landmark reports in the early 2000s that have led to extensive research, attention, and value–based purchasing payment models to incentivize healthcare organizations to produce quality outcomes (AHRQ, 2020). *To Err is Human: Building a Safer Health System* (IOM, 2000) and *Crossing the Quality Chasm: A New Health System for the 21st Century* (IOM, 2001) painted a grave portrait of patient safety in the United States. The committee's first report, *To Err is Human* (IOM, 2000), stated that medical errors in the U. S. were the eighth leading cause of death in the U.S. and that more people died due to health care errors than in motor vehicle accidents. The subsequent and final report from the committee, *Crossing the Quality Chasm* (IOM, 2001), calls for transforming the health care system in the 21st century to narrow the gap between research and practice in the United States. The committee identified six aims for health care: health care should be safe, effective, patient centered, timely, efficient, and equitable (IOM, 2001).

Despite 23 years of research and attention to quality concerns in health care, patients are still harmed due to adverse drug events, healthcare-associated infections, falls, and obstetrical errors, contributing to thousands of mortalities and morbidities yearly (AHRQ, 2020). According to the Agency for Health Care Research (AHRQ), hospital-acquired conditions have declined since the early 2000s; however, the most recent report, *Making Healthcare Safer III*, estimates that there are 86 hospital-acquired conditions per 1000 hospital discharges (Hall et al., 2020).

Patient Safety in Nursing

Patient safety outcomes have as much to do with nursing practice as with medicine. Laschinger and Leiter (2006) set out to test a theoretical model of professional nurse work environments. The sample consisted of 8,597 nurses practicing in Canada. Nursing leadership directly affected four domains of the Worklife Model (Laschinger & Leiter, 2006). The affected domains were: (1) quality of worklife regarding policy involvement; (2) staffing levels; (3) Support for a nursing model of care—versus a medical model of care; and (4) nurse/ physician relationships. The investigation used sequential equation modeling, suggesting that patient safety is related to the quality of the nurse practice environment and the nurse leader's role in altering the work environment.

Aiken et al., (2008) investigated the effects of nurse practice environment and staffing levels on patient safety outcomes. The study population included 10,184 nurses and 232,342 surgical patients in 168 hospitals in Pennsylvania. The study revealed that hospitals with lower nurse to patient ratios (less than 6:1) had significantly fewer patient deaths than hospitals with poor nurse staffing. Additionally, fewer deaths were reported in hospitals with a higher proportion of nurses with a Bachelors degree. In a subsequent study, Aiken et al. (2011) set out to uncover circumstances that contribute to patient safety, measured by 30-day surgical mortality rates. The study population spanned 665 hospitals across four states and linked data for 1,262,120 surgical patients. Additionally, a random sample surveyed 39,038 staff nurses. The results suggest that higher nurse-to-patient ratios increase mortality and failure-to-rescue—failure of delay in recognizing and responding to patient deterioration. However, improved work environments and higher levels of baccalaureate-prepared nurses decrease patient mortality (Aiken et al, 2011).

The Patient Safety Chain

"To achieve a chain reaction, charismatic transformational leaders espouse intellectual stimulation and individual consideration to empower staff and enhance patient care.
–Lorraine Murphy

The *patient safety chain* is a theoretical model with the tenant that the leadership on the patient ward or unit may positively or negatively affect patient safety. Loraine Murphy (2005) proposed that transformational leadership has a cascading positive effect on patient safety mainly from the transformational characteristics of intellectual stimulation and individual consideration. Murphy (2005) also suggests that disempowerment leads to indifference, thus impacting patient care. McFadden et al. (2009) surveyed more than 200 hospitals in the United States, seeking confirmation that the patient safety chain existed. The investigation provided evidence for the chain's existence to include transformational leadership that leads to a culture of safety and increasing safety activities that ultimately lead to patient safety outcomes. In a 2018 study into the *patient safety chain*, Fischer et al. (2018) sought to understand the mediating and moderating effects of the chain. Using a Delphi study methodology of 25 international authorities in academia, practice, and administration found that leadership commitment to safety, specifically senior leadership, is a crucial component of creating a culture of safety.

The ANCC Magnet Recognition Program®

"No institution becomes a Magnet and stays there without constant tending…. Maybe one of the most important issues is that a Magnet hospital is not just a nursing hospital it attracts and retains good people throughout the organization."
– Margaret L. McClure

The American Nurses Credentialing Center (ANCC) recognizes excellence in nursing practice globally. The vision of the Magnet Recognition Program is to "transform healthcare by bringing knowledge, skill, innovation, leadership, and compassion to every person, family, and community" (ANCC, n.d.- a). ANCC promotes the *Magnet Culture* through five domains of

exemplary professional nursing practice: Transformational Leadership, Structural Empowerment, New Knowledge, Innovation and Improvements, and Empirical Quality Results (ANCC, n.d. -d). Designation entails meeting all eligibility criteria in a written document and a site visit. Organizations are required to be redesignated every four years or forfeit Magnet status. Magnet organizations must have a Chief Nursing Officer with a minimum of a Masters degree. All nurse leaders within the organization must have a minimum of a Bachelors in Nursing degree to be eligible (ANCC, n.d. - c). The Magnet Journey is a term used by ANCC to recognize those organizations that are putting processes and structures in place to transform their culture and become Magnet-designated organizations (ANCC, n.d. - a).

Rodrigues et al. (2019) conducted a systemic review investigating quality indicators in Magnet-designated hospitals compared to hospitals that do not hold Magnet status. The study reported increased quality among Magnet organizations compared to non-Magnet-designated organizations, including lower job dissatisfaction and nurse turnover, leading to cost savings. Magnet hospitals in this investigation reported improved work environments and lower nurse-to-patient ratios. According to Rodrigues et al., Magnet hospitals are correlated with 5% fewer falls and 21% less pressure injury than non-Magnet hospitals. Additionally, lower mortality rates were found in several of the studies that were reviewed. Aiken et al. (2011) reported that many organizations that improved their work environments used the *Magnet Blueprint* as a guide for tackling challenging work environments and creating culture changes in nursing.

Summary

In Chapter 2, the theoretical framework was introduced. A review of the literature was presented that included the history of education in nursing, leadership, empowerment, and safety. Additionally, the American Nurses Credentialing Center's Magnet Recognition Program® was

explored. Chapter 3 will describe the methods for the investigation and include population, sample, a detailed review of each of the instruments, pilot study, the data collection procedures, protection of human subjects, and methods for data analysis.

Chapter 3: Methods

The investigation employed an observational one-sample research design to measure education levels, perceived leadership styles, levels of empowerment, and perceived culture of safety for the nurse manager subjects. The target population was nurse managers in urban and suburban settings. All subjects were asked to complete an on-line survey consisting of all the instruments described in this chapter.

Population and Sample

The targeted population for this investigation was nurse managers. The subjects were selected from a group of volunteer nurse managers employed in urban and suburban hospitals, clinics, and homecare agencies. The inclusion criterion for the targeted population was Professional Registered Nurses who hold the formal title of nurse manager or equivalent. All subjects were able to read and write in the English language. Subjects were targeted from various populations served in the acute care, clinic, and homecare settings that included but were not limited to critical care, medical-surgical, emergency services, perinatal, perioperative, procedural, psychiatry, and dialysis clinics. All subjects who volunteered and wished to participate in the study were included providing that they met the criteria of the investigation. This investigation had 142 nurse manager subjects complete an on-line survey.

Instruments

The instruments chosen for this investigation were the Multifactor Leadership Questionnaire (Avolio & Bass, 2004), the Conditions of Work Effectiveness Questionnaire II (Laschinger et al., 2001), and the Hospital Survey on Patient Safety Culture 2.0 (Agency for

Healthcare Research and Quality, 2019). Additionally, a demographic variable instrument was created by the investigator. Each instrument will be discussed in this section.

Multifactor Leadership Questionnaire

In 2004, Avolio and Bass published the Multifactor Leadership Questionnaire (MLQ-5X) (see Appendix A for sample questions and permission to use the MLQ5X instrument). The instrument can be used in leadership development as well as in academic and business research. It is rooted in the principle of transformational leadership. Avolio and Bass's MLQ-5X instrument measures a broad range of leadership styles. Full range leadership styles are inclusive of leaders who lead through Transformation, Transactions, and Passive Avoidant Behavior, such as Laissez-Faire and Management-by-Exception styles. The instrument can be used by both the individual leader as a self-assessment as well as to measure the followers' perceptions of the leader's style.

The MLQ-5X additionally measures outcomes of leadership or effective and ineffective leadership. The nurse manager subjects completed a Leader Form version of the instrument. A google scholar engine search of the MLQ-5X questionnaire demonstrated that the instrument has been used widely in nursing research (Scholar.google.com). The instrument takes approximately 5 minutes to complete.

Type of Instrument

Embedded within the four leadership styles measured by the MLQ-5X are 12 subscales. The instrument subscales of Transformational Leadership measures Idealized Attributes, Idealized Behaviors, Inspirational Motivation, Intellectual Stimulation, and Individual Consideration. Transactional Leadership style is comprised of two subscales: Contingent Reward and Management-by-Exception. Additionally, Passive-Avoidant Behavior is likewise subdivided

into two scales: Management-by-Exception and Laissez-Faire Leadership. Outcomes of Leadership contains three subscales aimed at assessing overall effectiveness of the leader, namely, Extra Effort, Effectiveness, and Employee Satisfaction with the Leadership (Avolio & Bass, 2004). The more transformational a leader is, the more likely the employee will have increased motivation to achieve the outcomes desired by the leader (Extra Effort). This extra effort leads to results beyond the leader's expectations. The transactional leader is not necessarily ineffective. The employee will expend extra effort and achieve the expected results of the leader (Avolio & Bass, 2004). The instrument comes in two forms: (1) a self-administered self-report that can be used by an individual leader or a corporate trainer, and (2) a scale to rate the performance of the leader/trainer by the followers. In this investigation, the nurse manager subjects completed the self-administered self-report Leader Form version of the instrument.

Number of Items

Avolio and Bass's Multifactor Leadership Questionnaire (2004) is available in two versions: the leader and the rater forms. For the purposes of this investigation, the leader form was applied. Both forms of the instrument, the self-administered Leader Form and the Rater Form completed by another, consist of 45 descriptive declarations, divided into 12 subscales, that measure Transformational, Transactional, Passive-Avoidant Behavior, and Outcomes of Leadership. For the variable of Idealized Influence, there are eight questions, four questions relate to Attributed Idealized Influence, and four questions each relate to Idealized Influence Behavior. Inspirational Motivation, Intellectual Stimulation, Individual Consideration, Contingent Reward, Management-by-Exception (Active), Management-by- Exception (Passive), Laissez-Fair Leadership, and Effectiveness. The variable of Extra Effort includes three questions, and Satisfaction has two questions attributed to the variable.

Task for Respondents

The study participants were required to complete 45 items of descriptive declarations on the questionnaire. All items not applicable to the participant should be left blank, including items the participant is unsure how to answer. The participant is asked to judge how often each declaration is true for the individual on a Likert-type ordinal scale that moves in increasing frequency from (0) not at all, (1) once in a while, (2) sometimes, (3) fairly often, and (4) frequently if not always. The leader is asked to complete a self-assessment of their leadership style on the MLQ-5X Leader Form. The Rater Form is intended to be completed by an individual that is higher in the organizational level than the person being rated, or an individual who is at the same level as the rater or an individual that is at a lower organizational level than the person being rated (Avolio & Bass, 2004). For the intent of this investigation, the Leader Form was completed by the nurse manager subjects as a self-assessment of their leadership style.

Scoring

The Multifactor Leadership Questionnaire (MLQ-5X) measures full-range leadership by calculating an average score for each subscale associated with a leadership style. Transformational Leadership contains five subscales: Idealized Influence (Attributes) (IA), Idealized Influence (Behavior) (IB), Inspirational Motivation (IM), Intellectual Stimulation (IS), and Individual Consideration (IC). Each of the four subscales in Transformational Leadership contains four questions. The Transformational Leadership sub-scale scores range from 0 to 4.

Transactional Leadership contains two sub-scales: Contingent Reward (CR) and Management-by-Exception (Active) (MBEA). Each of the two sub-scales in Transactional Leadership contains four questions. The Transactional Leadership sub-scale scores range from 0 to 4. Passive-Avoidant Leadership contains two sub-scales: Management-by- Exception

(Passive) (MBEP) and Laissez-Faire (LF). Each of the Passive-Avoidant Leadership sub-scales contains four questions. The Passive-Avoidant Leadership sub-scale scores range from 0 to 4.

Outcomes of Leadership contains three subscales: Extra Effort (EE), Effectiveness (EFF), and Satisfaction (SAT). The Extra Effort sub-scale contains three questions. The Effectiveness sub-scale contains four questions, whereas the Satisfaction sub-scale contains two questions. The Outcomes of Leadership sub-scale scores range from 0 to 4. The sums of the items that make up the subscales are divided by the number of items in the subscales. A subscale score is generated for each leadership style.

Leadership is not categorized as Transformational or Transactional, but rather depicted on a spectrum described as more than average or less than average for the measured subscale. The higher the score, the more the individual who is being rated (self or other) embodies the attributes of the variable.

The MLQ-5X instrument contains optional normative tables and percentile rankings that were used in this investigation to compare to the mean of the participants' descriptive statistics. See Table 1 for the MLQ-5X Leadership Styles, Subscales, Subscale Abbreviations, Number of Items, Subscale Score Ranges, and US Normative Means.

Instrument Development Procedures

In 1985, Bass developed the 6-factor model of leadership that served as the basis for the Multifactor Leadership Questionnaire version 1 (Avolio & Bass, 2004). The Multifactor Leadership Questionnaire has been revised several times since its inception, and the 9-factor model has been established on subsequent research. The Multifactor Questionnaire version 5X is the most current available instrument developed by Avolio and Bass in 2004.

Table 1

Multifactor Leadership Questionnaire: Correlating Sub-Scale Questions, and Sub-Scale Scores

Leadership Style	*Subscale*	*Subscale Abbreviation*	*Number of Items*	*Correlating Subscale Questions*	*Sub-Scale Score Range*	*US Normative Mean*
Transformational Leadership	Idealized Influence (Attributes)	IA	4	10, 18, 2, 25	0 to 4	2.94
	Idealized Influence (Behaviors)	IB	4	6, 14, 23, 34	0 to 4	2.77
	Inspirational Motivation	IM	4	9, 13, 26, 36	0 to 4	2.92
	Intellectual Stimulation	IS	4	2, 8, 30, 32	0 to 4	2.78
	Individual Consideration	IC	4	15, 19, 29, 31	0 to 4	2.85
Transactional Leadership	Contingent Reward	CR	4	1, 11, 16, 35	0 to 4	2.87
	Management-by-Exception: (Active)	MBEA	4	4, 22, 24, 27	0 to 4	1.67
Passive-Avoidant Behavior	Management-by Exception: (Passive)	MBEP	4	3, 12, 17, 20	0 to 4	1.03
	Laissez-Faire	LF	4	5, 7, 28, 33,	0 to 4	0.65
Outcomes of Leadership	Extra Effort	EE	3	39, 42, 44	0 to 4	2.74
	Effectiveness	EFF	4	37, 40, 43, 45	0 to 4	3.07
	Satisfaction	SAT	2	38, 41	0 to 4	3.08

Source: Avolio, B.J., & Bass, B.M. (2004). Multifactor Leadership Questionnaire (p. 121). MLQ International Normative Samples Table 10a (US) Copyright 2004, by Mind Garden, Inc.

Reliability and Validity

The authors of the Multifactor Leadership Questionnaire (MLQ-5X) have extensive research, suggesting that the instrument has high construct validity and is reliable for measuring

leadership. The Cronbach alpha reliabilities ranged from $\alpha = .74$ to $\alpha = .94$, suggesting that the MLQ-5X is a reliable instrument.

Permission

The Multifactor Leadership Questionnaire (MLQ-5X) is a copyrighted instrument. Permission to use the instrument is granted by request from a third party. For the purposes of the intended investigation, the MLQ-5X manual was purchased with permission for a non-reproducible copy of the instrument for inclusion in the current study (please refer to Appendix A).

Conditions of Work Effectiveness Questionnaire II

In 2001, Laschinger et al. published the Conditions of Work Effectiveness Questionnaire II (CWEQ-II). The CWEQ-II measures the Structural Empowerment of an individual in the workplace. The instrument is based on Kanter's (1977) theory of structural empowerment. Laschinger et al. (2001) developed an expanded workplace model that incorporated structural empowerment, psychological empowerment, and positive work behaviors and attitudes. The CWEQ-II instrument measures Structural Empowerment through an individual's perception of Opportunity, Information, Support, and Resource Access in the work environment. A search of the Cumulative Index to Nursing and Allied Health database revealed that the CWEQ-II instrument has been extensively studied in nursing, with adaptations in numerous languages and cultures. The instrument takes approximately 4 minutes to complete.

Type of Instrument

The Conditions of Work Effectiveness Questionnaire II (CWEQ-II) (Laschinger et al., 2001) contains six subscales: namely, Access to Opportunity, Access to Information, Access to Support, Access to Resources, Formal Power, and Informal Power. A Total Structural

Empowerment score and a Global Empowerment score are generated from the six subscales. Global Empowerment characterizes the perceptions of an empowered work place. The Conditions for Work Effectiveness Questionnaire-II (Appendix B) is a self-administered, self-report instrument. The instrument was administered to the nurse manager subjects.

Number of Items

The Conditions for Work Effectiveness Questionnaire (Laschinger et al., 2001) contains 21 descriptive questions that measure Structural Empowerment. The first four subscales—Access to Opportunity, Access to Information, Access to Support and Access to Resources—each contain three questions. The Job Activities Scale on the instrument measures Formal Power and also consists of three questions. The Organizational Relationship Scale measures Informal Power and contains four items, while the Global Empowerment scale contains two questions.

Task for Respondents

The participants are required to answer all 21 questions that are presented on the questionnaire. The respondent is asked to choose a score based on a Likert-type ordinal scale that moves in increasing frequency from 1 to 5, where (1) is equivalent to None, (3) is equivalent to Some, and (5) is equivalent to A Lot. For the intent of this investigation, the nurse manager subjects were asked to complete the CWEQ-II instrument (Laschinger et al., 2001).

Scoring

The Conditions of Work Effectiveness Questionnaire II instrument (CWEQ II) (Laschinger et al., 2001) measures empowerment by calculating an average score of the subscales Access to Opportunity, Access to Information, Access to Support, Access to Resources, and the Job Activities scale. These subscales include three items each, with a score range from 1 to 5. The subscale scores are added and then divided by the number of items in the

subscale for a mean subscale score. The Organizational Relationships scale includes four items, with a score range of 1 to 5. The subscale scores are added, then the sum is divided by the number of items in the subscale for a mean subscale score. Total Structural Empowerment includes the sums of the subscales, Access to Opportunity, Access to Information, Access to Support, Access to Resources, Job Activities, and Organizational Relationships. The total Structural Empowerment score ranges from 6 to 30, with higher scores correlating to increased Structural Empowerment, while moderate empowerment scores range from 14 to 22 and low empowerment is represented by scores ranging between 6 to 13 (Khan et al., 2018; Laschinger, 2012). The Global Empowerment scale includes two items, with a score range from 1 to 5. The subscale scores are added, and their sum is divided by the number of items in the subscale for a mean subscale score. The Global Empowerment score is a validity check for the Conditions of Work Effectiveness Questionnaire II (Laschinger, 2012). For the purposes of this investigation, the Total Structural Empowerment Score was used. See Table 2 for the CWEQ II sub-scales, scoring, scoring range, and number of items.

Instrument Development Procedures

The Conditions of Work Effectiveness Questionnaire II (CWEQ-II) (Laschinger et al., 2001) is a revision of the original Conditions of Work Effectiveness Questionnaire I (CWEQ-I). Both the CWEQ-I and the CWEQ-II are based on Kanter's (1977) theory of structural empowerment. The theory divides power into four factors: systemic power, access to job related empowerment structures, personal impact on employees, and work effectiveness. Laschinger et al. (2001) developed and expanded Kanter's empowerment model to include structural empowerment, psychological empowerment, and positive work behaviors and attitudes (Laschinger, 2012). In 2001, Laschinger et al. conducted a study that employed structural

Table 2

Scoring of The Conditions of Work Effectiveness Questionnaire II

Sub-Scale	***Scoring***	***Score Range***	***Number of Items***
Access toOpportunity	Sum of items divided by the number of items	1 to 5	3
Access to Information	Sum of items divided by the number of items	1 to 5	3
Access to Support	Sum of items divided by the number of items	1 to 5	3
Access to Resources	Sum of items divided by the number of items	1 to 5	3
Job Activities Scale	Sum of items divided by the number of items	1 to 5	3
Organizational Relationships Scale	Sum of items divided by the number of items	1 to 5	4
Total Structural Empowerment	Sum of Subscale Scores	6 to 30	19
Global Empowerment	Sum of items divided by the number of items	1 to 5	2

Source: Laschinger, H.K., Finegan, J., Shamian, J., & Wilk, P. (2001). Impact of structural and psychological empowerment on job strain in nursing work settings: Expanding Kanter'smodel. *Journal of Nursing Administration*, 31(5), 260-272.

equation modeling that tested Laschinger's expanded model. The investigation indicated that structural empowerment had a positive effect on staff nurses' psychological empowerment of meaning, confidence, autonomy, and impact (Laschinger et al., 2001). The study further suggested that positive structural empowerment led to job satisfaction, while negative structural empowerment led to job strain and burnout. The CWEQ-II is the most currently available instrument developed by Heather Laschinger.

Reliability and Validity

Laschinger et al. (2001) demonstrated construct validity of the Conditions of Work Effectiveness Questionnaire-II using factor analysis. Further, the global empowerment measurement was added to the instrument as a validation index. The Cronbach alpha reliabilities for the subscales of the Conditions of Work Effectiveness II instrument ranged from $\alpha = .69$ to $\alpha = .89$ (Laschinger et al., 2000). The Conditions of Work Effectiveness Questionnaire-II is considered to be a reliable and valid instrument for use in this research.

Permission

The Conditions of Work Effectiveness Questionnaire (Laschinger et al., 2001) is a free instrument that is publicly available from Western University located in California. Heather Laschinger, Ph.D. passed away in 2016, leaving the Conditions of Work Effectiveness Questionnaire I and II openly available as part of her legacy of work (see Appendix B).

Hospital Survey on Patient Safety Culture

The Hospital Survey on Patient Safety Culture (HSOPS) measures patient safety attitudes and behaviors that are supported and accepted by the individuals within the hospital work group (Agency for Healthcare Research and Quality [AHRQ], 2019). The survey instrument is intended to assist hospitals in assessing their staff for a safe patient culture and has been used by hundreds of hospitals in the United States (AHRQ, 2019; Reis, 2018). The instrument is also used for research purposes. A search of the National Library of Medicine revealed 39 national and international investigations using the HSOPS instrument. For the purposes of this investigation, HSOPS 2.0 was used to measure the culture of safety of the nurse manager subjects. The survey takes approximately 5 minutes to complete.

Type of Instrument

The instrument is a 40-item survey that contains ten subscales referred to as composite measures, namely, Communication about Error; Communication Openness; Handoffs and Information Exchange; Hospital Management Support for Patient Safety; Organizational Learning–Continuous Improvement; Reporting Patient Safety Events; Response to Error; Staffing and Work Pace; Supervisor, Manager, or Clinical Leader Support for Patient Safety; and Teamwork. The questionnaire is a self-administered self-report instrument. For the purposes of this investigation, the nurse managers completed the subscales Total Communication about Error, Total Communication Openness, Total Management Support for Patient Safety, and Total Teamwork. See Appendix C for sample questions of the HSOP.

Task for Respondents

For the purposes of this investigation, the study participants were required to complete 13 of the 34 items from four subscales of the survey. Demographic and background questions were eliminated from the Hospital Survey on Patient Safety (AHRQ, 2019) survey and captured in the Demographic Questionnaire developed by this investigator. The survey items are segmented into subsections that result in ten subscales that are interrelated for the individual to complete. The instrument contains four different Likert-type ordinal scales for different subsections (see Table 3). For section A–Your Work Unit, Section B–Your Supervisor, Manager, or Clinical leader, and Section F–Your Hospital, the participants are tasked with answering the survey questions on a Likert-type ordinal scale that moves from 1 to 5, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree or Disagree, 4 = Agree, and 5 = Strongly Agree. Section C–Communication and Section D–Reporting Patient Safety Events contain a Likert-type ordinal scale that moves from 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Most of the Time, and

5 = Always. In Section D, item 3 requests a frequency of events where a = none, b = 1 to 2, c = 3 to 5, d = 6 to 10, and e = 11 or more. Section E of the questionnaire, Patient Safety Rating, uses a Likert type ordinal scale that moves as follows: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, and 5 = Excellent. Additionally, the individual can choose 'does not apply' or 'don't know' to all questions except Section D item 3 and Section E item 1. Items are listed both negatively and positively to decrease an acquiescent response set (AHRQ, 2019).

Scoring

The instrument scoring for the Hospital Survey on Patient Safety Culture 2.0 (HSOPS) (AHRQ, 2019) calculates the frequency of responses for each item. For scoring purposes, negatively phrased items are reversed to generate a positive score (AHRQ, 2019). Omitted items are excluded in the frequency calculations. See Table 3 for HSOPS subscale items and scoring scales.

Table 3

Hospital Survey on Patient Safety Culture 2.0 Subsection Items and Scoring Scales

HSOPS Questionnaire Sections	***Number of Sub-Scale Items***	***Scoring Scale***
Section A: Your Unit/Work Area	14	5 pt. Likert-type ordinal scale:Strongly Disagree to Strongly Agree
Section B: Your Supervisor, Manager, or Clinical Leader	3	5 pt. Likert-type ordinal scale:Strongly Disagree to StronglyAgree
Section C: Communication	7	5 pt. Likert-type ordinal scale:Never to Always
Section D: Reporting Patient Safety Events	3	For Items 1 & 2: 5 pt. Likert-type ordinal scale Never to Always For item 3: frequency of events: None to 11 or more
Section E: Patient Safety Rating	1	5 pt. Likert-type ordinal scale:Poor to Excellent
Section F: Your Hospital	6	5 pt. Likert-type ordinal scale:Strongly Disagree to StronglyAgree
Total Subscale Items	34	

Source: Adapted from the Agency for Healthcare Research and Quality. (2019). Hospital SurveyVersion 2.0. Users guide. https://www.ahrq.gov/sop/surveys/hospital/index.html

Instrument Development Procedures

The development of the Hospital Survey on Patient Safety Culture (AHRQ, 2016) was jointly sponsored by the Agency for Healthcare Research and Quality (AHRQ) and the Quality Interagency Coordination Task Force- Medical Errors workgroup. The survey was specifically designed for use in hospitals to measure hospital staff members' views on the culture of safety in the organizations where they work (AHRQ, 2016). AHRQ contracted the research corporation Westat to design the survey. Westat reviewed the literature on hospital safety characteristics, existing culture of safety surveys, medical errors, and organizational culture. The Joint Commission, patient safety expert researchers, hospital system administration, and professional organizations contributed to draft survey items. Furthermore, Westat performed interviews with patient safety experts as well as hospital staff input for the draft survey. Cognitive interviews were conducted with various hospital staff members of the interdisciplinary team, including nurses, providers, unit clerks, and administration, to measure draft survey items (AHRQ, 2016).

The Survey pilot consisted of 21 hospitals throughout the United States, with approximately 1,400 employees completing the survey. A psychometric analysis of the survey concluded that the final items and composites of the instrument have positive psychometric properties (AHRQ, 2016). The Hospital Survey on Patient Safety Culture 2.0 (HSOPS) is a modification from the original 2004 Survey 1.0 questionnaire. The original survey consisted of 12 subscales referred to as composites, whereas the HSOPS 2.0 contains 10 composite categories (AHRQ, 2016). Both forms of the survey are currently available for use through AHRQ.

Reliability and Validity

The Hospital Patient Survey on Safety Culture (AHRQ, 2016) has been used extensively in hospitals across the United States and abroad by organizations and individuals participating in

the evaluation of the culture of safety in hospitals. More than 60 countries have reported using the HSOPS survey instrument, and it is available in more than 30 different languages that are supported by transcultural adaptations studies (Reis et al., 2018). The Cronbach alpha reliabilities for the Hospital Patient Survey on Safety Culture 2.0 composite sub-scales ranged from $\alpha = .67$ to $\alpha = .89$. The Staffing and work pace subscale fell below the acceptable Cronbach alpha of .70; however, all other composites were above $\alpha = .72$. (AHRQ, n.d.-b; Sorra & Dyer, 2003). Overall, the instrument is psychometrically sound and is appropriate for use in this investigation.

Permission

The instrument is in the public domain and is available for use and reprinting without permission for noncommercial purposes in the United States (AHRQ, 2019) (see Appendix C).

Demographic Characteristics Questionnaire

A Demographic Characteristics Questionnaire was developed by this investigator for use in this investigation to compare and contrast variables among the study participants (see Appendix D for the Nurse Manager Demographic Survey). The demographic items included for the nurse manager subjects are: (1) age, (2) gender, (3) race or ethnicity, (4) highest academic level held, (4a) if Masters or Doctoral, Concentration of degree, (5) specialty certification held, (6) years holding the title nurse manager, (7) type of unit managed, (8) size of staff managed in FTEs, (9) hospital setting - suburban or urban, and (10) Magnet and non-Magnet organization designation.

Data Collection Procedures

Data collection for this investigation included each participant completing four questionnaires. The nurse managers completed the Multifactor Leadership Questionnaire, leader

form (Avolio & Bass, 2004), the Conditions for Work Effectiveness Questionnaire II (Laschinger, 2012), the Hospital Survey on Patient Safety Culture 2.0, and a Nurse Manager Demographic Questionnaire. The total time for completing the survey was seven to ten minutes.

Recruitment of nurses to participate in the investigation occurred in two phases: (1) professional social media recruitment, and (2) participant recruitment at the 2022 American Nurses Credentialing Center (ANCC) Magnet/Pathways conference in Philadelphia, Pennsylvania on October 13, 14, and 15, 2022. The recruitment of willing nurse managers on public and private social media platforms, including LinkedIn and the Magnet Learning Community, occurred in October of 2022, one week before the ANCC Magnet/Pathways conference. Unanticipated snowball sampling on professional social media platforms that shared the study link occurred. The professional media platforms that shared the link included the Greater New York Black Nurses Association, the Philippine Nurses Association of America, and several nurse influencers promoting the link to the study across different professional media platforms, primarily LinkedIn. The survey link closed two weeks post the conference on October 29, 2022.

The investigator inquired with ANCC to attend the Magnet/Pathways conference as a vendor to collect data for the study. After a panel at ANCC reviewed the request and the research topic, the researcher was permitted to purchase a booth at the Philadelphia Convention Center with the intent to collect data. The researcher was informed by ANCC that student nurse research at the conference had not previously been permitted and that this would serve as a pilot project. The conference attendance exceeded 11,000 nurse leaders from practice, academia, and industry.

An informational booth was set up in the ANCC conference exhibitor hall displaying the researcher's name. A table was set up with informational flyers that contained the purpose of the

research, eligibility criteria, and participants' time estimation for the online survey (see Appendix E for the flyer). A quick response (QR) code to participate online was included for ease of accessing the survey. Additionally, an Apple Watch was offered to three randomly selected participants as an incentive to all participants recruited at the conference or on social media to complete the survey. Two volunteers assisted at the table, handing out flyers. Any potential participant who requested additional information was funneled to the study investigator.

The investigation used an on-line survey created on Teachers College, Columbia University's domain of Research Electronic Data Capture (REDCap). REDCap is a secure web application designed for creating and managing online surveys. The survey was available in a web form and a mobile application form. The survey instruments, Multifactor Leadership Questionnaire (MLQ-5X) (Avolio & Bass, 2004), the Conditions for Work Effectiveness Questionnaire II (CWEQ-II) (Laschinger, 2012), the Hospital Survey on Patient Safety Culture 2.0 (HSOPS) (AHRQ, 2019), and a Nurse Manager Demographic Questionnaire were administered by means of REDCap.

The data file was password-protected to ensure the security of the data. REDCap has advanced de-identification options. This study de-identified the subjects' names and email addresses. The data are reported in aggregates, and all subjects' identities are available only to the investigator. All REDCap data will be deleted upon completion of the doctoral requirements. Participants completed an online survey consent with the option to close the browser at any point in the survey process (see Appendix F). One hundred forty-eight nurse managers opened the survey, and 142 eligible respondents completed the survey.

The Teachers College Institutional Review Board (IRB) reviewed the investigation protocol. The study received full approval under expedited review, IRB 21-246, on October 13,

2021. The protocol was extended on September 28, 2022, IRB 21-426 (see Appendix G for the expedited review approval and the continued review approval letters). The Teachers College IRB ensured that the investigation would be conducted ethically and in compliance with all applicable requirements. This investigator has an updated Collaborative Institutional Training Initiative (CITI) training certificate on Mentor IRB as required by Teachers College, Columbia University.

Data Analysis

The research questions emanating from the Purposes of this investigation are presented here. The various statistical analyses that were conducted to examine the collected data related to the research questions will follow.

1. Does nurse manager education matter? Are nurse managers with more relevant education more transformational in their leadership style as indicated in the Multifactor Leadership Questionnaire (MLQ-5X) instrument (Avolio & Bass, 2004)? The subscales are transformational, transactional, passive-avoidant behavior, and outcomes of leadership.
2. Do nurse managers with more relevant education create structural empowerment and a sense of empowerment in their subordinates as indicated in the Conditions for Work Effectiveness Questionnaire II (CWEQ-II) (Laschinger et al., 2012). The six-subscale version of the instrument will be used in the study; the subscales are designed to assess perceptions, namely, access to opportunity, access to information, access to support, and access to resources.
3. Do nurse managers with more relevant education create a culture of safety within the work unit, as indicated by the Hospital Survey on Patient Safety Culture (HSOPS) 2.0 (Agency for Healthcare Research and Quality, 2019). The HSOPS 2.0 measures ten

subscales; for the purpose of this investigation, four subscales were explored, namely, Communication About Error, Communication Openness, Hospital Management Support for Patient Safety, and Teamwork.

A correlational analysis investigating the demographic characteristics of the nurse manager subjects using two-way tables was performed. Descriptive statistics for the three main variables, namely, leadership styles, total structural empowerment, and culture of safety, to investigate the relationships to the demographic variables was conducted. A multivariate analysis of variance (MANOVA) was performed, after the two-way tables, to assess if mean differences exist on leadership style, structural empowerment, and patient safety culture by the levels of nurse manager education. Additionally, an Analysis of Variance (ANOVA) for the variables was explored. The data were assessed for survey completeness and eligibility. All surveys that met the investigation's criteria were included in the analysis of the data. A statistics committee member provided guidance for the analysis of data.

Summary

Chapter 3 presented the methodology that was used in this investigation. The population and sample surveyed were introduced. The instruments chosen for the investigation were explained for the purpose of this study. Data collection procedures, protection of human subjects, and data analysis were described for this investigation. Chapter 4 will contain the results of the study.

Chapter 4: Results

This chapter begins with a presentation of the analysis of participant demographics. The presentation of results follows, addressing the research questions, which explore the relationships among nurse manager levels of education and leadership style, empowerment, and culture of safety. Each research section will begin with the instrument descriptive statistics of the study participants. The instruments are the Multifactor Leadership Questionnaire 5X (MLQ-5X) (Avolio & Bass, 2004), the Conditions of Workforce Effectiveness Questionnaire II (CWEQ-II) (Laschinger et al., 2001), and the Hospital Survey on Patient Safety (HSOPS) (Agency for Healthcare Research and Quality, 2019). A further analysis was conducted examining the American Nurses Credentialing Center's Magnet Recognition Program® status variable with Leadership Style, Empowerment, and Culture of Safety.

Data Collection and Response

A total of 148 participants completed the survey online through a REDCap survey link embedded in a Quick Response (QR) code on flyers handed out during the 2022 ANCC Magnet/ Pathways Conference in Philadelphia, Pennsylvania, and posted on LinkedIn. A snowball sample effect of sharing the QR code occurred at the conference and online. Of the 148 completed surveys, four were deemed ineligible due to not meeting the study criteria for a nurse manager, and two surveys were incomplete and therefore excluded. One hundred forty-two surveys were considered eligible for analysis in this study. The Survey opened on October 6, 2022, and closed on October 29, 2022. All data analyses were performed using the Statistical Package for the Social Sciences [SPSS] 2022 version of IBM® SPSS® 29 (SPSS, Inc., Chicago, IL).

Participant Demographics

The nurse managers who participated in the investigation*, Does Education Matter? Nurse Manager Leadership Style, Empowerment and Perceptions of Culture of Safety*, completed a demographic questionnaire authored by the investigator. The most common age ranges in years of participants (*N* = 142) were 36 to 45 (*n* = 46, 32.4%) and 46 to 55 (*n* = 46, 32.4%). The two age ranges accounted for 68.8% of the study population. The predominant gender identified was female (*n* = 131, 92.3%), with males comprising (*n* = 11, 7.7%), consistent with the norms of the nursing profession. The dominant race and ethnicity identified as white (*n* = 119, 83.8%), Black or African American (*n* = 9, 6.3%), and Asian (*n* = 4, 2.8%). Other accounted for (*n* = 3, 2.1%), American Indian or Alaska Native *(n* = 1, 0.7%), Prefer not to answer accounted for (*n* = 2, 1.4%), and 3 of the 142 participants left the race and ethnicity question blank.

The participants in this investigation represented a highly educated nursing workforce, inconsistent with the reported industry norms. The majority of the nurse managers had obtained a Masters degree (*n* = 82, 57.7%), followed by Bachelors degree (*n* = 34.5%) and a Doctoral degree (*n* = 9, 6.3%). Only one participant identified as having an Associate degree as the highest level of educational attainment (*n* = 1, 0.7%). Of those subjects that held a Masters degree as their highest level of education, the majority held their degree in Nursing Administration (*n* = 45, 55.5%). The predominant Doctoral degree was the DNP in Leadership (*n* = 7, 77.8). The majority of participants held a specialty certificate (75%) with a clinical certification dominant (*n* = 73, 68%), followed by other health care certification (*n* = 34, 32%). A certification in Administration accounted for 31 (29%) of the certifications. Of note, 31 participants had dual clinical and administrative certifications. The total number of certifications obtained by the nurse managers was 138.

Nearly 75% of the nurse managers sampled had under 10 years of experience, with 1 to 4 years (n = 75, 53%) and 5 to 9 years (n = 30, 21%), respectively. The depth of experience of nurse managers with 10 to 24 years accounted for 24.5% of the sample. Most of the nurse managers worked in organizations designated as Magnet (n = 98, 69%), followed by organizations that were on the journey to becoming Magnet-designated facilities (n = 25, 17.6%). A few nurse managers answered no or did not know if they worked in a Magnet-designated facility (n = 19, 13.4%). The most common practice setting was Suburban (n = 66, 46.5%), followed by Urban (n = 52, 36.9%) and rural (19, 13.4%), respectively. See Table 4 for a comprehensive overview of the demographic characteristics of the nurse manager participants in the investigation.

The most frequent specialty managed in this sample was medical surgical Adult (n = 54, 38%), followed by Adult ICU (n = 15, 10.6%) and Clinic nurse managers (n = 12, 8.5%). Perioperative and procedural nurse managers in this investigation accounted for 14.7% of the participants (n = 11, 7.7% and n = 10, 7%, respectively). See Appendix H for more detailed information. Eleven nurse managers (7.7%) managed more than one area. The nurse managers in the study led teams that most frequently consisted of 70 or more full-time equivalents (FTEs) (n = 3, 21.8%) followed by 10 to 19 FTEs (n = 22, 15.5%). Sixteen nurse managers managed 1 to 9 FTEs (11.3%). See Appendix I for additional information.

Table 4

Demographic Characteristics of the Nurse Manager Participants

Demographic Characteristic	*f*	%	Cumulative %
Age Range			
25 - 35	18	12.7	12.7
36 - 45	46	32.4	45.1
46 - 55	46	32.4	77.5
56 - 65	31	21.8	99.3
66+	1	0.7	100
Gender			
Female	131	92.3	92.3
Male	11	7.7	100
Race & Ethnicity			
American Indian or Alaska Native	1	0.7	0.7
Asian	4	2.8	3.6
Black or African American	9	6.3	10.1
Hispanic or Latino	1	0.7	10.8
White	119	83.8	96.4
Other	3	2.1	98.6
Prefer not to Answer	2	1.4	100
Chose not to answer the question	3	2.1	
Highest Academic Level			
Associate	1	0.7	0.7
Bachelors	49	34.5	35.5
Masters	82	57.7	93.6
Doctoral	9	6.3	100
Chose not to answer the question	1	0.7	

Table 4 (continued)

Demographic Characteristic	*f*	%	Cumulative %
Type of Masters Degrees Held			
Nursing Administration	45	55.5	55.6
Nursing Education	11	13.6	69.1
Nurse Practitioner	5	6.2	75.3
MBA	6	7.4	82.7
Other	14	17.3	100
Type of Doctoral Degrees Held			
PhD	1	11	11.2
DNP- Clinical	1	11	22.2
DNP – Leadership	7	77.8	100
Hold a specialty certification?			
Yes	110	78	78.6
No	31	22	100
Chose not to answer the question	1	1.4	
Category of Certifications Held[1]			
Clinical	73	53	53
Administration	31	22	75
Other Health Care	34	25	100
Years as a Nurse Manager			
1 – 4	75	53	53
5 – 9	30	21	74.5
10 – 14	21	15	89.4
15 – 19	10	7	96.5
20 – 24	5	3.5	100
Chose not to answer the question	1	0.7	

Table 4 (continued)

Demographic Characteristic	*f*	%	Cumulative %
Magnet Status[2]			
Yes	98	69	69
On the Journey[3]	25	17.6	86.6
No, or Not Sure	19	13.4	100
Practice Setting			
Urban	52	36.9	36.9
Suburban	66	46.5	83.7
Rural	19	13.4	97.7
Other	4	2.8	100
Chose not to answer the question	1	0.7	

Note. $N = 142$ for each characteristic.

[1]Total number certification held by nurse managers, $N = 138$. Thirty-one nurse managers held dual certifications in the sample population.

[2]The Magnet status of participant's organizations.

[3]Journey refers to organizations that are in the process of putting the Magnet structure in place.

Research Questions and Analyses

The research questions emanated from the purposes of this investigation. The investigator's interest in levels of nursing education within the profession and the patient safety chain of transformational leadership of the nurse manager leading to empowerment that ultimately leads to increased patient safety activities drove the formation of the research questions and the instruments chosen for the study. How does a nurse manager's level of education influence the patient safety chain? Additionally, Magnet designation promotes a transformational leadership style, structural empowerment, and a patient safety culture rooted in quality outcomes. Magnet organization nurse managers are minimally Bachelors prepared. The

opportunity to investigate nurse managers who work in Magnet and non-Magnet organizations arose when the opportunity to collect data at the American Nurses Credentialing Centers' annual Magnet/Pathways conference was actualized. The results of the statistical analyses for each research question in this study will be presented separately. Each major area of research will begin with the instrument descriptive statistics of the study participants.

Nurse Manager Education and Leadership Style

The Multifactor Leadership Questionnaire (MLQ-5X) descriptive statistics are presented followed by the research questions. There are three research questions pertaining to education and the leadership styles measured by the MLQ-5X instrument—namely, Transformational Leadership, Contingent Reward, and Outcomes of Leadership. Instrument descriptive statistics for each question are presented. Following the instrument descriptive statistics are the research questions and analyses. Measures of Central Tendency, Skewness, Kurtosis and MLQ-5X U.S. Normative values are presented in Table 5.

Research Question Number 1a. Does Education Matter?

Are Nurse Managers with more relevant education more transformational in their leadership style, as indicated in the Multifactor Leadership Questionnaire (MLQ-5X) instrument? See Table 6 for the descriptive statistics for the MLQ-5X subscales by level of education.

Table 5

Multi-Leadership Questionnaire 5X (MLQ-5X) Participant Descriptive Statistics

Subscale	*N*	Min	Max	*M*	*SD*	Skewness		Kurtosis		Norms
Individualized Influence	142	1.00	3.0	2.75	.356	-1.91	.203	4.5	4.0	2.94
Idealized Behaviors	142	1.25	3.0	2.82	.294	-2.37	.203	7.12	.404	2.77
Inspirational Motivation	142	1.50	3.0	2.89	.258	-3.13	.203	10.9	.404	2.92
Intellectual Stimulation	142	2.0	3.0	2.85	.212	-1.37	.203	1.44	.404	2.78
Individual Consideration	142	1.5	3.0	2.91	.213	-3.33	.203	14.6	.404	2.85
Contingent Reward	142	1.0	3.0	2.71	.377	-1.69	.203	3.60	.404	2.87
Management by Exception Active	142	00	2.75	1.50	.585	-.414	.203	-.229	.404	1.67
Management by Exception Passive	142	00	2.25	.555	.507	1.03	.203	1.00	.404	1.03
Laissez Faire	142	00	2.25	.947	.405	.650	.203	.980	.404	0.65
Extra Effort	142	1.67	4.00	3.08	.611	-.283	.203	1.34	.404	2.74
Effectiveness	142	1.00	4.00	3.34	.602	-1.05	.203	.375	.404	3.07
Satisfaction	142	1.50	4.0	3.35	.513	-.710	.203	.375	.404	3.08

Note. $N = 142$. Norms refers to Avolio, B.J., & Bass, B.M. (2004), Multifactor Leadership Questionnaire (p. 121). MLQ International Normative Samples Table 10a (US) Copyright 2004, by Mind Garden, Inc.

The Transformational Leadership scale in the Multifactor Leadership Questionnaire (Avolio & Bass, 2004) contains five subscales, namely, Idealized Influence, Idealized Behaviors, Inspirational Motivation, Intellectual Stimulation, and Individual Consideration. A Cronbach's alpha indicated that the internal consistency was acceptable for Transformational Leadership ($\alpha = .734$). A Pearson correlation analysis indicated that there was a strong positive and significant correlation between the transformational Leadership variables. See Table 6 for Pearson correlation results among the Transformational Leadership Independent Variables.

Table 6

Pearson Correlation Results Among Idealized Influence (IA), Idealized Behavior (IB), Inspirational Motivation (IM), Intellectual Stimulation (IS), and Individual Consideration (IC)

Subscale		(IA)	IB	(IM)	(IS)	(IC)
IA	Pearson Correlation	1	.339**	.444**	.214*	.294**
	Sig. (2-tailed)		<.001	<.001	.011	<.001
	N	142	142	142	142	142
IB	Pearson Correlation	.339**	1	.412**	.338**	.444**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001
	N	142	142	142	142	142
IM	Pearson Correlation	.444**	.412**	1	.369**	.552**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001
	N	142	142	142	142	142
IS	Pearson Correlation	.214*	.338**	.369**	1	.391**
	Sig. (2-tailed)	.011	<.001	<.001		<.001
	N	142	142	142	142	142
IC	Pearson Correlation	.294**	.444**	.552**	.391**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	
	N	142	142	142	142	142

Note: *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Table 7

Descriptive Statistics for Transformational Leadership by Level of Education

Subscales	Level of Education	*M*	*SD*	*N*
Idealized Influence	Associate & Bachelors	2.71	0.40	50
	Masters	2.77	0.32	82
	Doctoral	2.75	0.38	9
	Total	2.75	0.35	141
Idealized Behaviors	Associate & Bachelors	2.82	0.25	50
	Masters	2.82	0.31	82
	Doctoral	2.91	0.18	9
	Total	2.82	0.28	141
Inspirational Motivation	Associate & Bachelors	2.89	0.27	50
	Masters	2.88	0.26	82
	Doctoral	3.00	0.00	9
	Total	2.89	0.26	141
Intellectual Stimulation	Associate & Bachelors	2.86	0.20	50
	Masters	2.83	0.22	82
	Doctoral	2.91	0.18	9
	Total	2.85	0.21	141
Individual Consideration	Associate & Bachelors	2.93	0.15	50
	Masters	2.89	0.25	82
	Doctoral	3.00	0.00	9
	Total	2.90	0.21	141
Individual Consideration	Associate & Bachelors	2.93	0.15	50
	Masters	2.89	0.25	82
	Doctoral	3.00	0.00	9
	Total	2.90	0.21	141

Note. $N = 141$. There was one instance of Associate prepared nurse manager that collapsed into the Bachelors category.

A one–way Multivariate Analysis of Variance (MANOVA) was performed to predict Transformational Leadership Style (Idealized Influence (IA), Idealized Behaviors (IB), Inspirational Motivation (IM), Intellectual Stimulation (IS), and Individual Consideration (IC)

with education. Due to the small number of Associates degree *(n* =1) and Doctoral degree (*n* = 9) prepared nurse managers in the sample, the education category was manipulated. Undergraduate includes Associate and Bachelors (*n* = 50), and Graduate includes Masters and Doctoral (*n* = 91). Table 8 includes the descriptive statistics for the dependent variable disaggregated by the independent variables for levels of education.

Table 8

Descriptive Statistics for Transformational Leadership by Level of Education

					95% Confidence Interval	
Subscale	Level of Education	*M*	SD	*SE*	Lower Bound	Upper Bound
IA	Undergraduate	2.71	.40	.050	2.62	2.81
	Graduate	2.78	.32	.037	2.70	2.85
IB	Undergraduate	2.82	.25	.040	2.74	2.90
	Graduate	2.83	.30	.030	2.78	2.89
IM	Undergraduate	2.90	.27	.037	2.82	2.97
	Graduate	2.89	.25	.027	2.84	2.95
IS	Undergraduate	2.86	.20	.030	2.80	2.92
	Graduate	2.85	.22	.022	2.80	2.89
IC	Undergraduate	2.93	.15	.030	2.87	2.99
	Graduate	2.90	.24	.022	2.85	2.94

Note. Total *N* = 14. Undergraduate is Associate and Bachelors prepared. Graduate is Masters and Doctoral Prepared.

For the one-way MANOVA, preliminary assumption testing was conducted. There were multiple univariate outliers as assessed by examination of the boxplot. The Shapiro–Wilk test of univariate normality was performed and indicated that the assumption of normality is violated ($p < .001$). However, the MANOVA is reasonably robust to modest violations of normality when

the sample size is at least 20 in each cell (Tabacknick & Fidell, 2018, p. 210). Mahalanobis distance was used to assess multivariate outliers; the critical value of 20.52 was exceeded in 6 cases (max. value = 48.26). The univariate and multivariate outliers were left in the model. Box's M test indicated that the assumption of homogeneity of variance-covariance was not met, $M = 44.223$, $F(15, 41651.727) = 2.820$, $p = < .001$. The Results of Levene's test of equality of error provided evidence that the assumption of homogeneity of variance across groups was met. See Appendix J for the Boxplot, Shapiro-Wilk, Box M, and Levene's test of equality. Pillai's Trace was used for multivariate analysis. According to Tabacknick and Fidell (2018), Pillai's criterion is more robust when there is a violation of the assumption of homogeneity of variance-covariance matrices (p. 224). Results of the MANOVA showed that the main effect for Education was *not significant*, Pillai's Trace = .020, $F(5,135) = 0.549$, $p = .739$, Partial $\eta^2 = .020$, suggesting that the five subscales of Transformational Leadership did not differ by level of Education, Undergraduate (Associate and Bachelors) and Graduate (Masters and Doctoral).

An exploratory one-way independent-samples analysis of variance (ANOVA) was conducted to investigate the impact of education levels (Bachelors, Masters, Doctoral) on the transformational leadership subscales Idealized Influence (IA), Idealized Behaviors (IB), Inspirational Motivation (IM), Intellectual Stimulation (IS), and Individual Consideration. The Results of the ANOVA found *no statistical* differences among the levels of education and the subscale variables of Transformational Leadership. See Table 9 for Results of the ANOVA.

Table 9

Means, Standard Deviations, and One-Way ANOVA Statistics for Transformational Leadership Subscales by Education

	Bachelors			Masters			Doctoral			ANOVA			
Subscale	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*F*	*df*	*η2*	*P*
IA	50	2.71	0.40	82	2.77	0.32	9	2.75	0.13	0.51	2	.007	.601
IB	50	2.82	0.25	82	2.82	0.31	9	2.91	0.06	0.46	2	.007	.628
IM	50	2.89	0.27	82	2.88	0.26	9	3.00	0.00	0.86	2	.012	.424
IS	50	2.86	0.20	82	2.84	0.22	9	2.92	0.18	0.59	2	.008	.555
IC	50	2.93	0.15	82	2.89	0.25	9	3.00	0.00	1.49	2	.021	.229

Note. N = 141

Research Question Number 1b. Does Education Matter?

Are Nurse Managers with more relevant education less transactional in their leadership style, as indicated in the multifactor leadership questionnaire (MLQ-5X) instrument? See Table 10 for the descriptive statistics for the MLQ-5X subscales disaggregated by level of education.

Table 10

Descriptive Statistics for Transactional Leadership by Level of Education

Subscale	Level of Education	*M*	*SD*	*N*
Contingent Reward	Associate & Bachelors	2.71	.39	50
	Masters	2.71	.37	82
	Doctoral	2.78	.34	9
	Total	2.72	.37	141
Management by Exception Active	Associate & Bachelors	1.63	.51	50
	Masters	1.40	.62	82
	Doctoral	1.80	.42	9
	Total	1.51	.58	141
Management by Exception Passive	Associate & Bachelors	.605	.55	50
	Masters	.525	.48	82
	Doctoral	.472	.384	9
	Total	.550	.505	141
Laissez Faire	Associate & Bachelors	.930	.410	50
	Masters	.942	.403	82
	Doctoral	1.08	.450	9
	Total	.946	.407	141

Note. $N = 141$. There was one instance of Associate prepared nurse manager that collapsed into the Bachelors category.

The Transactional Leadership scale in the Multifactor Leadership Questionnaire (Avolio & Bass, 2004) contains four subscales namely, Contingent Reward (CR), Management by Exception Active (MBEA), Management by Exception Active (MBEP), and Laissez Faire (LF) leadership styles. Cronbach's alpha indicated that the internal consistency was low for Transformational Leadership ($\alpha = .52$). A Pearson correlation analysis indicated that there was a strong positive and significant correlation between the transactional Leadership variables. See table 10 for Pearson correlation results among the Transactional Leadership Independent Variables. See Table 11 for Pearson correlations results.

Table 11

Pearson Correlation Results Among Contingent Reward (CR), Management by Exception Active (MBEA), Management by Exception Passive (MBEP), and Laissez-Faire (LF)

Correlations					
		CR	MBEA	MBEP	LF
CR	Pearson Correlation	1	.084	.188*	.124
	Sig. (2-tailed)		.322	.025	.143
	N	142	142	142	142
MBEA	Pearson Correlation	.084	1	.158	.318**
	Sig. (2-tailed)	.322		.061	<.001
	N	142	142	142	142
MBEP	Pearson Correlation	.188*	.158	1	.396**
	Sig. (2-tailed)	.025	.061		<.001
	N	142	142	142	142
LF	Pearson Correlation	.124	.318**	.396**	1
	Sig. (2-tailed)	.143	<.001	<.001	
	N	142	142	142	142

Note: *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

A one-way Multivariate Analysis of Variance (MANOVA) was performed to predict Transactional Leadership Style Contingent Reward (CR), Management by Exception Active (MBEA), Management by Exception Passive, and Laissez Faire (LF) with Education. Due to the small number of Associates degree (n =1) and Doctoral degree (n = 9) prepared nurse managers in the sample, the education category was manipulated. Undergraduate includes Associate and Bachelors (n = 50), and Graduate includes Masters and Doctoral (n = 91). See Table 12 for the descriptive statistics for the dependent variable disaggregated by the independent variable.

Table 12

Descriptive Statistics for Transactional Leadership by Level of Education

Subscale	Level of Education	M	SD	SE	95% Confidence Interval	
					Lower Bound	Upper Bound
CR	Undergraduate	2.71	.39	.054	2.607	2.819
	Graduate	2.72	.37	.040	2.638	2.796
MBEA	Undergraduate	1.63	.52	.082	1.464	1.790
	Graduate	1.44	.62	.061	1.321	1.563
MBEP	Undergraduate	.61	.55	.071	.464	.746
	Graduate	.52	.48	.053	.415	.625
LF	Undergraduate	.93	.41	.058	.816	1.044
	Graduate	.96	.40	.043	.871	1.041

Note. $N = 141$. Undergraduate is Associate and Bachelors prepared. Graduate is Masters and Doctoral Prepared.

For the one–way MANOVA, preliminary assumption testing was conducted. There were no significant outliers by examination of the boxplot. The Shapiro-Wilk test for the levels of the independent variable for the dependent variables indicated that the assumption of normality is violated in three of the variables, $p < .05$. Mahalanobis distance was used to assess multivariate outliers; the critical value of 18.47 was exceeded in two outliers (max. value = 24.273). The multivariate outliers were kept in the model. Box's M test indicated that the assumption of homogeneity of variance-covariance was met, $M = 11.700$, $F(10, 48202.648) = .1.129$, $p = .335$. The Results of Levene's test of equality of error provided evidence that the assumption of homogeneity of variance across groups was met ($p > .05$). See Appendix K for the Boxplot, Shapiro-Wilk, Box M, and Levene's test of equality. Pillai's Trace was used for multivariate analysis. According to Tabacknick and Fidell (2018), Pillai's criterion is more robust when there is a violation of the assumption of homogeneity of variance-covariance matrices (p. 224). Results

of the MANOVA showed that the main effect for Education was *not significant*, Pillai's Trace = .039, $F(4, 136) = 1.390$, $p = .241$, partial $\eta^2 = .039$.

An exploratory one-way independent-samples analysis of variance (ANOVA) was conducted to compare the effect of education levels (Bachelors, Masters, Doctoral) on the transactional leadership subscales Contingent Reward (CR), Management by Exception Active (MBEA), Management by Exception Passive (MBEAP), and Laissez Faire (LF). A one-way ANOVA revealed that there was a statistically significant difference in levels of education between the dependent variable Management by Exception Passive (MBEP) ($p = .029$) and education (Bachelors, Masters, and Doctoral). However, there was no statistical differences for the other dependent variables, Contingent Reward ($p = .879$), Management by Exception Passive ($p = .610$), or Laissez Faire ($p = .578$) by levels of education. Doctoral prepared nurse managers are more likely to use Management by Exception as a leadership style ($M = 1.80$, $SD = 0.43$) than Bachelors prepared nurse managers ($M = 1.63$, $SD = 0.52$). Masters prepared nurse managers are the least likely to use Management by Exception as a leader style ($M = 1.40$, $SD = 0.62$). See Table 13 for the results of the one-way ANOVA disaggregated by educational levels.

Table 13

Means, Standard Deviations, and One-Way ANOVA Statistics for Transactional Leadership by Education: Bachelors, Masters, and Doctoral

Subscale	Bachelors			Masters			Doctoral			ANOVA			
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*F*	*df*	*η2*	*P*
CR	50	2.71	0.39	82	2.71	0.38	9	2.78	0.34	0.129	2	.002	.879
MBEA	50	1.63	0.52	82	1.40	0.62	9	1.80	0.43	3.626	2	.050	*.029
MBEP	50	0.61	0.55	82	0.53	0.49	9	0.47	0.13	0.469	2	.007	.610
LF	50	0.93	0.41	82	0.94	0.40	9	1.08	0.45	0.550	2	.008	.578

Note. *N* = 141. *Statistically significant results.

A Robust test of Equality of Means (Welch) was conducted for the levels of education and the dependent variables (CR, MBEA, MBEP, LF). The results of the effect of education on management by exception *was significant*, $W(2,24.345) = 4.311$, $p = .025$. The levels of education and the dependent variables CR, MBEP, and LF were *not significant*. See Appendix K for the Robust Tests of Equality of Means.

Research Question Number 1c. Does Education Matter?

Are Nurse Managers with more relevant education more successful in their leadership style as indicated in the multifactor leadership questionnaire (MLQ-5X) instrument. See Table 14 for the descriptive statistics for the MLQ-5X subscales by level of education.

Table 14

Descriptive Statistics for Outcomes of Leadership by Level of Education

Subscale	Level of Education	*M*	*SD*	*N*
Extra Effort	Associate & Bachelors	3.12	.61	50
	Masters	3.03	.62	82
	Doctoral	3.44	.37	9
	Total	3.09	.61	141
Satisfaction	Associate & Bachelors	3.50	.47	50
	Masters	3.32	.66	82
	Doctoral	3.56	.46	9
	Total	3.40	.59	141
Effectiveness	Associate & Bachelors	3.31	.51	50
	Masters	3.36	.52	82
	Doctoral	3.56	.35	9
	Total	3.35	.51	141

Note. *N = 141.* There was one instance of Associate prepared nurse manager that collapsed into the Bachelors category.

The Outcomes of Leadership scale in the Multifactor Leadership Questionnaire (Avolio & Bass, 2004) contains three subscales namely, Extra Effort (EE), Satisfaction (SAT), and effectiveness (EFF). Cronbach's alpha indicated that the internal consistency was for high for Outcomes of Leadership ($\alpha = .85$). A Pearson correlation analysis indicated that there was a strong positive and significant correlation between the Outcomes of Leadership variables. See table 15 for Pearson correlation results among the Transformational Leadership Independent Variables.

Table 15

Pearson Correlation Results Among Extra Effort (EE), Satisfaction (SAT), and Effectiveness (EFF)

		Total Extra Effort	Total Satisfaction	Total Effectiveness
EE	Pearson Correlation	1	.599**	.730**
	Sig. (2-tailed)		<.001	<.001
	N	142	142	142
SAT	Pearson Correlation	.599**	1	.662**
	Sig. (2-tailed)	<.001		<.001
	N	142	142	142
EFF	Pearson Correlation	.730**	.662**	1
	Sig. (2-tailed)	<.001	<.001	
	N	142	142	142

**Correlation is significant at the 0.01 level (2-tailed).

A one-way Multivariate Analysis of Variance (MANOVA) was performed to predict Outcomes of Leadership, Total Extra Effort (EE), Total Satisfaction (SAT), and Total Extra Effectiveness (EFF) with education. Due to the small number of Associates degrees (n =1) and Doctoral degrees (n = 9) of prepared nurse managers in the sample, the education category was manipulated. Undergraduate includes Associate and Bachelors (n = 50), and Graduate includes Masters and Doctoral (n = 91). Table 16 includes the descriptive statistics for the dependent variable disaggregated by the independent variable.

Table 16

Descriptive Statistics for Outcomes of Leadership by Level of Education

Subscales	Levels of Education	*M*	*SD*	*N*
Total Extra Effort	Undergraduate	3.12	.61	50
	Graduate	3.07	.61	91
	Total	3.09	.61	141
Total Satisfaction	Undergraduate	3.50	.47	50
	Graduate	3.35	.65	91
	Total	3.40	.59	141
Total Effectiveness	Undergraduate	3.31	.51	50
	Graduate	3.38	.51	91
	Total	3.35	.51	141

Note. $N = 141$. There was one instance of Associate prepared nurse manager that collapsed into the Bachelors category.

For the one-way MANOVA, preliminary assumption testing was conducted. There were three mild univariate outliers as assessed by examination of the boxplot. The Shapiro-Wilk test of univariate normality was performed and indicated that the assumption of normality is violated in two subscales ($p < .001$). However, the MANOVA is reasonably robust to modest violations of normality when the sample size is at least 20 in each cell (Tabacknick and Fidell, 2018, p. 210). Mahalanobis distance was used to assess multivariate outliers; the critical value of 16.27 was exceeded in one case (max. value = 25.26) that accounted for 0.7% of the sample. The univariate and multivariate outliers were left in the model. Box's M test indicated that the assumption of homogeneity of variance-covariance was met, $M = 16.77$, $F(6, 67102.493) = 2.722$, $p = .012$. The Results of Levene's test of equality of error provided evidence that the assumption of homogeneity of variance across groups was met with the exception of the subscale SAT. See Appendix L for the Boxplot, Shapiro-Wilk, Box M, and Levene's test of equality. Pillai's Trace was used for multivariate analysis. According to Tabacknick and Fidell (2018),

Pillai's criterion is more robust when there is a violation of the assumption of homogeneity of variance-covariance matrices (p. 224). Results of the MANOVA showed that the main effect for Education *was significant*, Pillai's Trace = 0.60, $F(3,137) = 2.936$, $p = .036$, Partial $\eta^2 = .060$. See Table 17 for the estimated marginal means.

Table 17

Estimated Marginal Means Bachelors or Graduate Education

				95% Confidence Interval	
Subscale	Level of Education	M	SD	Lower Bound	Upper Bound
Extra Effort	Undergraduate	3.12	.086	2.95	3.29
	Graduate	3.07	.064	2.94	3.20
Satisfaction	Undergraduate	3.50	.083	3.34	3.67
	Graduate	3.35	.062	3.22	3.47
Effectiveness	Undergraduate	3.31	.072	3.17	3.45
	Graduate	3.38	.053	3.28	3.49

Nurse Manager Education and Structural Empowerment

The Conditions of Work Effectiveness Questionnaire II (CEWQ II) descriptive statistics are presented, followed by the research questions. There are two questions pertaining to education and empowerment measured by the CWEQ II instrument—namely, Access to Opportunity, Access to Information, Access to Support, and Access to Resources. Additionally, Total Structural Empowerment, Global Empowerment, Job Activities Scale (formal empowerment), and the Organizational Relationships Scale (informal empowerment) were examined. Instrument descriptive statistics are presented. Following the instrument descriptive statistics are the research questions and analysis. Measures of Central Tendency, Skewness, Kurtosis are presented in Table 18.

Table 18

Conditions of Work Effectiveness Questionnaire II (CWEQ II) Participant Descriptive Statistics

Subscale	*N*	Min	Max	*M*	*SD*	Skewness		Kurtosis	
Total Access to Opportunity	142	1.67	5.00	4.16	.742	-.712	.203	-.077	.404
Total Access to Information	142	1.33	5.00	3.90	.825	-.446	.203	-.152	.404
Total Access to Support	141	1.00	5.00	3.63	.851	-.122	.204	-.131	.406
Total Access to Resources	142	1.00	5.00	2.95	.859	.027	.203	-.247	.404
Total Structural Empowerment	142	8.33	20.00	14.60	2.37	-.256	.203	-.209	.404
Global Empowerment	142	1.00	5.00	3.70	.974	-.476	.203	-.292	.404
Job Activities Scale	142	1.00	5.00	3.42	.811	-.283	.203	.431	.404
Org Relationships Scale	142	1.00	5.00	3.76	.738	-.392	.203	.597	.404

Note. $N = 142$

The Conditions of Work Effectiveness Questionnaire II (CWEQ II) (Laschinger et al., 2001) scale. The CWEQ II contains Eight subscales namely, Total Access to Opportunity (AO), Total Accesses to Information (AI), Total Access to Support (AS), Total Access to Resources (AR), Total Structural Empowerment (SE), Global Empowerment (GE), Job Activities Scale (JAS), and Organizational Relationships scale (ORG). Cronbach's alpha indicated that the internal consistency was moderate for Empowerment ($\alpha = .617$). A Pearson correlation analysis indicated that there was a strong positive and significant correlation between the Empowerment variables. See table 19 for Pearson correlation results among the Transformational Leadership Independent Variables

Table 19

Pearson Correlation Results Among Extra Effort (EE), Satisfaction (SAT), and Effectiveness (EFF)

		AS	AI	AS	AR	SE	GE	JAS	ORG
AO	Pearson Correlation	1	.328**	.341**	.119	.074	-.002	.337**	.121
	Sig. (2-tailed)		<.001	<.001	.157	.383	.981	<.001	.152
	N	142	142	141	142	142	142	142	142
AI	Pearson Correlation	.328**	1	.556**	.388**	.098	-.054	.501**	.284**
	Sig. (2-tailed)	<.001		<.001	<.001	.246	.522	<.001	<.001
	N	142	142	141	142	142	142	142	142
AS	Pearson Correlation	.341**	.556**	1	.318**	.090	.056	.576**	.252**
	Sig. (2-tailed)	<.001	<.001		<.001	.289	.510	<.001	.003
	N	141	141	141	141	141	141	141	141
AR	Pearson Correlation	.119	.388**	.318**	1	.056	.021	.556**	.246**
	Sig. (2-tailed)	.157	<.001	<.001		.510	.804	<.001	.003
	N	142	142	141	142	142	142	142	142
SE	Pearson Correlation	.074	.098	.090	.056	1	.709**	.073	.037
	Sig. (2-tailed)	.383	.246	.289	.510		<.001	.388	.659
	N	142	142	141	142	142	142	142	142
GE	Pearson Correlation	-.002	-.054	.056	.021	.709**	1	.031	.088
	Sig. (2-tailed)	.981	.522	.510	.804	<.001		.710	.296
	N	142	142	141	142	142	142	142	142
JAS	Pearson Correlation	.337**	.501**	.576**	.556**	.073	.031	1	.371**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	.388	.710		<.001
	N	142	142	141	142	142	142	142	142
ORG	Pearson Correlation	.121	.284**	.252**	.246**	.037	.088	.371**	1
	Sig. (2-tailed)	.152	<.001	.003	.003	.659	.296	<.001	
	N	142	142	141	142	142	142	142	142

Note. **Correlation is significant at the 0.01 level (2-tailed).

Research Question Number 2a. Does Education Matter?

Do nurse managers with more relevant education have greater access to Opportunity, Information, Support, and Resources as indicated by the Conditions of Work Effectiveness Questionnaire II (CEWQ-II) instrument? See Table 20 for the descriptive statistics for the CWEQ-II subscales disaggregated by levels of education.

Table 20

Descriptive Statistics for Empowerment by Level of Education: Bachelors, Masters, and Doctoral

Subscales	Levels of Education	*M*	*SD*	*N*
Access to Opportunity	Associate & Bachelors	4.04	.85	50
	Masters	4.24	.65	81
	Doctoral	4.00	.90	9
	Total	4.15	.75	140
Access to Information	Associate & Bachelors	3.83	.89	50
	Masters	3.93	.79	81
	Doctoral	4.30	.66	9
	Total	3.91	.82	140
Access to Support	Associate & Bachelors	3.63	.86	50
	Masters	3.66	.83	81
	Doctoral	3.41	1.1	9
	Total	3.63	.85	140
Access to Resources	Associate & Bachelors	2.90	.95	50
	Masters	3.00	.81	81
	Doctoral	2.85	.90	9
	Total	2.95	.86	140

Note. $N = 141$. There was one instance of Associate prepared nurse manager that collapsed into the Bachelors category.

Multivariate Analysis of Variance (MANOVA) was performed to predict empowerment (Access to Opportunity, Access to Information, Access to Support, and Access to Resources) with levels of education. Due to the small number of Associate degrees ($n = 1$) and Doctoral

degrees (n = 9) for prepared nurse managers in the sample, the education category was manipulated. Undergraduate includes Associate and Bachelors (n = 50), and Graduate includes Masters and Doctoral (n = 91). Table 21 includes the descriptive statistics for the dependent variable disaggregated by the independent variables for levels of education.

Table 21

Descriptive Statistics for Empowerment by Levels of Education

Subscale	Level of Education	*M*	*SD*	*N*
Access to Opportunity	Undergraduate	4.04	.85	50
	Graduate	4.22	.68	90
	Total	4.16	.75	140
Access to Information	Undergraduate	3.83	.89	50
	Graduate	3.97	.78	90
	Total	3.92	.82	140
Access to Support	Undergraduate	3.63	.86	50
	Graduate	3.63	.86	90
	Total	3.63	.85	140
Access to Resources	Undergraduate	2.90	.95	50
	Graduate	2.99	.82	90
	Total	2.95	.86	140

Note. N = 140, one participant did not respond to the question Access to Support, the participant data were eliminated from the analysis.

For the one-way MANOVA, preliminary assumption testing was conducted. There was one mild univariate outlier as assessed by examination of the boxplot. The Shapiro-Wilk test of univariate normality was performed and indicated that the assumption of normality is violated (p < .001) in two of the subscales (Access to Opportunity and Access to Information). However, the MANOVA is reasonably robust to modest violations of normality when the sample size is at least 20 in each cell (Tabacknick & Fidell, 2018, p. 210). Mahalanobis distance was used to assess multivariate outliers; the critical value of 18.47 was exceeded in one case (max.

value = 20.25). The univariate and multivariate outliers were left in the model. Box's M test indicated that the assumption of homogeneity of variance-covariance was met, $M = 12.054$, $F(10, 48429.690) = 1.163$, $p = .311$. The Results of Levene's test of equality of error provided evidence that the assumption of homogeneity of variance across groups was met except in the subscale Total Access to Opportunity. See Appendix M for the Boxplot, Shapiro-Wilk, Box M, and Levene's test of equality. Pillai's Trace was used for multivariate analysis. According to Tabacknick and Fidell (2018), Pillai's criterion is more robust when there is a violation of the assumption of homogeneity of variance-covariance matrices (p. 224). Results of the MANOVA showed that the main effect for Education was *not significant*, Pillai's Trace = .022, $F(4,135) = 0.760$, $p = .553$, Partial $\eta^2 = .022$, suggesting that the four subscales of Empowerment (Access to Opportunity, Information, Support, and Resources) did not differ by level of education, Undergraduate (Associate and Bachelors) and Graduate (Masters and Doctoral).

An exploratory one-way independent-samples analysis of variance (ANOVA) was conducted to investigate the impact of education levels (Bachelors, Masters, Doctoral) on the Empowerment subscales—Access to Opportunity (AO), Access to Information (AI), Access to Support (AS), and Access to Resources (AR). The Results of the ANOVA found *no statistical* differences among the levels of education and the subscale variables of Empowerment. See Table 22 for results of the ANOVA.

Table 22

Means, Standard Deviations, and One-Way ANOVA Statistics for Empowerment by Education

Subscale	Bachelors			Masters			Doctoral			ANOVA		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*F*	*df*	*η2*	*P*
AO	50	4.04	0.85	82	4.25	0.65	9	4.00	0.90	1.441	2	.020	.240
AI	50	3.83	0.89	82	3.91	0.79	9	4.30	0.65	1.253	2	.018	.289
AS	50	3.63	0.89	82	3.66	0.83	9	3.40	1.10	.347	2	.005	.708
AR	50	2.90	.95	82	3.00	0.81	9	2.86	.90	.237	2	.003	.790

Note. $N = 141$.

Research Question Number 2b. Does Education Matter?

Do nurse managers with more relevant education perceive greater levels of formal power, informal power, total structural empowerment, and global empowerment as indicated by the Conditions of Work Effectiveness Questionnaire II (CEWQ – II) instrument subscales Job Activities Scale, Organizational Relationships Scale, Total Structural Empowerment, and Global Empowerment? See Table 23 for the descriptive statistics for the CWEQ-II subscales disaggregated by levels of education.

Table 23

The Conditions of Work Effectiveness II (CWEQ-II) Participant Descriptive Statistics

Subscales	Levels of Education	*M*	*SD*	*N*
Job Activities Scale	Associate & Bachelors	3.41	.822	50
	Masters	3.44	.802	82
	Doctoral	3.33	.942	9
Org Relationships	Associate & Bachelors	3.82	.783	50
Scale	Masters	3.74	.702	82
	Doctoral	3.64	.893	9
	Total	3.76	.740	141

Table 23 (Continued)

Subscales	Levels of Education	*M*	*SD*	*N*
Total Structural Empowerment	Associate & Bachelors	15.04	2.11	50
	Masters	14.33	2.53	82
	Doctoral	15.11	1.80	9
	Total	14.63	2.40	141
Global Empowerment	Associate & Bachelors	3.78	1.01	50
	Masters	3.68	.973	82
	Doctoral	3.50	.790	9
	Total	3.71	.972	141

Note. *N* = 141. There was one instance of Associate prepared nurse manager that collapsed into the Bachelors category.

Multivariate Analysis of Variance (MANOVA) was performed to predict empowerment (Job Activities Scale [JAS], Organizational Relationships Scale [ORS], Total Structural Empowerment, and Global Empowerment) with levels of education. Due to the small number of Associate degrees (*n* =1) and Doctoral degrees (*n* = 9) for prepared nurse managers in the sample, the education category was manipulated. Undergraduate includes Associate and Bachelors (*n* = 50), and Graduate includes Masters and Doctoral (*n* = 91). Table 24 includes the descriptive statistics for the dependent variable disaggregated by the independent variables for levels of education.

Table 24

Descriptive Statistics for Empowerment by Levels of Education: Graduate

Subscale	Level of Education	*M*	*SD*	*N*
Job Activities Scale	Undergraduate	3.40	.82	50
	Graduate	3.43	.81	91
	Total	3.42	.81	141
Org Relationships Scale	Undergraduate	3.82	.78	50
	Graduate	3.73	.72	91
	Total	3.76	.74	141
Total Structural Empowerment	Undergraduate	15.04	2.11	50
	Graduate	14.41	2.47	91
	Total	14.63	2.36	141
Global Empowerment	Undergraduate	3.78	1.01	50
	Graduate	3.66	.95	91
	Total	3.71	.97	141

Note. $N = 141$

For the one-way MANOVA, preliminary assumption testing was conducted. There were six mild univariate outliers as assessed by examination of the boxplot. The Shapiro-Wilk test of univariate normality was performed and indicated that the assumption of normality is violated ($p < .001$) in one of the subscales (GE). However, the MANOVA is reasonably robust to modest violations of normality when the sample size is at least 20 in each cell (Tabacknick & Fidell, 2018, p. 210). Mahalanobis distance was used to assess multivariate outliers; the critical value of 18.47 was not exceeded (max. value = 17.725). Box's M test indicated that the assumption of homogeneity of variance-covariance was met, $M = 8.909$, $F(10, 48202.648) = 0.860$, $p = .571$. The Results of Levene's test of equality of error provided evidence that the assumption of homogeneity of variance across groups was met. See Appendix N for the Boxplot, Shapiro-Wilk, Box M, and Levene's test of equality. Pillai's Trace was used for multivariate analysis. According to Tabacknick and Fidell (2018), Pillai's criterion is more robust when there is a

violation of the assumption of homogeneity of variance-covariance matrices (p. 224). Results of the MANOVA showed that the main effect for Education was *not significant*, Pillai's Trace = .024, $F(4,136) = 0.824$, $p = .512$, Partial $\eta^2 = .024$, suggesting that the four subscales of Empowerment (Job Activities Scale, Organizational Relationships Scale, Total Structural Empowerment, and Global Empowerment) did not differ by level of education, Undergraduate (Associate and Bachelors) and Graduate (Masters and Doctoral).

An exploratory one-way independent-samples analysis of variance (ANOVA) was conducted to investigate the impact of education levels (Bachelors, Masters, Doctoral) on the Empowerment subscales, Job Activities Scale (JAS), Organizational Relationships Scale (ORG), Total Structural Empowerment (TSE), and Global Empowerment (GE). The results of the ANOVA found *no statistical* differences among the levels of education and the subscale variables of Empowerment. See Table 25 for results of the ANOVA.

Table 25

Means, Standard Deviations, and One-Way ANOVA Statistics for Empowerment Subscales

Subscale	Bachelors			Masters			Doctoral			ANOVA		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*F*	*df*	*η2*	*P*
JAS	50	3.40	0.82	82	3.44	0.80	9	3.33	0.94	0.088	2	.001	.916
ORG	50	3.81	0.78	82	3.74	0.70	9	3.63	0.30	.274	2	.004	.761
TSE	50	15.03	0.2.1	82	14.33	2.52	9	15.11	1.79	1.599	2	.023	.206
GE	50	3.78	1.01	82	3.68	.973	9	3.50	.790	.366	2	.005	.649

Note. $N = 141$

Nurse Manager Education and Culture of Safety

The Hospital Survey on Patient Safety Culture 2.0 (HSOPS) descriptive statistics are presented followed by the research question. There is one question pertaining to education Safety

Culture using the HSOPS instrument. Mainly, Communication about Error, Communication Openness, Hospital Management Support for Patient Safety, and Teamwork were examined. Descriptive statistics are presented. Following the descriptive statistics are the research questions and analysis. Measures of Central Tendency, Skewness, Kurtosis are presented in Table 26.

Table 26

Hospital Survey on Patient Safety Participant Descriptive Statistics

Subscale	*N*	Min	Max	*M*	*SD*	Skewness		Kurtosis	
Communication About Error	142	1.33	5.00	4.49	.600	-2.10	.203	6.609	.404
Communication Openness	142	2.50	5.00	4.20	.578	-.553	.203	-.173	.404
Management Support for PS	142	.33	5.00	3.67	1.13	-.932	.203	.136	.404
Total Teamwork	142	1.67	5.00	4.28	.689	-1.40	.203	2.493	.404

Note. $N = 142$

The Hospital Survey on Patient Safety II (HSOPS) (Agency for Healthcare Research and Quality, 2019) contains four subscales namely, Communication About Error (CE), Communication Openness (CO), Management Support for Patient Safety (MS), and Total Teamwork (TT). A Cronbach's alpha indicated that the internal consistency was low for Patient Safety ($\alpha = .57$). A Pearson correlation analysis indicated that there was a strong positive and significant correlation between the patient safety variables. See Table 27 for Pearson correlation results among the Transformational Leadership Independent Variables.

Table 27

Pearson Correlation Results Among Total Communication About Error, Total Communication Openness, Total Management Support for Patient Safety, and Total Teamwork

		CE	CO	MS	TT
Total Communication About Error	Pearson Correlation	1	.225**	.350**	.231**
	Sig. (2-tailed)		.007	<.001	.006
	N	142	142	142	142
Total Communication Openness	Pearson Correlation	.225**	1	.275**	.371**
	Sig. (2-tailed)	.007		<.001	<.001
	N	142	142	142	142
Total Management Support for PS	Pearson Correlation	.350**	.275**	1	.219**
	Sig. (2-tailed)	<.001	<.001		.009
	N	142	142	142	142
Total Teamwork	Pearson Correlation	.231**	.371**	.219**	1
	Sig. (2-tailed)	.006	<.001	.009	
	N	142	142	142	142

**Correlation is significant at the 0.01 level (2-tailed).

Research Question Number 3. Does Education Matter?

Do nurse managers with more relevant education create a culture of safety within their work unit as indicated by the Hospital Survey on Patient Safety? Four subscales were investigated—Communication about Error, Communication Openness, Hospital Management Support for Patient Safety, and Teamwork. See Table 28 for the descriptive statistics for the HSOPS subscales disaggregated by levels of education.

Table 28

Descriptive Statistics for Patient Safety (Total Communication about Error, Total Communication Openness, Total Management Support for Patient Safety, & Total Teamwork) by Levels of Education

Subscale	Level of Education	*M*	*SD*	*N*
Total Communication About Error	Associate & Bachelors	4.52	.55	50
	Masters	4.51	.54	82
	Doctoral	4.30	1.18	9
	Total	4.50	.60	141
Total Communication Openness	Associate & Bachelors	4.25	.60	50
	Masters	4.18	.57	82
	Doctoral	4.19	.48	9
	Total	4.21	.57	141
Total Management Support for PS	Associate & Bachelors	3.72	1.11	50
	Masters	3.60	1.17	82
	Doctoral	4.07	.97	9
	Total	3.67	1.13	141
Total Teamwork	Associate & Bachelors	4.35	.62	50
	Masters	4.27	.69	82
	Doctoral	4.26	.55	9
	Total	4.30	.66	141

Note. $N = 141$

Multivariate Analysis of Variance (MANOVA) was performed to predict a culture of patient safety, Communication about Error, Communication Openness, Management Support for Patient Safety, and Teamwork with levels of education. Due to the small number of Associate degrees (n =1) and Doctoral degrees (n = 9) for prepared nurse managers in the sample, the education category was manipulated. Undergraduate includes Associate and Bachelors (n = 50), and graduate includes Masters and Doctoral (n = 91). Table 29 includes the descriptive statistics for the dependent variable disaggregated by the independent variables for levels of education.

Table 29

Descriptive Statistics for Patient Safety Culture by Education

Subscale	Levels of Education	*M*	*SD*	*N*
Communication About Error	Undergraduate	4.52	.55	50
	Graduate	4.49	.63	91
	Total	4.50	.60	141
Communication Openness	Undergraduate	4.25	.60	50
	Graduate	4.18	.56	91
	Total	4.21	.57	141
Management Support for PS	Undergraduate	3.72	1.11	50
	Graduate	3.65	1.15	91
	Total	3.67	1.13	141
Total Teamwork	Undergraduate	4.35	.62	50
	Graduate	4.27	.68	91
	Total	4.30	.66	141

Note. $N = 141$

For the one-way MANOVA, preliminary assumption testing was conducted. There were multiple mild univariate outliers and two moderate univariate outliers as assessed by examination of the boxplot. The Shapiro-Wilk test of univariate normality was performed and indicated that the assumption of normality is violated ($p < .001$) in three of the subscales (Communication about Error, Management Support for PS, and Teamwork). However, the MANOVA is reasonably robust to modest violations of normality when the sample size is at least 20 in each cell (Tabacknick & Fidell, 2018, p. 210). Mahalanobis distance was used to assess multivariate outliers; the critical value of 18.47 was exceeded in one case (max. value = 31.766). Box's M test indicated that the assumption of homogeneity of variance-covariance was met, $M = 7.700$, $F(10, 48202.648) = 0.743$, $p = .684$. The Results of Levene's test of equality of error provided evidence that the assumption of homogeneity of variance across groups was met. See Appendix O for the Boxplot, Shapiro-Wilk, Box M, and Levene's test of equality. Pillai's Trace

was used for multivariate analysis. According to Tabacknick and Fidell (2018), Pillai's criterion is more robust when there is a violation of the assumption of homogeneity of variance-covariance matrices (p. 224). Results of the MANOVA showed that the main effect for Education was *not significant*, Pillai's Trace = .005, $F(4,136) = 0.179$, $p = .949$, Partial $\eta^2 = .005$, suggesting that the four subscales of Patient Safety Culture, Communication About Error, Communication Openness, Total Management Support for Patient Safety, and Teamwork did not differ by level of education, Undergraduate (Associate and Bachelors) and Graduate (Masters and Doctoral).

Magnet Designated Organizations

A further exploration of nurse manager participants who work in ANCC Magnet designated organizations was conducted. See Table 30 for the highest level of education achieved by the nurse managers disaggregated by Magnet status of their organizations.

Table 30

Magnet Designation and Highest Level of Academic Achievement

		Highest Academic Level									
		Associate		Bachelors		Masters		Doctoral		Total	
		N	%	*N*	%	*N*	%	*N*	%	*N*	%
Magnet											
	Yes	0	0.0%	34	69.4%	54	65.9%	8	88.9%	96	68.1%
	No	1	100%	15	30.6%	28	34.1%	1	11.1%	45	31.9%

Note. $N = 141$.

Additionally, Magnet supports nurse specialty certification. Magnet Nurses are encouraged to become certified in the specialty they work in. Certifications were held by a higher percentage of nurse managers working in Magnet organizations (73%) compared to nurse

managers working in non-Magnet organizations (27%). A chi-squared test of independence revealed that certifications were significantly more frequent in Magnet organizations, $\chi^2 (1, N = 142) = 5.550, p = .018$.

Magnet Designation and Leadership Style

An exploratory one-way independent-samples analysis of variance (ANOVA) was conducted to compare the effect of Magnet Status on nurse manager leadership style. The independent variable, Magnet, had three groups—Magnet, Journey, and Non-Magnet. The dependent variable subscales were tested separately. The subscales for Transformational Leadership are Idealized Influence Attributes (IA), Idealized Behaviors (IB), Inspirational Motivation (IM), Intellectual Stimulation (IS), Individual Stimulation (IS), and Individual Consideration (IC). The subscales for Transactional Leadership are Contingent Reward (CR), Management by Exception Active (MBEA), Management by Exception Passive (MBEP), and Laissez-Faire (LF). The subscales for Outcomes of Leadership are Total Extra Effort (EE), Total Satisfaction (SAT), and Total Effectiveness (EFF).

A one-way ANOVA revealed a statistically *significant difference* in Magnet status between the dependent variable Extra Effort (EE) and magnet status, $F(2,139) = 3.390$, $p = .037$ $\eta 2 = .047$. Magnet nurses perceive Extra Effort at higher levels ($M = 3.17$) than nurse managers that are on the journey to Magnet ($M = 2.85$) or nurse managers that do not work in a Magnet organization or are on the journey to becoming a Magnet designated organization ($M = 2.93$). However, there were no statistical differences for the other dependent variables. See Table 31 for the results of the one-way ANOVA disaggregated by Magnet Status.

Table 31

Means, Standard Deviations, and One-Way ANOVA Statistics for Leadership Style by Magnet Status

Subscale	Magnet			On the Journey			Non-Magnet			ANOVA			
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*F*	*df*	*η2*	*P*
Transformational Leadership Style													
IA	98	2.78	0.30	25	2.66	0.5	19	2.68	0.41	1.529	2	.022	.220
IB	98	2.84	0.28	25	2.78	0.32	19	2.77	0.32	0.749	2	.011	.475
IM	98	2.91	0.25	25	2.85	0.31	19	2.84	0.24	0.937	2	.013	.394
IS	98	2.86	0.21	25	2.85	0.23	19	2.82	0.22	0.331	2	.005	.719
IC	98	2.93	0.17	25	2.84	0.32	19	2.88	0.23	2.152	2	.03	.120
Transactional Leadership Style													
CR	98	2.73	0.39	25	2.68	0.36	19	2.64	0.32	0.53	2	.008	.590
MBEA	98	1.55	0.59	25	1.35	0.56	19	1.48	0.59	1.29	2	.018	.278
MBEP	98	0.57	0.52	25	0.57	0.45	19	0.45	0.5	0.492	2	.007	.612
LF	98	0.99	0.44	25	0.81	0.33	19	0.92	0.3	1.971	2	.028	.143
Outcomes of Leadership													
EE	98	3.17	0.57	25	2.85	0.59	19	2.93	0.75	3.39	2	.047	*.037
SAT	98	3.43	0.56	25	3.4	0.62	19	3.13	0.72	2.11	2	.029	.125
EFF	98	3.39	0.46	25	3.26	0.52	19	3.18	0.71	1.822	2	.026	.165

Note. $N = 142$. *Statistically significant result.

A Robust test of Equality of Means (Welch) test was conducted for the levels of education and the dependent variables. The results of the effect of education on management by exception *was not significant*, $W(2, 35.208) = 3.240$, $p = .051$.

Magnet Designation and Empowerment

An exploratory one-way independent-samples analysis of variance (ANOVA) was conducted to compare the effect of Magnet Status on nurse Empowerment using the Conditions of Workforce Effectiveness Questionnaire II. The independent variable, Magnet, had three groups—Magnet, Journey, and Non- Magnet. The dependent variable subscales were tested

separately. The subscales for Empowerment are Access to Opportunity (AO), Access to Information (AI), Access to Support (AS), Access to Resources (AR), Total Structural Empowerment (SE), Job Activities Scale (JAS), Organizational Relationships Scale (ORS), and Global Empowerment (GE). The results of the ANOVA found *no statistical* differences among the levels of Magnet Status and the subscale variables of Empowerment. See Table 32 for Results of the ANOVA.

Table 32

ANOVA of Empowerment Subscales by Magnet Status

	Magnet			On the Journey			Non-Magnet			ANOVA			
Subscale	*n*	*M*	*SD*	*n*	*M*	*SD*	*N*	*M*	*SD*	*F*	*df*	*η2*	*P*
AO	*98*	*4.18*	*0.73*	*25*	*4.21*	*0.78*	*19*	*4.00*	*0.74*	*0.538*	*2*	*.008*	*.585*
AI	*98*	3.85	0.81	*25*	4.21	0.76	*19*	3.77	0.90	2.249	*2*	.031	.109
AS	*97*	3.65	0.79	*25*	3.77	0.89	*19*	3.33	1.08	1.555	*2*	.022	.215
AR	*98*	2.92	0.80	*25*	3.15	0.71	*19*	2.89	1.28	0.772	*2*	.011	.464
SE	*98*	14.80	2.46	*25*	14.26	2.36	*19*	14.01	1.85	1.194	*2*	.017	.306
JAS	*98*	3.38	0.75	*25*	3.67	0.78	*19*	3.30	1.09	1.479	*2*	.021	.231
ORS	*98*	3.70	0.69	*25*	3.98	0.74	*19*	3.78	0.95	1.430	*2*	.020	.243
GE	*98*	3.76	0.93	*25*	3.74	1.16	*19*	3.34	0.93	1.467	*2*	.021	.234

Magnet Designation and Patient Safety Culture

Multivariate Analysis of Variance (MANOVA) was performed to predict a Culture of Patient Safety, Communication Openness, Management Support for Patient Safety, and Teamwork with Magnet Status. Table 33 includes the descriptive statistics for the dependent variable disaggregated by the independent variables for Magnet Status. The Magnet category was manipulated into two categories. Magnet contains nurse managers that work in organizations that are Magnet or are on the journey to Magnet and Non-Magnet contains nurse managers that work in organizations that are not Magnet and are not currently putting structures in place to obtain Magnet designation.

Table 33

Descriptive Statistics for Culture of Safety by Magnet Status

Subscale	Magnet Status	*M*	*SD*	*N*
Total Communication Openness	Yes & Journey to Magnet	4.23	.55	123
	Non-Magnet	3.95	.71	19
	Total	4.20	.58	142
Total Management Support for PS	Yes & Journey to Magnet	3.72	1.13	123
	Non-Magnet	3.35	1.07	19
	Total	3.67	1.13	142
Total Teamwork	Yes & Journey to Magnet	4.36	.59	123
	Non-Magnet	3.79	1.04	19
	Total	4.28	.69	142

Note. *N* = 142. Magnet includes organizations that are on the journey to becoming Magnet designated.

The Hospital Survey on Patient Safety II (HSOPS) (Agency for Healthcare Research and Quality, 2019) subscales namely, Communication Openness (CO), Management Support for Patient Safety (MS), and Total Teamwork (TT) were examined. A Cronbach's alpha indicated that the internal consistency was low for the Patient Safety variables ($\alpha = .49$). A Pearson correlation analysis indicated that there was a strong positive and significant correlation between the three patient safety variables. See table 34 for Pearson correlation results among the Culture of Safety Independent Variables.

Table 34

Pearson Correlation Results Among Total Communication Openness, Total Management Support for Patient Safety, and Total Teamwork

		Total Communication Openness	Total Management Support for PS	Total Teamwork
Total Communication Openness	Pearson Correlation	1	.275**	.371**
	Sig. (2-tailed)		<.001	<.001
	N	142	142	142
Total Management Support for PS	Pearson Correlation	.275**	1	.219**
	Sig. (2-tailed)	<.001		.009
	N	142	142	142
Total Teamwork	Pearson Correlation	.371**	.219**	1
	Sig. (2-tailed)	<.001	.009	
	N	142	142	142

**. Correlation is significant at the 0.01 level (2-tailed).

For the one-way MANOVA, preliminary assumption testing was conducted. There were multiple mild univariate outliers and one moderate univariate outlier as assessed by examination of the boxplot. The Shapiro-Wilk test of univariate normality was performed and indicated that the assumption of normality is violated ($p < .001$). However, the MANOVA is reasonably robust to modest violations of normality when the sample size is at least 20 in each cell (Tabacknick & Fidell, 2018, p. 210). Mahalanobis distance was used to assess multivariate outliers; the critical value of 17.28 was not exceeded (max. value = 17.27). Box's M test indicated that the assumption of homogeneity of variance-covariance was met, $M = 18.304$, $F(6, 5673.796) = 2.860$, $p = .009$. The Results of Levene's test of equality of error provided evidence that the assumption of homogeneity of variance across groups was not met. Please see Appendix P for

the Boxplot, Shapiro-Wilk, Box M, and Levene's test of equality. Pillai's Trace was used for multivariate analysis. According to Tabacknick and Fidell (2018), Pillai's criterion is more robust when there is a violation of the assumption of homogeneity of variance-covariance matrices (p. 224). Results of the MANOVA showed that the main effect for Magnet *was significant*, Pillai's Trace = .086, $F(4,137) = 4.313$, $p = .006$, Partial $\eta^2 = .086$, suggesting that the three subscales of Patient Safety Culture namely, Communication Openness, Total Management Support for Patient Safety, and Teamwork differed by Magnet Status. See Figures 2, 3, and 4 for the Stem and Leaf Plots for Total Communication Openness, Total Management Support for Patient Safety, and Total Teamwork, respectively.

Figure 2

Stem and Leaf Plot of Total Communication by Magnet Yes & Magnet Journey and Non-Magnet Organization

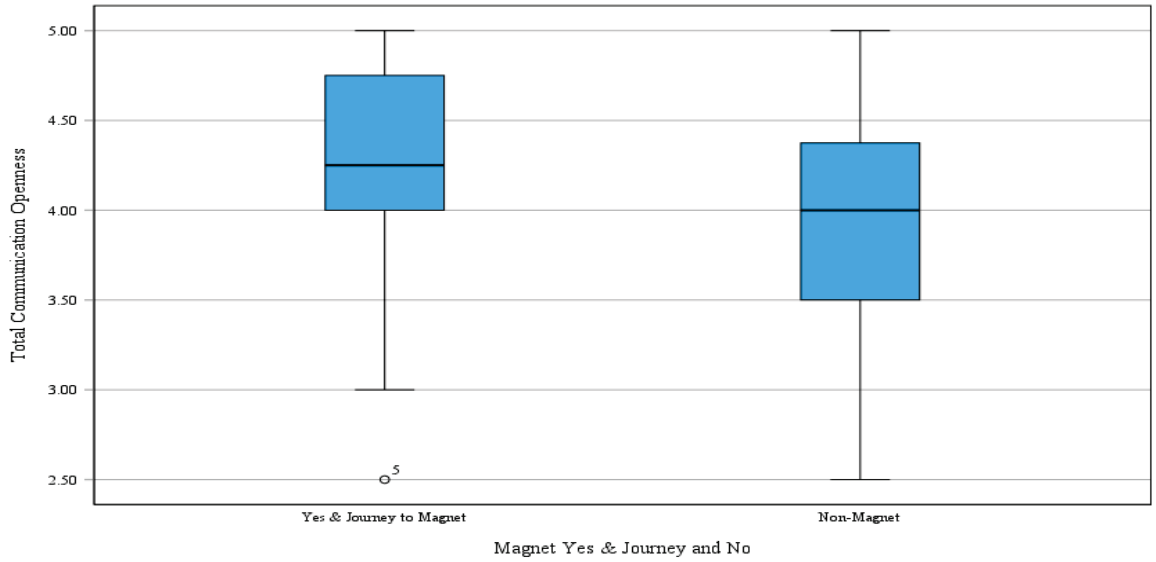


Figure 3

Stem and Leaf Plot of Total Management Support by Magnet Yes & Magnet Journey and Non-Magnet Organization

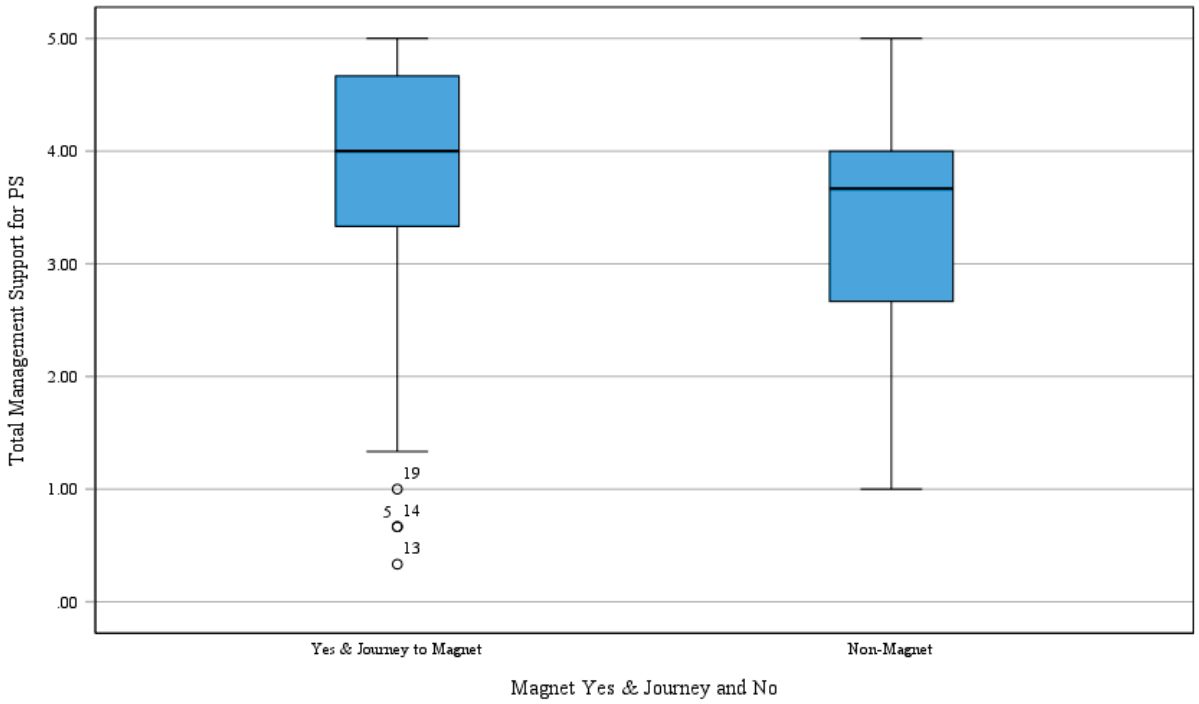
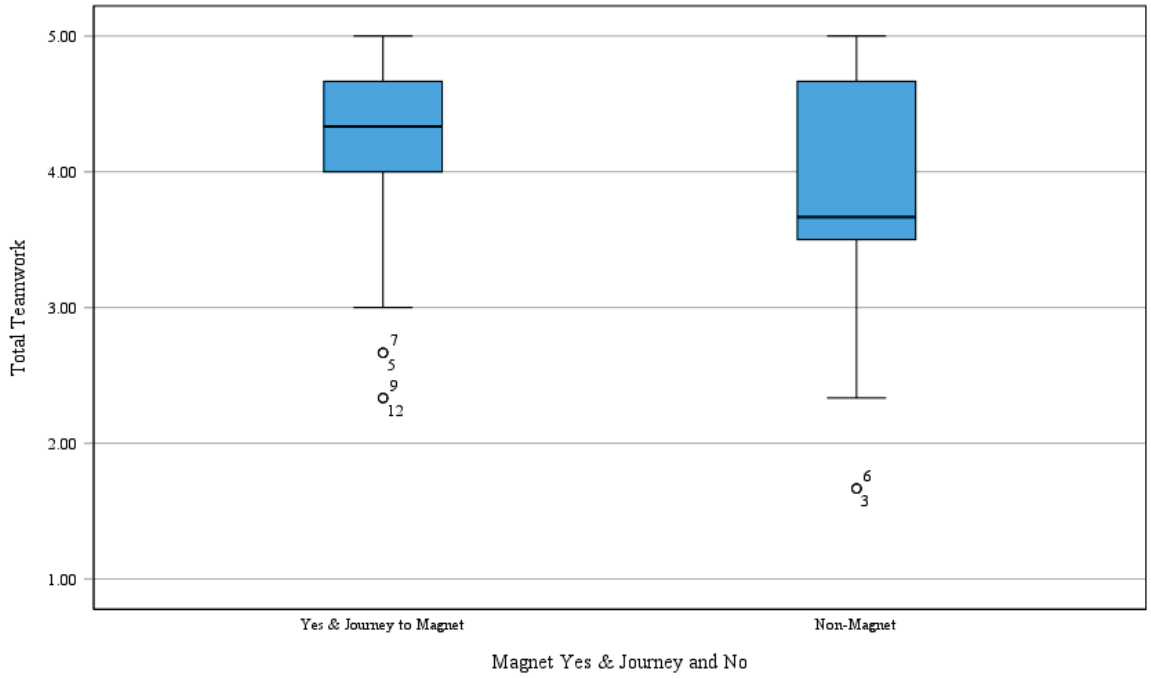


Figure 4

Stem and Leaf Plot of Total Teamwork by Magnet Yes & Magnet Journey and Non-Magnet Organization



Summary

Chapter 4 presented the analysis of data. Statistical data were evaluated to answer the proposed research purposes to understand how education influences leadership style, empowerment, and the culture of patient safety of the nurse managers in the study. The demographic sample was described, and data analysis included measures of central tendencies, frequencies, ANOVAs, and MANOVAs. Chapter 5 will conclude this investigation with a discussion of the results, implications, limitations, and suggestions for future research.

Chapter 5: Discussion of Results

The conclusion of this investigation will discuss the major findings of the study pertaining to the research question: Does education matter? Are nurse managers with more relevant education more transformational and less transactional in their leadership style? Are nurse managers with more relevant education more effective in their leadership style? Does education influence the empowerment of the nurse manager? Do nurse managers with more relevant education create a culture of safety in their work unit? Additionally, the influence of Magnet designation was further investigated with leadership styles, empowerment, and culture of safety. Research implications and limitations will be presented. Chapter 5 will conclude with recommendations for future research.

Discussion

This investigation's overall aim was to examine the influence a nurse manager's level of education and structural empowerment had on the theoretical model of the Patient Safety Chain. The Patient Safety Chain model theorizes that transformational leadership leads to a culture of patient safety, increasing patient safety initiatives that lead to positive patient outcomes (Boamah et al., 2018; McFadden et al., 2009; Murphy, 2005). Rosabeth Kanter's 1977 theory of empowerment was the conceptual framework for this investigation. Without structural empowerment, nurse managers are in an ocean swimming by themselves. Having the structures in place for a nurse manager to be empowered to lead a multidisciplinary team toward safety requires effective top-down leadership to put systems and structures in place for the nurse manager to create a culture of safety.

The results of this investigation may be influenced by the percentage of nurse managers who work in Magnet designated organizations. Data collection for this investigation occurred at the 2022 ANCC Magnet/Pathways conference and on professional social media platforms. The American Nurses Credentialing Center's (ANCC) Magnet Recognition Program® promotes higher academic achievement levels for nurses. In order for an organization to qualify for Magnet designation, all the Nurse Managers in the organization must be at a minimum a baccalaureate prepared nurse (ANCC, n.d.-c). In this study, only one nurse manager identified as an associate degree nurse who works in a non-Magnet designated organization. The high percentage of nurses working in Magnet-designated facilities in the study (n = 98, 69%) is vastly different from the reported percentage in the U.S. and abroad. According to the American Nurses Credentialing Center, 9.96% of the 6,093 hospitals in the U.S. have the ANCC designation of Magnet (ANCC, 2023). There were several notable findings that correlated with the nurse managers' level of education and Magnet designation in this investigation. Each finding will be discussed as it relates to the study variables.

Demographic Findings

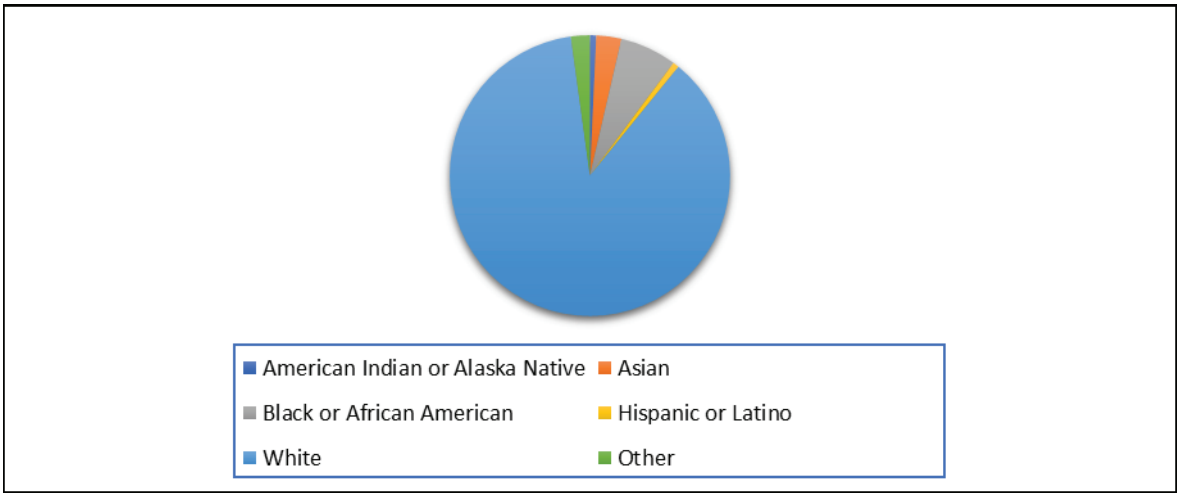
The U.S. Department of Health and Human Services Administration (HRSA, 2019) has been collecting data on the demographics of the nursing workforce in the United States since 1977. The most recent nursing workforce study published by HRSA was conducted in 2018. The National Council of State Boards of Nursing (NCSBN) conducts a Registered Nurse demographic survey every two years. The most recent NCSBN survey was conducted from February 19 to June 30, 2020, at the height of the COVID-19 pandemic (Smiley et al., 2021). The findings from the 2018 HRSA National Sample of Registered Nurses Brief Summary of Results and the NCSBN 2020 National Nursing Workforce Survey will be used to compare and

contrast this investigation's demographic findings. A 2017 study by Warshawsky and Cramer (2019) that specifically surveyed a national sample of nurse managers was additionally used as a comparison in this analysis.

The majority of the participants were white (83.8 %), higher than the statistics in both the HRSA (73.3%) and NCSBC (81%) workforce data surveys (HRSA, 2019; Smiley et al., 2021). However, this is slightly lower than the descriptive statistics from the Warshawsky and Cramer (2019) nurse manager study, which showed an 88% white population for their investigation with nurse managers. The Black or African American nurse managers accounted for 6.9% of the survey's population, consistent with the national data. See Figure 5 for a summary of the race and ethnicity of study participants (Smiley et al., 2021; HRSA, 2019).

Figure 5

Race and Ethnicity of Study Participants, Does Education Matter? Nurse Manager Leadership Styles, Empowerment, and Culture of Safety



Not surprisingly, 92.3 % of the nurse leaders in the survey were female, with males comprising 7.7%. The female-to-male ratio in this investigation is not uncommon in the nursing profession; however, it was lower than the reported averages of males in nursing compared to the

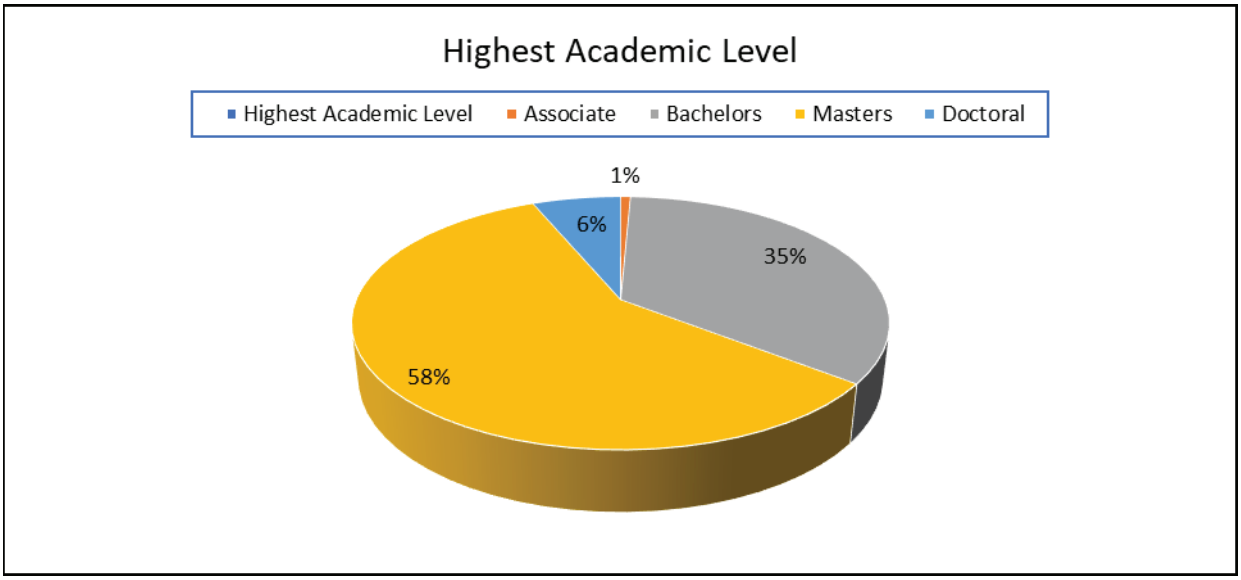
HRSA and NCSBS surveys at 9.4% and 9.6%, respectively (HRSA, 2019; Smiley et al., 2020). The nurse manager participants in this investigation reported no other genders. The gender differences found in this survey reflect the nursing profession as a whole. The two most frequently reported age ranges of the study participants are 36 to 45 (n = 46, 32.4%) and 46 to 55 (n = 46, 34.2%), comprising 64.8% of the investigation's population. The participant age range declines after 55, with the remainder of the study respondents comprising 22% of the population.

The sample of nurse managers that participated in this investigation was highly educated. The most common educational preparation of the nurse managers was impressively at the Masters level (n = 82), representing 58% of the study participants. More than half of the Masters prepared nurse managers concentrated their degree in nursing administration (n = 45, 55.5%). Nurse managers at the Bachelors level represented 35% of the study participants (n = 49), and Doctoral prepared nurse managers (n = 9) represented 6.3% of the study sample. Interestingly the predominant doctoral degree was the Doctor of Nursing Practice (DNP) degree in Leadership (n = 7, 78%). Of the nine doctoral prepared nurse managers, one obtained a research-focused terminal degree (Ph.D.). Figure 6 shows the academic preparation of the study participants.

The study population's educational findings are inconsistent with the NCSBS National Workforce Survey, which found that the Baccalaureate degree made up the most considerable portion of the nursing population (48%) and that the Masters level of education comprised 15% of the population (Smiley et al., 2021). One nurse manager in this study responded to having an Associate degree as the highest level of education (0.7%). In comparison, the NCSBC survey findings for Associate degree as the highest level of education was 28% of the nurses sampled (Smiley et al., 2021). In the NCSBS survey, 1.4% of survey respondents obtained a DNP. Notably, the NCSBS survey reported that 0.7% of respondents obtained a Ph.D. (NSSBC, 2020).

Figure 6

Highest Academic Level of the Nurse Manager Participants, Does Education Matter? Nurse Manager Leadership Styles, Empowerment, and Culture of Safety



The findings in this study were also different from Warshawsky and Cramer's (2019) study, which showed the Bachelors degree (n = 399, 62%) to be the highest level of education for most nurse managers who participated in their investigation.

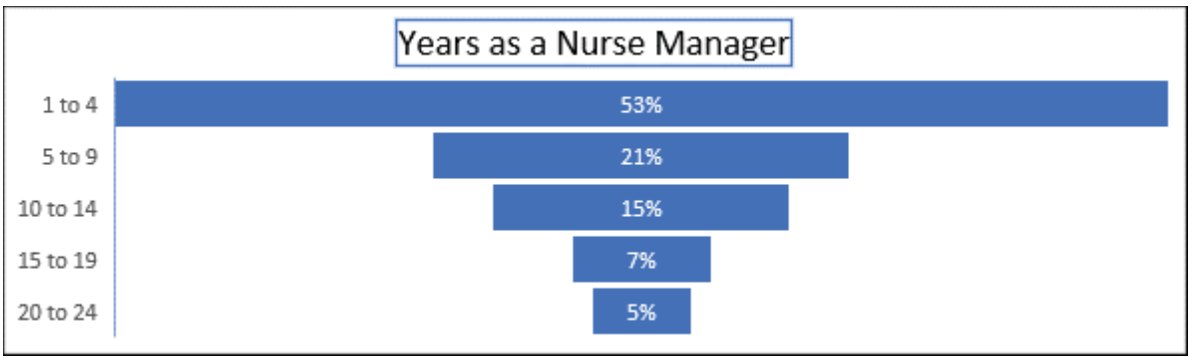
Remarkably, the majority of nurse managers in this study held a specialty certification (n = 110, 78%). The predominant certification was clinical (n = 73, 53%), followed by Other Health Care certifications (n = 31, 25%) and Administration (n = 31, 22%). Thirty-one nurse managers held dual certifications. The total number of certifications held by the nurse managers in the study was 138. Comparatively, 15% of Warshawsky and Cramer's (2019) study participants obtained a specialty certification. The nurse managers that work in Magnet designated organizations had a positive effect on the overall percent of the participants in this investigation, with a nursing specialty certification. This study unsurprisingly found that

certifications were significantly more frequent in nurse managers who worked in Magnet organizations, χ^2 (1, N = 142) = 5.550, p = .018.

The depth of experience of the study population was examined by asking the participants how many years they have held the title of nurse manager. Notably, 74% of the participants had less than ten years of experience. The most common response was one to four years of experience (n = 75, 53%). This finding was consistent with the Warshawsky and Cramer (2019) results. See Figure 7 for a summary of years of experience.

Figure 7

Years as a Nurse Manager for the Participants of Does Education Matter? Nurse Manager Leadership Styles, Empowerment, and Culture of Safety

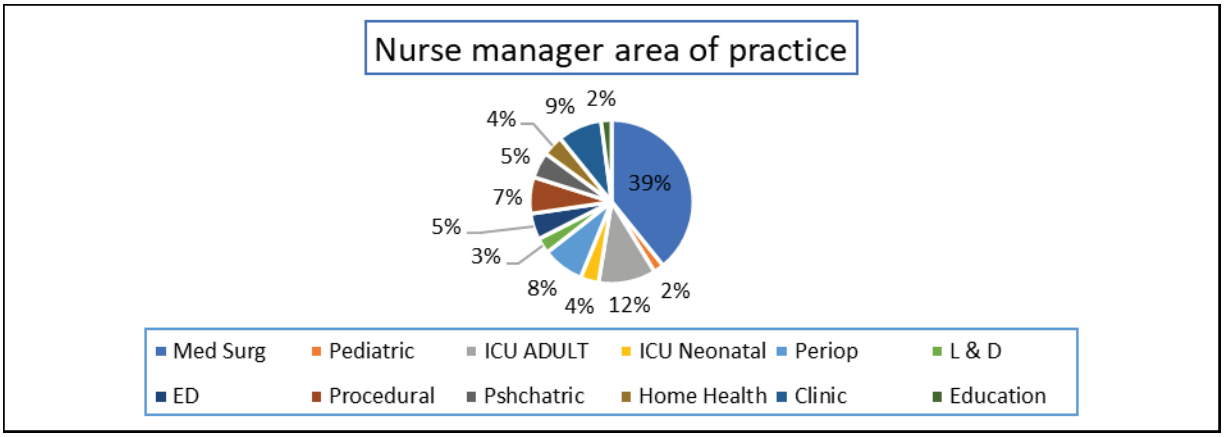


The nurse managers in this investigation came from diverse settings and specialties. The majority of the nurse managers came from suburban settings (n = 66, 46.5%), followed by urban (n = 52, 36.9%) and rural (n = 19, 13.4%) settings. The predominant nurse specialty managed in this investigation was consistent with the profession and predictably Medical Surgical nursing (n = *54,* 38%), followed by Adult ICU (n = 15, 11%). Clinic nurse managers (dialysis, heart failure) were an unexpected finding to this investigator and made up (n = 12, 8.5%) of the respondents. See Figure 8 for the breakdown of the nurse managers' specialty areas of practice. The most frequent response to the number of full-time equivalent (FTE) employees was 70 and

greater (n = 31, 21.8%), showing that nurse managers in this study had large spans of control. This finding was consistent with the Warshawsky and Cramer (2019) study. See Appendix I for the breakdown of FTEs managed by the study participants. Interestingly, 11 nurse managers managed more than one area (7.7%). This may be a post-pandemic symptom finding.

Figure 8

Specialty Areas of Practice Nurse Manager for the Participants of Does Education Matter? Nurse Manager Leadership Styles, Empowerment, and Culture of Safety



Research Findings

Education and Leadership Style

This study addressed three questions related to Education and Leadership style. Does education matter? Are nurse managers with higher levels of education more transformational and less transactional in their chosen leadership style? Does education influence the outcomes or effectiveness of leadership? The Multifactor Leadership Questionnaire-5X was used in this study to explore nurse managers' leadership styles and effectiveness (Avolio & Bass, 2004). This study found that nurse managers who have an undergraduate degree, primarily a Bachelors degree, are not more or less transformational than nurse managers with a graduate degree, Masters or Doctoral. There were no statistical differences by multivariate analysis (MANOVA) between

undergraduate and graduate nurse managers for Transformational Leadership or Transactional Style by the level of education.

Full-range leadership as described by Avolio and Bass (2004) describes transformational leadership on a spectrum and not as an absolute. The instrument descriptive statistics of the participants in this investigation show that the nurse manager subjects were more transformational than transactional. The Transformational subscales of Idealized Influence (M = 2.75, SD = .356), Idealized Behaviors (M = 2.87, SD = .294), Inspirational Motivation (M = 2.89, SD = .258) Intellectual Stimulation (M = 2.85, SD = .212), and Individual Consideration (M = 2.91, SD = .213) leaned toward being more transformational than the Mean scores of Transactional Leadership. The Transactional subscale of Contingent Reward (M = 2.71, SD = .377), was the highest scoring Transactional Leadership style, followed by Management by Exception Active (M = 1.50, SD = .585), and Laissez-Faire (M = .947, SD = .405). Management by Exception Passive (M = .555, SD = .507) was the least reported management style employed by the nurse managers in this study.

However, a MANOVA revealed that in this investigation, nurse managers with an undergraduate degree are significantly more effective in their leadership skills than those with graduate degrees, p = .036. There was a statistically significant difference for one dependent transactional variable found in an Analysis of Variance (ANOVA), Management-by-Exception-Active (MBEA). Doctoral-prepared nurse leaders in this study used MBEA more often than Bachelors or Masters prepared nurse managers, p = .029. Management–by–Exception -Active is a transactional leadership behavior that may lead to achieving expected outcomes; nevertheless, managers who use MBEA strategies may not stimulate the employees' desire to achieve above-expected outcomes (Avolio & Bass, 2004). The MBEA leader style establishes expectations for

the subordinate, focusing on employee deviations from the expectations. The MBEA leader keeps track of transgressions to the expectations, ultimately spending much of their efforts in corrective action rather than coaching.

Conversely, Transformational leaders focus on coaching employees with less emphasis on tracking mistakes (Avolio & Bass, 2004). According to Avolio and Bass, Transformational leadership leads to improved outcomes of leadership (p. 22). Avolio and Bass reported that three variables evaluate Effectiveness in the Multi Leadership Questionnaire 5-X: Extra Effort, Effectiveness, and Satisfaction with Leadership. Extra Effort describes the nurse manager's ability to generate success within the individual follower and team. The leadership skill of Extra Effort is the influence the leader has on the followers. The Effectiveness of leadership is the nurse manager's competence to meet the followers' needs. Effective leaders can skillfully represent their employees' abilities to superiors, instilling confidence in the nurse managers' capability to carry out the organizational goals (Avolio & Bass, 2004).

The ANOVA results for Management–by Exception–Passive leadership by the nurse manager's level of education in this study suggest that the MBEA leadership style for Doctoral prepared nurse managers negatively affected the graduate nurses' leadership outcomes. This finding suggests that Bachelors prepared nurse managers (M = 1.63, SD = 0.52) and Masters prepared nurse managers (M = 1.40, SD = .62) are less transactional than Doctoral prepared nurse managers (M = 1.80, SD = .43), p = .029).

An ANOVA of the MLQ-5X (Avolio & Bass, 2004) dependent variables showed that an organization's Magnet status significantly affected the variable Extra Effort. Extra Effort refers to the individual leader’s ability to create success and influence the team to exceed the leader’s expectations. Extra Effort has a positive effect on the followers’ desire to be successful and seek

challenging work (Avolio & Bass, 2004). Nurse Managers who worked in Magnet-designated organizations were more likely to have increased Extra Effort scores, $p = .037$. The nurse managers' mean score in this study for Extra Effort when working in a Magnet organization ($M = 3.17$, $SD = .57$) is higher than nurse managers who work in organizations that were on the Journey to become Magnet ($M = 2.85$, $SD = .59$) and organizations that are non-Magnet ($M = 2.93$, $SD = .75$).

Education and Nurse Manager Empowerment

This study set out to investigate nurse manager empowerment by asking the question: Do nurse managers with more relevant education create structural empowerment and a sense of empowerment in their subordinates? The Conditions for Work Effectiveness Questionnaire II was used in this study to explore nurse managers' empowerment (Laschinger et al., 2012). This study found that nurse managers who have an undergraduate degree, primarily a Bachelors degree, are not more or less empowered than nurse managers with a graduate degree, Masters or Doctoral. There were no statistical differences, by multivariate analysis (MANOVA), between undergraduate nurse managers and structural empowerment between undergraduate and graduate levels of education. Similarly, an Analysis of Variance (ANOVA) concluded that there were no statistically significant differences between the levels of education, Bachelors, Masters, or Doctoral prepared nurse managers and the structural empowerment variables. Moreover, an ANOVA between Magnet designation; Magnet, on the Journey, and non-Magnet designation, found no statistical significance for nurse managers' levels of empowerment.

The total Structural Empowerment of the Nurse Managers surveyed in this investigation suggests that they are moderately empowered ($M = 14.63$, $SD = 2.4$), compared to a 2016 study by Khan et al. that found high nurse leader empowerment levels using the CWEQ II instrument

(M = 23.23, SD = 3.48) collected at the 2016 ANCC Magnet Conference. This may suggest that nurses' empowerment levels have decreased post-pandemic. According to Laschinger et al., (2001), increased structural empowerment will increase psychological empowerment. Four key factors of psychological empowerment, namely, meaning, confidence, autonomy, and impact, were described by Laschinger et al. (2001). A loss of autonomy or control over the work of the nurse manager in the pandemic may contribute to decreased total structural empowerment levels in the nurse managers who participated in this investigation. However, it is important to note that the level of empowerment for the nurse managers in this study was not low, but in the moderate range. Job strain, intense patient loads, decreased or inadequate staffing, coping with patient death, and nurse-physician conflict can have a detrimental effect on nurses' psychological empowerment (Laschinger et al., 2001). In consideration of the COVID-19 pandemic, moderate empowerment is an achievement of the nurse managers in this analysis.

Education and a Culture of Safety

This investigation aimed to study the perceived culture of safety created by the nurse managers who participated in this research. Do nurse managers with more relevant education create a culture of patient safety within their work unit as indicated by the Hospital Survey on Patient Safety 2.0 (AHRQ, 2019)? This study found that nurse managers who have a graduate degree, primarily a Bachelors degree, are not more or less likely to create a culture of safety than nurse managers with a graduate degree, Masters or Doctoral. There were no statistical differences by multivariate analysis (MANOVA) between the undergraduate and graduate nurse managers for culture of safety. However, a MANOVA was performed to predict a culture of patient safety by Magnet status. The results of the MANOVA showed that the main effect for

Magnet designation was significant, $p = .006$. This finding suggests that Magnet Status has an overall effect on the safety of patients.

Creating a safe environment for patients begins with creating psychological safety for employees (Aiken et al., 2011; Laschinger et al., 2001, 2003, 2004; Laschinger & Leiter, 2006; Murray et al., 2022). For employees to be in a psychological state that enables a positive response to a manager, that manager must be empowered (Laschinger et al., 2009). Psychological safety does not happen overnight and takes years of cultivation (Murray et al., 2022). Industries that are highly consistent for safety, such as aviation, nuclear power plants, and U.S. aircraft carriers, are deemed Highly Reliable Organizations (HROs). At the core of any HRO is the employee psychological safety principle that includes all levels of an organization's employees from senior leadership to the individual worker (Murray et al., 2022). Magnet-designated organizations implement structures that encourage and spread managerial empowerment, creating a psychologically safe environment for nurses to practice and patients to receive care. The journey for an organization to achieve Magnet status is not instantaneous. Organizations may take years to create the structures that enable nurse managers to instill psychological safety in their clinical and non-clinical staff to create a culture that supports patient and staff safety. According to the results of this study, the Magnet outcomes of a safety culture are worth the effort.

Implications

The overall goal of this study was to test the effect of formal education on Leadership Style, Empowerment, and Patient Safety Culture. The findings of this investigation suggest that nurse managers at the Bachelors and Masters levels of education lead their teams of professional and non-professional staff in a more effective leadership style than Doctoral-prepared nurse

managers. Effective leaders influence their followers to perform optimally, working toward fulfilling the organization's goals (Avolio & Bass, 2004; Giltinane, 2013). A highly effective leader inspires their employees to achieve beyond the leader's expectations by stimulating the employees' commitment and desire to achieve (Avolio & Bass, 2004). Organizational and nursing leaders should recognize and mitigate dissonant management styles that do not successfully meet the employees' needs, such as Management-by-Exception and Laissez-Faire.

Before the COVID-19 pandemic, an investigation into structural empowerment conducted at the 2016 ANCC Magnet conference showed high levels of nurse leader empowerment (Khan et al., 2018). The empowerment levels of the participants in this investigation are moderate, and moderate levels of empowerment may be a symptom of the pandemic. In the post-pandemic reality of dissatisfaction, nurse leaders must be influential. Nursing has experienced an erosion of healthy work environments since 2020 (Gilbert, 2023). Influential leaders should inspire frontline nurses to stay in the profession and stabilize their communities. Many clinical bedside nurses are choosing travel nursing to escape the heavy workloads experienced during COVID-19, Respiratory Syncytial Virus (RSV), and the Influenza surges since 2020. As nurses leave their organizations and communities, a negative feedback loop of nurse shortage and increased workloads is left behind. The post-pandemic *Great Resignation* has been superseded by *Great Resentment* (Z. Nolasco, personal communication, November 8, 2022). Furthermore, according to Gilbert (2023), nurse labor costs in the United States have surged along with the pandemic to an unsustainable 24 billion dollars annually.

Empowerment begets empowerment; this investigation reported moderate empowerment, suggesting that the clinical nurses whom the nurse manager participants lead are moderately empowered. Ajanaku et al. (2022) conducted a structured literature review to study the

relationship between structural empowerment and nurses' commitment to their organization. The literature uncovered several themes, most notably that nurses who experience structural empowerment have increased commitment to their organization (Ajanaku et al., 2022). When nurses leave the bedside *en masse*, nurse leaders must evaluate and ensure that structures are in place for the frontline nurses to have access to opportunities, information, support, and resources.

Nurse managers are expected, by their leadership, to create empowered environments for their professional and non-professional clinical staff. Empowered staff ask questions and escalate care issues when appropriate (O'Donovan & McAuliffe, 2020). It is doubtful that nurse managers who are only moderately empowered create a highly empowered nursing team. Empowerment has a trickle-down effect; for nurse managers to be empowered, their direct superiors must be empowered.

During the COVID-19 pandemic surges, senior nurse leaders may have needed to be autocratic in their decision-making. The paucity of knowledge about the COVID-19 pathogen and the quick response required to keep staff safe made rapid decision-making commonplace. Senior nurse leaders should be mindful of their leadership style in post-pandemic recovery to promote shared governance at every level. Additionally, nurses who became managers during the pandemic surge may have yet to experience transformational leadership in practice.

In Kouzes and Posner's (2017) groundbreaking book, *The Leadership Challenge*, the first element of exemplary leadership is to *Model the Way*. Managers develop their style early in their careers by emulating their superiors, and directors must be aware of the critical time needed with new managers to ensure their development. Sending a manager to a training program can effectively introduce managers to new ideas and tools. Nevertheless, suppose the nurse manager's superior withholds information, support, resources, and opportunities from them. In

that case, the manager may model that behavior with their subordinates, creating a disempowered and unengaged work environment leading to dissatisfaction and resentment. Creating healthy work environments for nurses to practice to their full potential is imperative.

The American Nurses Credentialing Center's Pathway to Excellence Program® gives nurse leaders a road map to create an engaging healthy work environment wherever nurses practice (ANCC, n.d.). The six standards of the Pathway to Excellence Program are: (1) shared decision-making, (2) leadership support, (3) safety for both the patient and the nurse—including a culture free from incivility, (4) quality, evidenced-based care, (5) a culture of well-being and recognition, and (6) professional development. The program mitigates what is ailing nurse leaders today —nurse turnover, employee dissatisfaction, lack of engagement, poor productivity, and haphazard teamwork—creating a high-quality workforce, and increasing patient satisfaction (ANCC, n.d.-b; Takawira et al., 2021).

Effective teamwork and communication are hallmarks of a safe patient environment (Gregory et al., 2023). Nurses not only contribute to a Culture of Safety but are bound by the *Code of Ethics for Nurses* to promote, advocate, and protect patients (ANA, 2015). Our code of ethics binds nurse leaders to create a work environment that fosters psychological safety, interdisciplinary teamwork, and communication. This investigation suggests that the ANCC Magnet Recognition Program® leads to a Culture of Safety in the Nurse Managers' work unit. Not every organization where nursing is practiced will pursue Magnet designation; however, ANCC gives the blueprint of an effective, safe nursing service and includes many elements in this investigation, including transformational leadership, structural empowerment, and patient safety.

This investigation explored how two additional variables, levels of education and empowerment, influence the *Patient Safety Chain* model. The *Patient Safety Chain* variable of transformational leadership on the culture of safety, leading to increased awareness toward patient safety initiatives with the outcome of increased patient safety, has been studied. This investigation suggests that empowerment is another link in the *Patient Safety Chain* model that creates a culture where patients receive safe care.

Limitations

This study intended to compare the dependent variable of the instruments used in this investigation to nurse managers' education levels, including diploma, Associate, Bachelors, Masters, and Doctoral-prepared nurse managers. Due to convenience sampling, specifically collecting data at the 2023 ANCC Magnet and Pathways conference in Philadelphia, the sample was biased toward Masters prepared nurse managers from Magnet organizations. However, there were enough participants to compare undergraduate- to graduate-prepared nurse managers, which was central to the thesis of this investigation. The opportunity to study nurse managers from Magnet versus non-Magnet organizations emerged. Participants were additionally recruited on professional social media platforms, including LinkedIn, and a snowball sample effect occurred in sharing the study; it is unknown if the social media participants did not respond at the same rates as the participants at the Magnet and Pathways conference. However, the investigator having the ability to explain the study to potential participants in person at the conference versus a potential participant reaching out to the investigator for further information may have been a limitation. A larger sample size would have increased the generalizability of this investigation. Self-reported data can be subject to social desirability bias; however, the instruments used in this investigation have been extensively used in healthcare research and are

reliable and valid. Despite these limitations, rich data were collected that can be generalizable to the nurse manager population's education levels.

Suggestions for Future Research

This investigation's results suggest the importance of assessing the effects of leadership and empowerment in nursing due to the critical outcomes of leadership and empowerment on patient safety. This inquiry opened up many questions related to the empowerment of nurse managers and their ability to empower staff. The scope of this investigation was the nurse manager's empowerment levels; however, the empowerment of the nurse manager's superiors influences the empowerment levels of the nurse manager. Furthermore, the nurse manager's empowerment level has a trickledown effect on staff nurse empowerment and a culture of safety.

The health of the work environment of nursing staff is a critical area for patient safety. The post-pandemic erosion of the work environment due to staffing levels, possible decrease in psychological safety, potential increase in transient travel nurses, and a likely decrease in communication and teamwork is an area well suited for additional research as the profession of nursing recoils from the effects of the COVID-19 pandemic.

Further research to explore how senior leaders influence the empowerment levels of nurse managers and staff would provide nursing leadership with information to improve patient safety. Moreover, this study suggests that empowerment is an additional variable influencing the *Patient Safety Chain*. Further investigation of empowerment and the *Patient Safety Chain* in a large random sample of nurse leaders is warranted. Additionally, other researchers may want to explore additional nursing links that influence the *Patient Safety Chain model*.

Summary

This study sought to investigate the perceived leadership styles, levels of structural empowerment, and safety culture of nurse managers in acute care hospitals, clinics, and home health. The findings in this study suggest that nurse managers at the Bachelors and Masters levels of education lead their teams of professional and non-professional staff in a more effective leadership style than Doctoral-prepared nurse managers. The empowerment of the participants in this investigation was at moderate levels of empowerment and may be declining due to the post-pandemic health of nurse working environments. This study suggests that the addition of empowerment in the *Patient Safety Chain* model may significantly influence patient safety outcomes. Additionally, this investigation suggests that the Magnet Recognition Program® significantly influences leadership effectiveness and patient safety.

Chapter 5 presented the demographic characteristics of the study participants, the significant findings related to the research questions, the implications of the study, as well as the limitations of the investigation. Additionally, future recommendations for research were discussed.

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Appendix A: Example of the Multifactor Leadership Questionnaire and Permission

Multifactor Leadership Questionnaire Permission and Sample Questions

www.mindgarden.com

To Whom It May Concern,

The above-named person has made a license purchase from Mind Garden, Inc. and has permission to administer the following copyrighted instrument up to that quantity purchased:

Multifactor Leadership Questionnaire

The three sample items only from this instrument as specified below may be included in your thesis or dissertation. Any other use must receive prior written permission from Mind Garden. The entire instrument may not be included or reproduced at any time in any other published material. Please understand that disclosing more than we have authorized will compromise the integrity and value of the test.

Citation of the instrument must include the applicable copyright statement listed below.
Sample Items:

As a leader ....
I talk optimistically about the future.
I spend time teaching and coaching.
I avoid making decisions.

The person I am rating....
Talks optimistically about the future.
Spends time teaching and coaching.
Avoids making decisions

Sincerely,

Robert Most
Mind Garden, Inc.
www.mindgarden.com

Appendix B: Example of the Conditions of Work Effectiveness Questionnaire and Permission

Sample of the Conditions of Work Effectiveness Questionnaire

CONDITIONS FOR WORK EFFECTIVENESS QUESTIONNAIRE-II

How much of each kind of opportunity do you have in your present job?

1 = None	2	3 = Some	4	5 = A Lot
1. Challenging work				1 2 3 4 5
2. The chance to gain new skills and knowledge on the job				1 2 3 4 5
3. Tasks that use all of your own skills and knowledge				1 2 3 4 5

How much access to information do you have in your present job?

1 = No Knowledge	2	3 = Some Knowledge	4	5 = Know A Lot
1. The current state of the hospital				1 2 3 4 5
2. The values of top management				1 2 3 4 5
3. The goals of top management				1 2 3 4 5

How much access to support do you have in your present job?

1 = None	2	3 = Some	4	5 = A Lot
1. Specific information about things you do well				1 2 3 4 5
2. Specific comments about things you could improve				1 2 3 4 5
3. Helpful hints or problem solving advice				1 2 3 4 5

How much access to resources do you have in your present job?

1 = None	2	3 = Some	4	5 = A Lot
1. Time available to do necessary paperwork				1 2 3 4 5
2. Time available to accomplish job requirements				1 2 3 4 5
3. Acquiring temporary help when needed				1 2 3 4 5

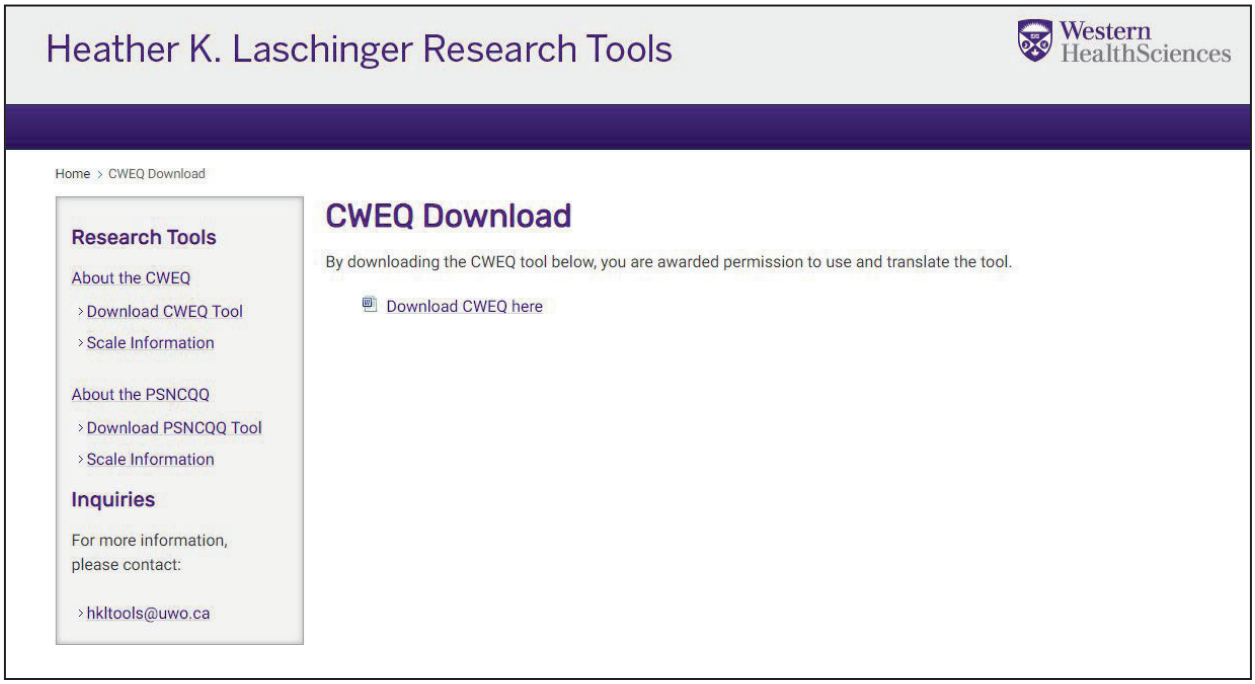
In my work setting/job: (JAS)

1 = None	2	3 = Some	4	5 = A Lot
1. the rewards for innovation on the job are				1 2 3 4 5
2. the amount of flexibility in my job is				1 2 3 4 5
3. the amount of visibility of my work-related activities within the institution is				1 2 3 4 5

How much opportunity do you have for these activities in your present job: (ORS)

1 = None	2	3 = Some	4	5 = A Lot
1. Collaborating on patient care with physicians				1 2 3 4 5
2. Being sought out by peers for help with problems				1 2 3 4 5
3. Being sought out by managers for help with problems				1 2 3 4 5
4. Seeking out ideas from professionals other than physicians, e.g., physiotherapists, occupational therapists, dieticians				1 2 3 4 5

Permission to use the Conditions of Work Effectiveness Questionnaire



Note. This Conditions of Work Effectiveness questionnaire is a freely available instrument through the Western University of Canada.

Appendix C: Example Hospital Survey on Patient Safety

Questionnaire and Permission

Sample questions for the Hospital Survey on Patient Safety & Permission

SECTION C: Communication

How often do the following things happen in your unit/work area?

Think about your unit/work area:	Never	Rarely	Some-times	Most of the Time	Always	Does Not Apply or Don't Know
1. We are informed about errors that happen in this unit	☐1	☐2	☐3	☐4	☐5	☐9
2. When errors happen in this unit, we discuss ways to prevent them from happening again	☐1	☐2	☐3	☐4	☐5	☐9
3. In this unit, we are informed about changes that are made based on event reports	☐1	☐2	☐3	☐4	☐5	☐9
4. In this unit, staff speak up if they see something that may negatively affect patient care	☐1	☐2	☐3	☐4	☐5	☐9
5. When staff in this unit see someone with more authority doing something unsafe for patients, they speak up	☐1	☐2	☐3	☐4	☐5	☐9
6. When staff in this unit speak up, those with more authority are open to their patient safety concerns	☐1	☐2	☐3	☐4	☐5	☐9
7. In this unit, staff are afraid to ask questions when something does not seem right	☐1	☐2	☐3	☐4	☐5	☐9

Note: Agency for Healthcare Research and Quality. (2016). Hospital survey on patient safety culture users guide. https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/ quality-patient-safety/patientsafetyculture/hospital/userguide/hospcult.pdf

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Appendix D: Example of the Demographic Questionnaire

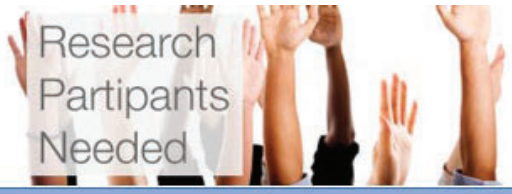
Nurse Manager Demographic Survey

Question	***Selections***
Name	Fill in
What is your Age?	< 25 years of age
	25 – 35 years of age
	36 – 45 years of age
	46 – 55 years of age
	56 – 65 years of age
	>65 years of age
	Prefer not to answer
What gender do you identify as?	*Female*
	Male
	Transgender Female
	Transgender Male
	Non-Binary
	Gender Non-Conforming
	Other
	Prefer not to answer
What Race or Ethnicity do you identify as?	*American Indian or Alaska native*
	Asian
	Black or African American
	Hispanic or Latino
	Native Hawaiian or Pacific Islander
	White
	Other
	Prefer not to Answer
What is your highest academic level	*Diploma*
	Associates
	Bachelors
	Masters
	Masters in Nursing Administration
	Masters in Nursing Education
	Masters in Nurse Practitioner
	Masters of Business Administration
	Other
	Doctoral
	Doctor of Nursing Practice (Clinical)
	Doctor of Nursing Practice (Leadership)
	Doctor of Education - Nursing
	Doctor of Philosophy – Nursing
	Doctor of Nursing Science
	Other

Question	***Selections***
Do you hold a Specialty Certification?	*Yes*
	Nursing Executive

	Clinical (i.e., CCRN, CMSRN, etc.)
	Other Healthcare (i.e., CPHQ)
	No
How many years have you held the title of Nurse Manager?	*<1 year*
	1 to 4 years
	5 – 9 years
	10 – 14 years
	15 – 19 years
	20 – 24 years
	25 – 29 years
	30 – 34 years
	35 years or greater
	Prefer not to answer
What type of Unit(s) do you manage?	*Medical Surgical – Adult*
	Medical Surgical – Pediatric
	Intensive Care – Adult
	Intensive Care – Pediatric
	Intensive Care – Neonatal
	Perioperative
	Labor & Delivery
	Maternal Child Health
	Emergency Department
	Procedural
	Psychiatric
	Home Health
	Other (i.e., Clinic)
How many Full Time Equivalent (FTE) do you manage?	*1 – 9*
	10 – 19
	20 – 29
	30 – 39
	40 – 49
	50 – 59
	60 – 69
	70+
	Not sure
What Setting do you work in?	*Suburban*
	Urban
	Rural
	Other
Does your organization hold the designation of Magnet?	*Yes*
	No
Is your organization on the Magnet Journey	*Yes*
	No
	Not sure

Appendix E: Participant Flyer



CALLING ALL NURSE MANAGERS!

Participants Needed for Research Study on Nurse Manager Empowerment

Would you like to share your experience as a Nurse Manager, your level of empowerment, and the culture of safety of your work unit? This study investigates if a nurse manager's academic education, including levels and areas of study, influences transformational leadership leading to empowerment of the nurse manager that ultimately leads to a culture of safety for patients.

Who is eligible?

- Nurse Managers or equivalent title who are fully employed by the institution where they work
- Actively manage clinical nurses in an acute care hospital, clinic, or homecare setting
- Can read and write in the English language.

Participation Involves

- Completion of a one-time online survey that takes approximately 10 minutes to complete
- If you attend the ANCC National conference and visit the designated booth, you will be offered customary swag items such as pens and lip-gloss. Additionally, you will be eligible to be selected to be presented with an iPad or equivalent gift for your participation at the end of the study.

Scan the QR code to participate

FOR MORE INFORMATION

Please contact Jeanmarie Moorehead, at 631-332-8257 or email JM2434@tc.columbia.edu.
Jeanmarie is a student at Teachers College, Columbia University conducting this research for her doctoral dissertation (IRB-21-426).

Appendix F: Informed Consent for the Study

TEACHERS COLLEGE
COLUMBIA UNIVERSITY
525 West 120th St. New York, NY 10027
212-678-3000 | www.tc.columbia.edu

INFORMED CONSENT

Protocol Title: Does Education Matter? Nurse Manager Leadership Style and Clinical Nurse Empowerment and Perceptions of Culture of Safety.
Principal Researcher: Jeanmarie Moorehead, Teachers College Student, 516-252-7188, jm2434@tc.columbia.edu
IRB Protocol #– 21-426

INTRODUCTION: You are invited to participate in this research study called "Does Education Matter? Nurse Manager Leadership Style and Clinical Nurse Empowerment and Perceptions of Culture of Safety." This Study investigates if a nurse Manager's academic education, including levels and areas of study, influences transformational leadership leading to empowerment of the nurse manager that ultimately leads to a culture of safety for patients. You may qualify to participate in this research study because you are a Nurse Manager or equivalent, can read and write in the English language, and are fully employed in an acute care hospital, clinic, or homecare setting. Approximately one hundred and fifty people will participate in this study and it will take 10 minutes of your time to complete.

WHY IS THIS STUDY BEING DONE? This study is being conducted to investigate if nurse managers' academic education influences the patient safety chain of transformational leadership, empowerment, and culture of safety in an acute hospital, clinic, or homecare setting.

WHAT WILL I BE ASKED TO DO IF I AGREE TO TAKE PART IN THIS STUDY? If you decide to participate, the primary researcher will invite you to complete an online survey about leadership style, empowerment, and culture of safety. Finally, you will be asked to complete a demographic survey. The survey can be accessed at a time that is convenient to you.

WHAT POSSIBLE RISKS OR DISCOMFORTS CAN I EXPECT FROM TAKING PART IN THIS STUDY? This is a minimal risk study, which means the harms or discomforts that you may experience are not greater than you would ordinarily encounter in daily life while taking a routine survey. You can stop participating in the study at any time without penalty. You might feel concerned that things you say might get back to your supervisor. Your information will be kept confidential. The primary researcher is taking precautions to keep your information confidential and prevent anyone from discovering or guessing your

identity by using a de-identified code instead of your name and keeping all information on a password protected computer.

WHAT POSSIBLE BENEFITS CAN I EXPECT FROM TAKING PART IN THIS STUDY? There is no direct benefit to you for participating in this study. Participation may benefit the field of nursing education to better understand the best way to train nurse leaders.

WILL I BE PAID FOR BEING IN THIS STUDY? If you attend the ANCC National conference and visit the designated booth, you will be offered customary swag items such as pens and lip gloss. Additionally, you will be eligible to be selected to be presented with an iPad or equivalent gift for your participation at the end of the study.

WHEN IS THE STUDY OVER? CAN I LEAVE THE STUDY BEFORE IT ENDS? The study is over when you have completed the survey. However, you can leave the study at any time even if you have not finished.

PROTECTION OF YOUR CONFIDENTIALITY The primary researcher will keep all written materials locked in a desk drawer in a locked office. Any electronic or digital information will be stored on a computer that is password protected. A master list identifying you as a participant will be kept separate from your responses to survey questions. All information identifying you as a participant will be deleted at the completion of the Primary Investigators dissertation defense.
For quality assurance, the study team, the study sponsor, and/or members of the Teachers College Institutional Review Board (IRB) may review the data collected from you as part of this study. Otherwise, all information obtained from your participation in this study will be held strictly confidential and will be disclosed only with your permission or as required by U.S. or State law.

HOW WILL THE RESULTS BE USED? The results of this study will be published in journals and presented at academic conferences. Your identity will be removed from any data you provide before publication or use for educational purposes. Your name or any identifying information about you will not be published. This study is being conducted as part of the dissertation of the primary researcher.

WHO CAN ANSWER MY QUESTIONS ABOUT THIS STUDY? If you have any questions about taking part in this research study, you should contact the primary researcher, Jeanmarie Moorehead, at 516-252-7188 or at jm2434@tc.columbia.edu.

If you have questions or concerns about your rights as a research subject, you should contact the Institutional Review Board (IRB) (the human research ethics committee) at 212-678-4105 or email IRB@tc.edu or you can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY 10027, Box 151. The IRB is the committee that oversees human research protection for Teachers College, Columbia University.

PARTICIPANT'S RIGHTS

- I have read the Informed Consent Form and have been offered the opportunity to discuss the form with the researcher.
- I have had ample opportunity to ask questions about the purposes, procedures, risks, and benefits regarding this research study.
- I understand that my participation is voluntary. I may refuse to participate or withdraw participation at any time without penalty.
- The researcher may withdraw me from the research if I do not meet the study criteria at the researcher's professional discretion.
- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue my participation, the researcher will provide this information to me.
- Any information derived from the research study that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.
- Your data will not be used in further research studies.
- I should receive a copy of the Informed Consent Form document.

On-Line survey Consent

By checking the "I agree" box and typing your name, you agree to participate in this study. You also confirm you are a Professional Registered Nurse who holds the title of nurse manager or equivalent and are fully employed in an acute care hospital, clinic, or homecare setting .Additionally, you confirm that you can read and write in the English language. To agree: Check the "I agree" box and click NEXT to participate in the study. If you do not wish to participate in this study, simply close out of the browser window.

Appendix G: Institutional Review Board Letters

Expedited Review Approval

Attachments:
• Expedited Review Approved by Chair - IRB ID: 21-426.pdf

TEACHERS COLLEGE
COLUMBIA UNIVERSITY

Teachers College IRB *Expedited Approval Notification*

To: Jeanmarie Moorehead
From: Myra Luna Lucero Research Compliance Director
Subject: IRB Approval: 21-426 Protocol
Date: 10/13/2021

Please be informed that as of the date of this letter, the Institutional Review Board for the Protection of Human Subjects at Teachers College, Columbia University has given full approval to your study, entitled "*Does Education Matter? Nurse Manager Leadership Style and Clinical Nurse Empowerment and Perceptions of Culture of Safety*," under **Expedited Review** on 10/13/2021: Category (7) Research on individual or group characteristics or behavior

The approval is effective until **10/12/2022**.

The IRB Committee must be contacted if there are any changes to the protocol during this period. **Please note:** If you are planning to continue your study, a Continuing Review report must be submitted to either close the protocol or request permission to continue for another year. Please submit your report by **09/28/2022** so that the IRB has time to review and approve your report if you wish to continue your study. The IRB number assigned to your protocol is **21-426**. Feel free to contact the IRB Office (212-678-4105 or irb@tc.edu) if you have any questions.

Please note that your Consent form bears an official IRB authorization stamp and is attached to this email. Copies of this form with the IRB stamp must be used for your research work. Further, all research recruitment materials must include the study's IRB-approved protocol number.

As the PI of record for this protocol, you are required to:

- Use current, up-to-date IRB approved documents
- Ensure all study staff and their CITI certifications are on record with the IRB
- Notify the IRB of any changes or modifications to your study procedures
- Alert the IRB of any adverse events

You are also required to respond if the IRB communicates with you directly about any aspect of your protocol. Failure to adhere to your responsibilities as a study PI can result in action by the IRB up to and including suspension of your approval and cessation of your research.

You can retrieve a PDF copy of this approval letter from Mentor IRB.

When your study ends, please visit the IRB Mentor site. Go to the Continuing Review tab and select "terminate" from the drop-down menu.

Best wishes for your research work.

Sincerely,
Dr. Myra Luna Lucero
Research Compliance Director
IRB@tc.edu

Continued Review Approval

Attachments:
- Informed Consent Form_Final_21-426.pdf
- Cont. Review Approved Notification - IRB ID: 21-426.pdf

TEACHERS COLLEGE
COLUMBIA UNIVERSITY

Teachers College IRB *Continuing Review Approval Notification*

To: Jeanmarie Moorehead
From: Curt Naser, TC IRB Administrator
Subject: IRB Approval: 21-426 Protocol
Date: 09/28/2022

Please be informed that as of the date of this letter, the Institutional Review Board for the Protection of Human Subjects at Teachers College, Columbia University has approved your *continuing* study, entitled "*Does Education Matter? Nurse Manager Leadership Style and Clinical Nurse Empowerment and Perceptions of Culture of Safety*" on 09/28/2022.

The approval is effective until **10/12/2023**.

The IRB Committee must be contacted if there are any changes to the protocol during this period. **Please note:** If you are planning to continue your study, a Continuing Review report must be submitted to either close the protocol or request permission to continue for another year. Please submit your report by **09/28/2023** so that the IRB has time to review and approve your report if you wish to continue your study. The IRB number assigned to your protocol is **21-426**. Feel free to contact the IRB Office (212-678-4105 or IRB@tc.edu) if you have any questions.

Please note that your Consent form bears an official IRB authorization stamp and is attached to this email. Copies of this form with the IRB stamp must be used for your research work. Further, all research recruitment materials must include the study's IRB-approved protocol number. You may retrieve a PDF copy of this approval notification from the Mentor site.

As the PI of record for this protocol, you are required to:

- Use current, up-to-date IRB approved documents
- Ensure all study staff and their CITI certifications are on record with the IRB
- Notify the IRB of any changes or modifications to your study procedures
- Alert the IRB of any adverse events

You are also required to respond if the IRB communicates with you directly about any aspect of your protocol. Failure to adhere to your responsibilities as a study PI can result in action by the IRB up to and including suspension of your approval and cessation of your research.

Best wishes for your research work.

Appendix H: The Type of Unit by Specialty that is Managed by the Nurse Manager Participants

Specialty Units Managed by The Nurse Manager Participants

	N	%
Medical Surgical Adult	54	38.0%
Medical Surgical Pediatric	3	2.1%
ICU Adult	15	10.6%
ICU Neonatal	5	3.5%
Perioperative	11	7.7%
Labor & Delivery	4	2.8%
Emergency Department	7	4.9%
Procedural	10	7.0%
Psychiatric	7	4.9%
Home Health	6	4.2%
Clinic	12	8.5%
Prof. Development & Education	3	2.1%
Other	4	2.8%

Note: N = 141

Appendix I: The Number of FTEs Managed by the Nurse Manager Participants

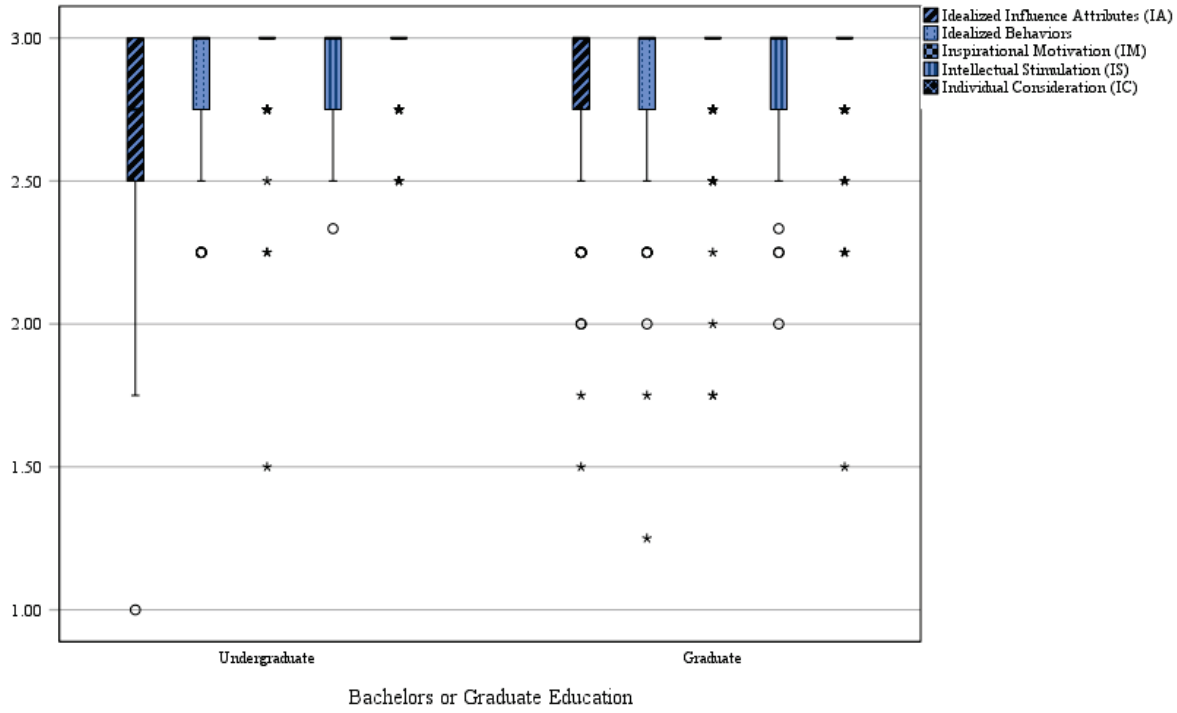
FTE Category Managed by the Nurse Manager Participants

	N	%
1 to 9	16	11.3%
10 to 19	22	15.5%
20 to 29	14	9.9%
30 to 39	18	12.7%
40 to 49	17	12.0%
50 to 59	16	11.3%
60 to 69	6	4.2%
70 and greater	31	21.8%

Note: N = 140

Appendix J: Research Question 1a: MANOVA Assumption Testing, Boxplot, Shapiro-Wilk, Box M, and Levene's Test of Equality

Boxplot showing outliers for Transformational Leadership Dependent Variables by Level of Education, Undergraduate & Graduate.



Shapiro – Wilk Test of Normality for Transformational Leadership by Levels of Education, Undergraduate & Graduate

Subscale	Bachelors or Graduate Education	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Idealized Influence Attributes (IA)	Undergraduate	.256	50	<.001	.723	50	<.001
	Graduate	.297	91	<.001	.731	91	<.001
Idealized Behaviors	Undergraduate	.342	50	<.001	.716	50	<.001
	Graduate	.327	91	<.001	.605	91	<.001
Inspirational Motivation (IM)	Undergraduate	.433	50	<.001	.454	50	<.001
	Graduate	.444	91	<.001	.489	91	<.001
Intellectual Stimulation (IS)	Undergraduate	.379	50	<.001	.706	50	<.001
	Graduate	.349	91	<.001	.714	91	<.001
Individual Consideration (IC)	Undergraduate	.478	50	<.001	.510	50	<.001
	Graduate	.443	91	<.001	.487	91	<.001

Box's Test of Equality of Covariance Matrices[a] for TL by Education Level Undergraduate & Graduate

Box's M	44.223
F	2.820
df1	15
df2	41651.727
S.	<.001

Note. Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

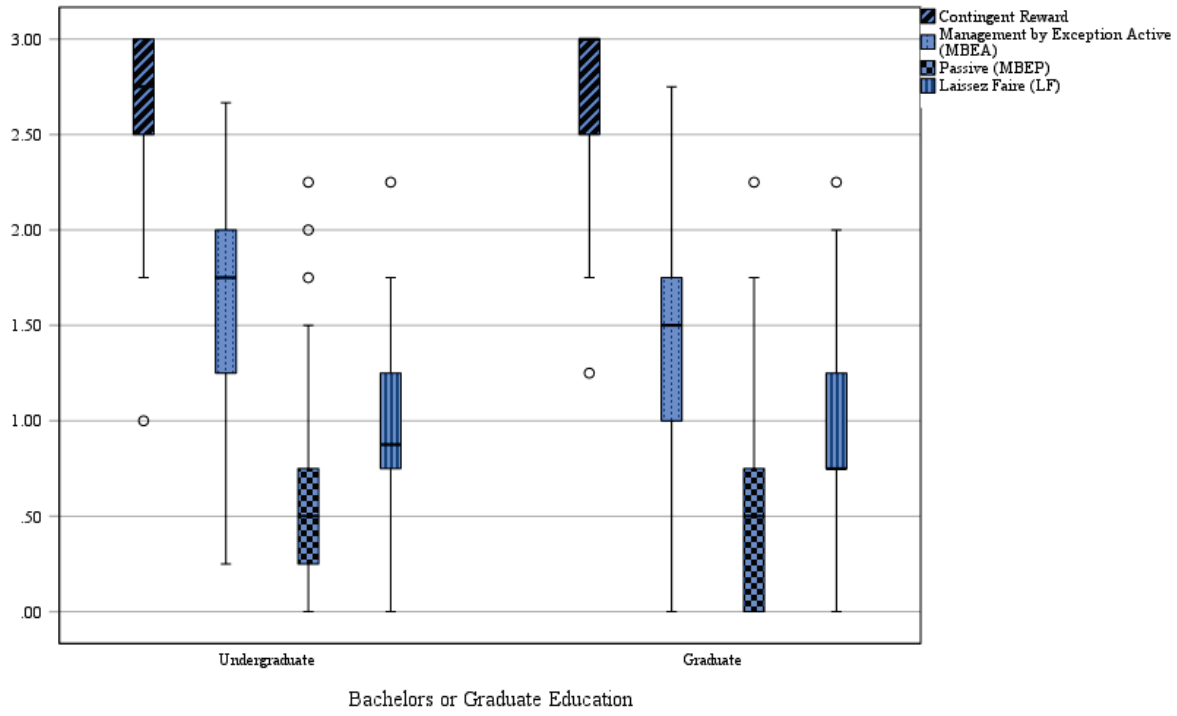
Levene's Test of Equality of Error Variances[a] **for Transformational Leadership by Level of Education Bachelors & Graduate**

		Levene Statistic	df1	df2	Sig.
Idealized Influence Attributes (IA)	Based on Mean	.917	1	139	.340
	Based on Median	.558	1	139	.456
	Based on Median and with adjusted df	.558	1	139	.456
	Based on trimmed mean	.409	1	139	.524
Idealized Behaviors	Based on Mean	.020	1	139	.887
	Based on Median	.082	1	139	.775
	Based on Median and with adjusted df	.082	1	136	.775
	Based on trimmed mean	.106	1	139	.746
Inspirational Motivation (IM)	Based on Mean	.010	1	139	.922
	Based on Median	.002	1	139	.962
	Based on Median and with adjusted df	.002	1	139	.962
	Based on trimmed mean	.018	1	139	.893
Intellectual Stimulation (IS)	Based on Mean	.153	1	139	.696
	Based on Median	.118	1	139	.731
	Based on Median and with adjusted df	.118	1	138	.731
	Based on trimmed mean	.105	1	139	.746
Individual Consideration (IC)	Based on Mean	2.817	1	139	.096
	Based on Median	.704	1	139	.403
	Based on Median and with adjusted df	.704	1	122	.403
	Based on trimmed mean	1.372	1	139	.243

Note. Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

Appendix K: Research Question 1b: MANOVA Assumption Testing, Boxplot, Shapiro-Wilk, Box M, and Levene's Test of Equality and the Robust Test of Equality of Means

Boxplot showing outliers for Transactional Leadership Dependent Variables by Level of Education, Undergraduate & Graduate



Shapiro–Wilk Test of Normality for Transactional Leadership by Levels of Education, Undergraduate & Graduate

Subscale	Level of Education	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Contingent Reward	Undergraduate	.257	50	<.001	.707	50	<.001
	Graduate	.305	91	<.001	.766	91	<.001
Management by Exception Active(MBEA)	Undergraduate	.135	50	.024	.966	50	.152
	Graduate	.153	91	<.001	.961	91	.007
Passive (MBEP)	Undergraduate	.177	50	<.001	.884	50	<.001
	Graduate	.165	91	<.001	.889	91	<.001
Laissez Faire (LF)	Undergraduate	.170	50	<.001	.937	50	.010
	Graduate	.210	91	<.001	.928	91	<.001

Box's Test of Equality of Covariance Matrices[a], Transactional Leadership Style by Education undergraduate and Graduate

Box's M	11.700
F	1.129
df1	10
df2	48202.648
Sig.	.335

Note. Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

***Levene's Test of Equality of Error Variances[a]* for Transactional Leadership by Level of Education Bachelors & Graduate**

		Levene Statistic	df1	df2	Sig.
Contingent Reward	Based on Mean	1.108	1	139	.294
	Based on Median	.347	1	139	.557
	Based on Median and with adjusted df	.347	1	135	.557
	Based on trimmed mean	1.081	1	139	.300
Management by Exception Active(MBEA)	Based on Mean	2.235	1	139	.137
	Based on Median	1.775	1	139	.185
	Based on Median and with adjusted df	1.775	1	138	.185
	Based on trimmed mean	2.033	1	139	.156
Passive (MBEP)	Based on Mean	.672	1	139	.414
	Based on Median	.230	1	139	.632
	Based on Median and with adjusted df	.230	1	128	.632
	Based on trimmed mean	.446	1	139	.505
Laissez Faire (LF)	Based on Mean	.025	1	139	.874
	Based on Median	.000	1	139	.994
	Based on Median and with adjusted df	.000	1	134	.994
	Based on trimmed mean	.022	1	139	.883

Note. Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

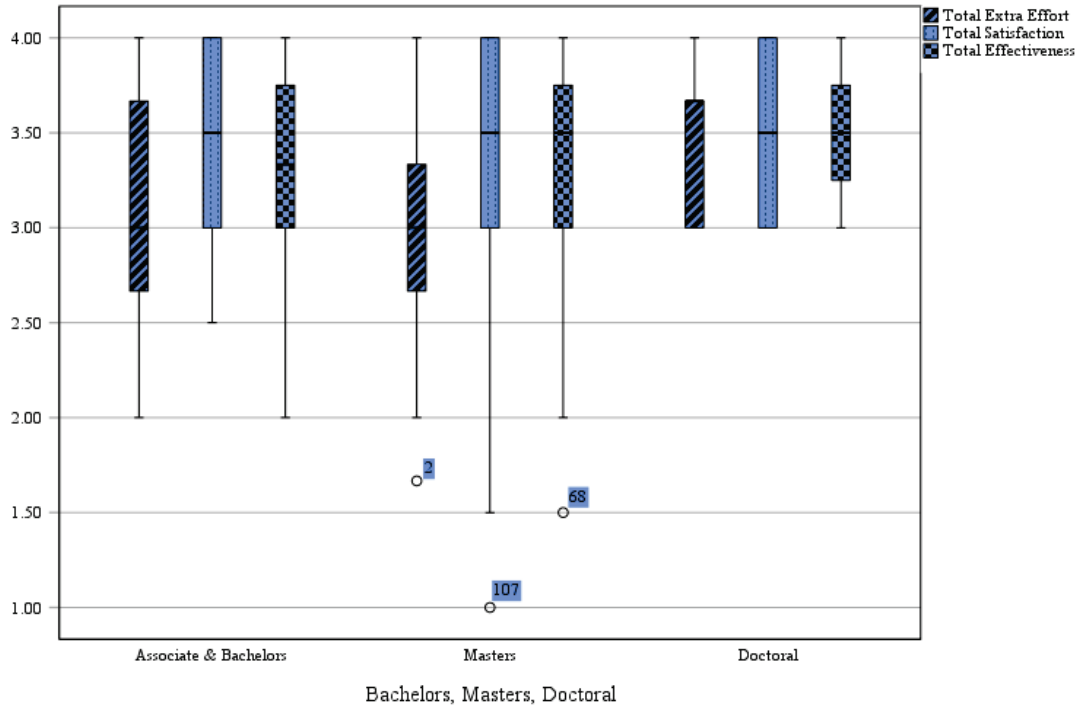
Robust Tests of Equality of Means for Transactional Leadership by Education Bachelors, Masters, and Doctoral

		Statistic[a]	df1	df2	Sig.
Contingent Reward	Welch	.153	2	22.735	.859
	Brown-Forsythe	.139	2	41.616	.871
Management by Exception Active(MBEA)	Welch	4.311	2	24.345	.*025
	Brown-Forsythe	4.771	2	55.266	.*012
Passive (MBEP)	Welch	.505	2	23.833	.610
	Brown-Forsythe	.586	2	57.400	.560
Laissez Faire (LF)	Welch	.446	2	21.706	.646
	Brown-Forsythe	.501	2	27.935	.611

Note. a. Asymptotically F distributed. *Significant result.

Appendix L: Research Question 1c: MANOVA Assumption Testing, Boxplot, Shapiro-Wilk, Box M, and Levene's Test of Equality

Boxplot showing outliers for Outcomes of Leadership Dependent Variable by Level of Education, Undergraduate & Graduate



Shapiro–Wilk Test of Normality for Outcomes of Leadership by Levels of Education, Undergraduate & Graduate

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Subscale	Level of Education	Statistic	df	Sig.	Statistic	df	Sig.
Total Extra Effort	Associate & Bachelors	.141	50	.014	.931	50	.006
	Masters	.140	82	<.001	.942	82	.001
	Doctoral	.280	9	.040	.844	9	.065
Total Satisfaction	Associate & Bachelors	.234	50	<.001	.837	50	<.001
	Masters	.203	82	<.001	.859	82	<.001
	Doctoral	.275	9	.048	.780	9	.012
Total Effectiveness	Associate & Bachelors	.146	50	.009	.941	50	.014
	Masters	.152	82	<.001	.909	82	<.001
	Doctoral	.156	9	.200*	.938	9	.557

Box's Test of Equality of Covariance Matrices[a] , Outcomes of Leadership by Education Levels

Box's M	16.777
F	2.722
df1	6
df2	67102.493
Sig.	.012

Note. Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

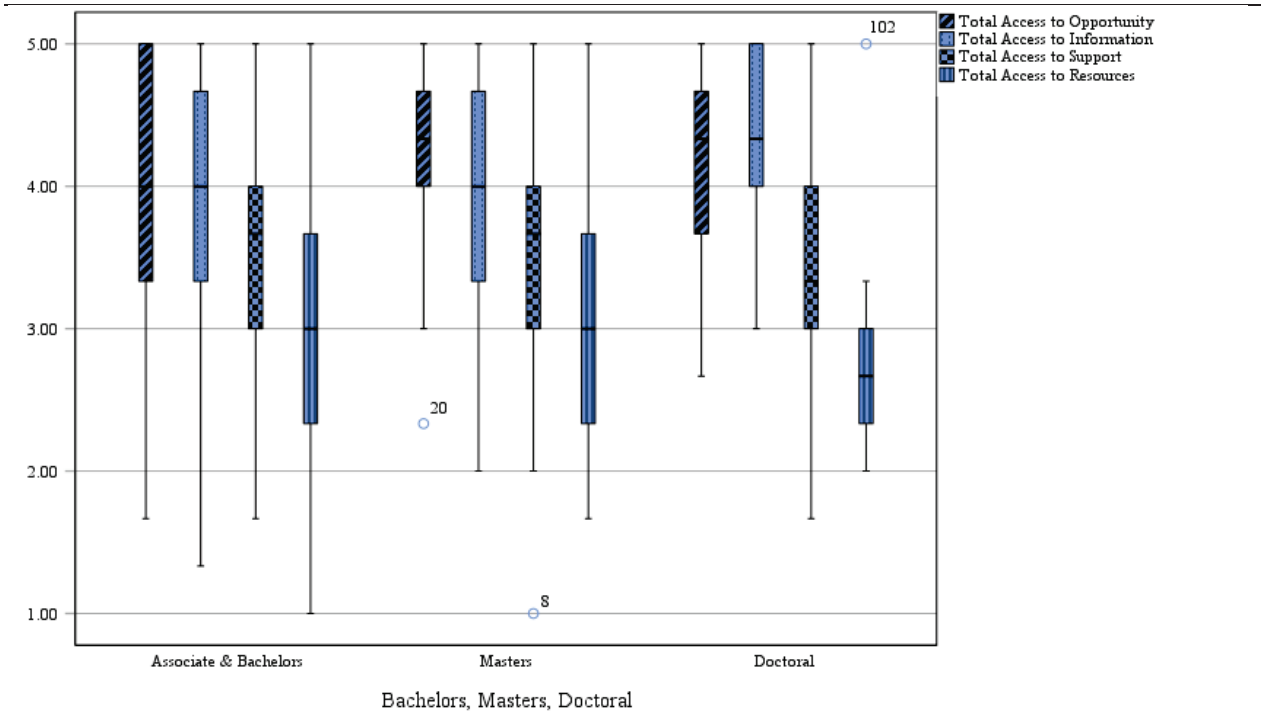
Levene's Test of Equality of Error Variances[a] for Outcomes of Leadership by Education

		Levene Statistic	df1	df2	Sig.
EE	Based on Mean	.004	1	139	.949
	Based on Median	.050	1	139	.823
	Based on Median and with adjusted df	.050	1	139	.823
	Based on trimmed mean	.002	1	139	.961
SAT	Based on Mean	4.874	1	139	.029
	Based on Median	2.184	1	139	.142
	Based on Median and with adjusted df	2.184	1	122	.142
	Based on trimmed mean	3.398	1	139	.067
EFF	Based on Mean	.050	1	139	.824
	Based on Median	.127	1	139	.722
	Based on Median and with adjusted df	.127	1	136	.722
	Based on trimmed mean	.065	1	139	.799

Note. Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

Appendix M: Research Question 2a: MANOVA Assumption Testing, Boxplot, Shapiro-Wilk, Box M, and Levene's Test of Equality

Boxplot showing outliers for Empowerment Dependent Variables by Level of Education, Undergraduate & Graduate



Shapiro – Wilk Test of Normality for Empowerment by Levels of Education, Undergraduate & Graduate

Subscales	Level of Education	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Total Access to Opportunity	Undergraduate	.150	50	.006	.907	50	<.001
	Graduate	.145	90	<.001	.910	90	<.001
Total Access to Information	Undergraduate	.106	50	.200*	.935	50	.008
	Graduate	.115	90	.005	.930	90	<.001
Total Access to Support	Undergraduate	.150	50	.007	.936	50	.009
	Graduate	.101	90	.024	.953	90	.003
Total Access to Resources	Undergraduate	.122	50	.061	.966	50	.158
	Graduate	.121	90	.002	.957	90	.004

Box's Test of Equality of Covariance Matrices[a] for Empowerment by levels of Education

Box's M	12.054
F	1.163
df1	10
df2	48429.690
Sig.	.311

Note. Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

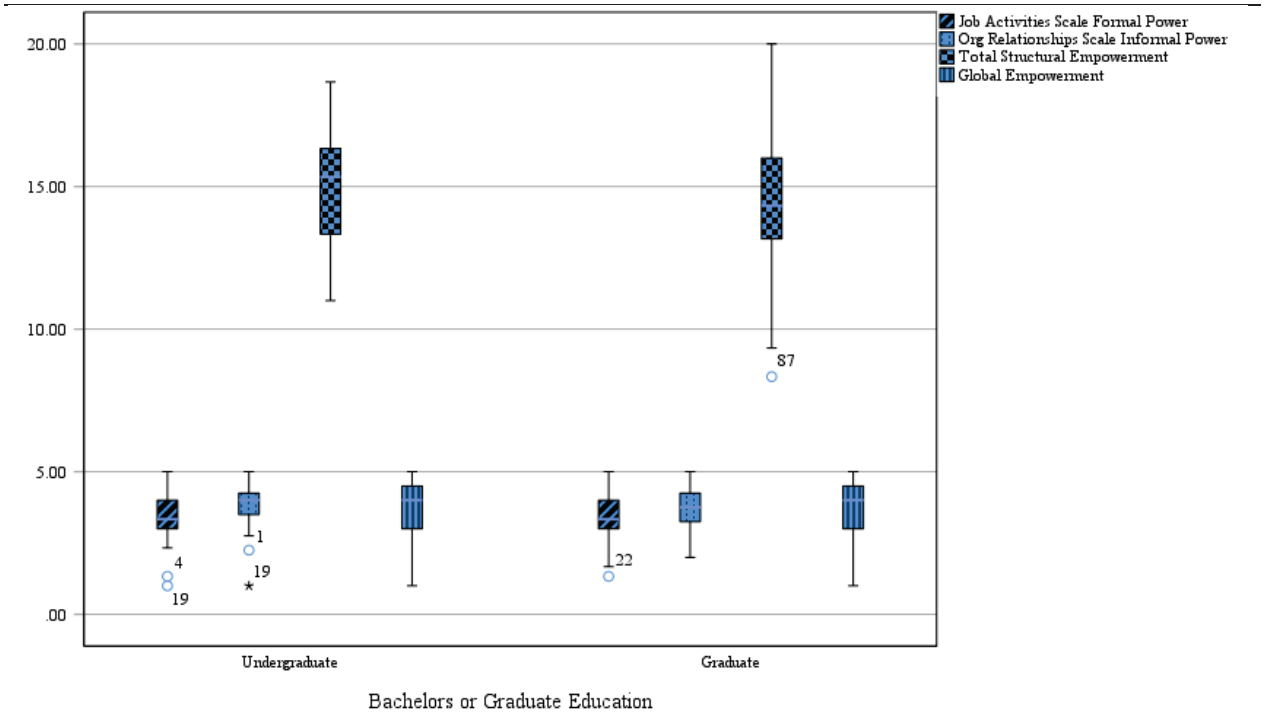
Levene's Test of Equality of Error Variances[a] **for Structural Empowerment by Level of Education Bachelors & Graduate**

		Levene Statistic	df1	df2	Sig.
Total Access to Opportunity	Based on Mean	4.462	1	138	.036
	Based on Median	4.813	1	138	.030
	Based on Median and with adjusted df	4.813	1	136.836	.030
	Based on trimmed mean	4.809	1	138	.030
Total Access to Information	Based on Mean	.870	1	138	.353
	Based on Median	.779	1	138	.379
	Based on Median and with adjusted df	.779	1	131.909	.379
	Based on trimmed mean	.898	1	138	.345
Total Access to Support	Based on Mean	.145	1	138	.704
	Based on Median	.162	1	138	.688
	Based on Median and with adjusted df	.162	1	136.767	.688
	Based on trimmed mean	.165	1	138	.685
Total Access to Resources	Based on Mean	1.837	1	138	.178
	Based on Median	1.379	1	138	.242
	Based on Median and with adjusted df	1.379	1	134.689	.242
	Based on trimmed mean	1.664	1	138	.199

Note. Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

Appendix N: Research Question 2b: MANOVA Assumption Testing, Boxplot, Shapiro-Wilk, Box M, and Levene's Test of Equality

Boxplot showing outliers for Empowerment Dependent Variables by Level of Education



Shapiro–Wilk Test of Normality for Empowerment by Levels of Education, Undergraduate & Graduate

Subscale	Level of Education	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Job Activities Scale	Undergraduate	.130	50	.033	.944	50	.019
Formal Power	Graduate	.154	91	<.001	.959	91	.006
Org Relationships Scale	Undergraduate	.153	50	.005	.931	50	.006
Informal Power	Graduate	.117	91	.004	.961	91	.009
Total Structural	Undergraduate	.116	50	.093	.966	50	.156
Empowerment	Graduate	.086	91	.091	.980	91	.165
Global Empowerment	Undergraduate	.146	50	.009	.906	50	<.001
	Graduate	.176	91	<.001	.934	91	<.001

Box's Test of Equality of Covariance Matrices[a]

Box's M	8.909
F	.860
df1	10
df2	48202.648
Sig.	.571

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

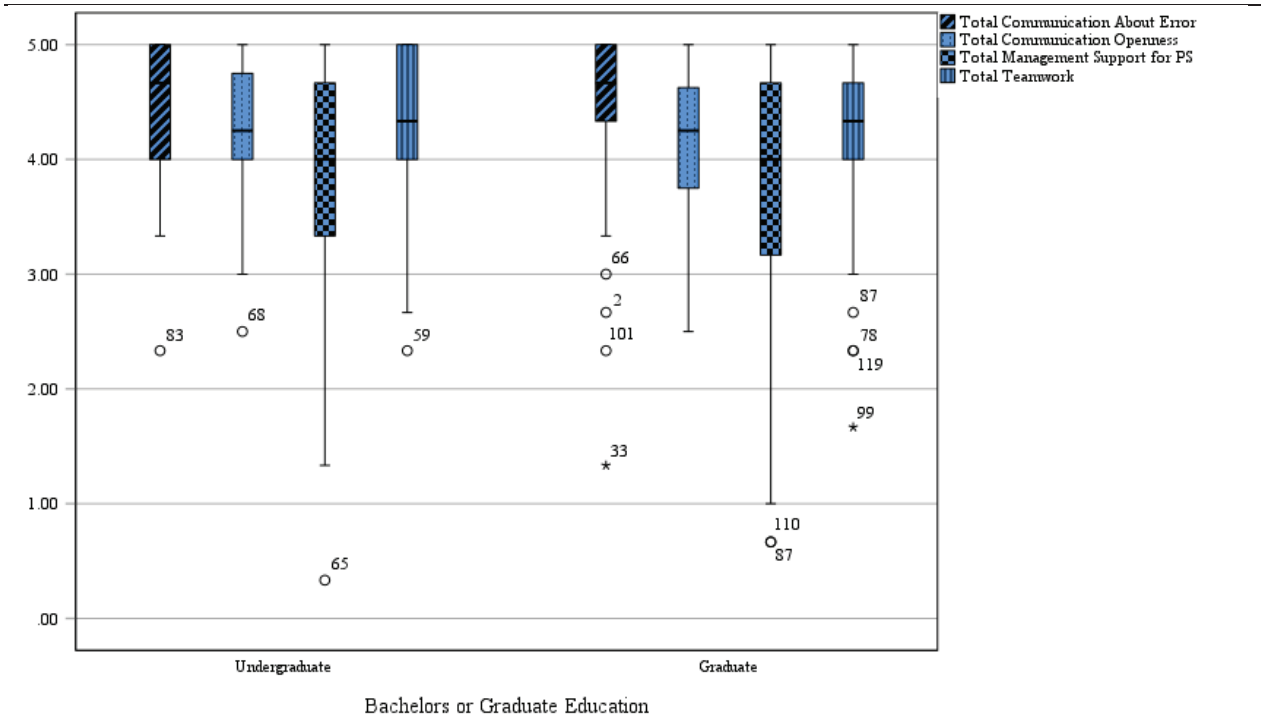
***Levene's Test of Equality of Error Variances*[a] for Empowerment by Level of Education Bachelors & Graduate**

		Levene Statistic	df1	df2	Sig.
Job Activities Scale Formal Power	Based on Mean	.061	1	139	.806
	Based on Median	.143	1	139	.705
	Based on Median and with adjusted df	.143	1	138.523	.705
	Based on trimmed mean	.055	1	139	.815
Org Relationships Scale Informal Power	Based on Mean	.140	1	139	.709
	Based on Median	.011	1	139	.916
	Based on Median and with adjusted df	.011	1	131.297	.916
	Based on trimmed mean	.100	1	139	.753
Total Structural Empowerment	Based on Mean	.402	1	139	.527
	Based on Median	.553	1	139	.458
	Based on Median and with adjusted df	.553	1	133.423	.458
	Based on trimmed mean	.428	1	139	.514
Global Empowerment	Based on Mean	.249	1	139	.619
	Based on Median	.163	1	139	.687
	Based on Median and with adjusted df	.163	1	138.793	.687
	Based on trimmed mean	.209	1	139	.648

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

Appendix O: Research Question 3: MANOVA Assumption Testing, Boxplot, Shapiro-Wilk, Box M, and Levene's Test of Equality

Boxplot showing outliers for Patient Safety dependent Variables by Level of Education



Shapiro – Wilk Test of Normality for Patient Safety by Levels of Education, Undergraduate & Graduate

	Bachelors or Graduate Education	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Total Communication About Error	Undergraduate	.226	50	<.001	.799	50	<.001
	Graduate	.217	91	<.001	.749	91	<.001
Total Communication Openness	Undergraduate	.143	50	.012	.920	50	.002
	Graduate	.123	91	.002	.951	91	.002
Total Management Support for PS	Undergraduate	.161	50	.002	.907	50	<.001
	Graduate	.177	91	<.001	.889	91	<.001
Total Teamwork	Undergraduate	.207	50	<.001	.868	50	<.001
	Graduate	.193	91	<.001	.867	91	<.001

Box's Test of Equality of Covariance Matrices[a] for Patient Safety by levels of Education

Box's M	7.700
F	.743
df1	10
df2	48202.648
Sig.	.684

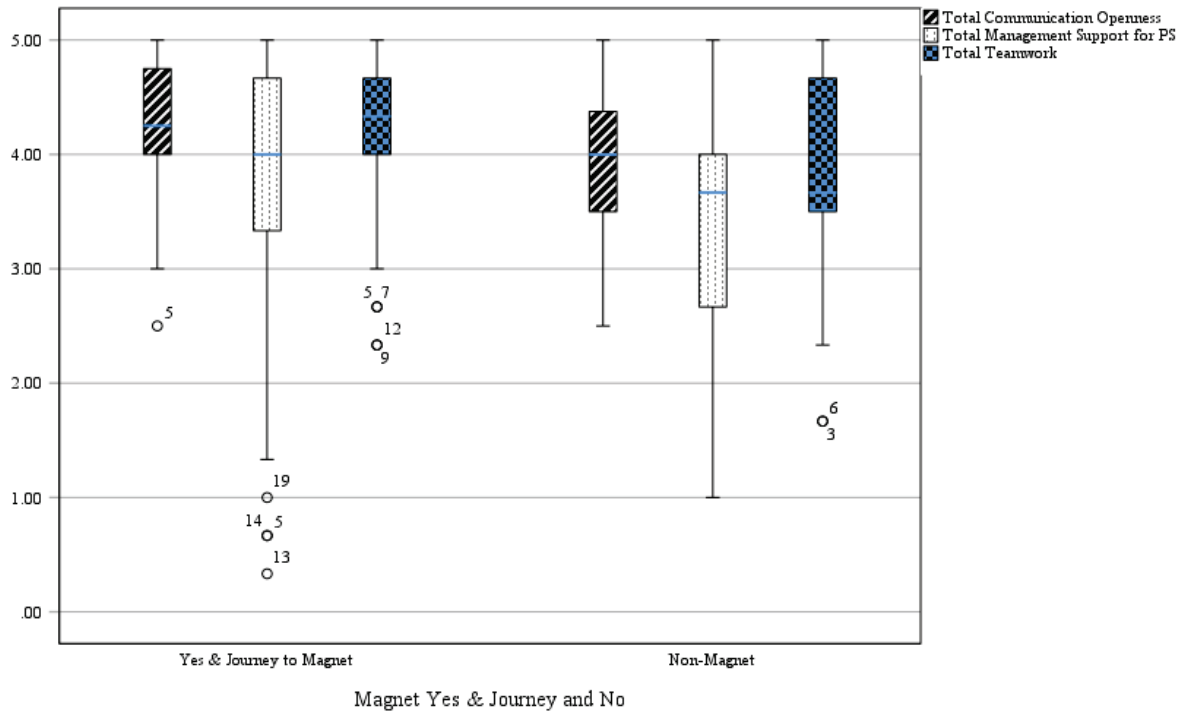
Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

Levene's Test of Equality of Error Variances[a] **for Patient Safety by Level of Education Bachelors & Graduate**

		Levene Statistic	df1	df2	Sig.
Total Communication About Error	Based on Mean	.016	1	139	.901
	Based on Median	.006	1	139	.937
	Based on Median and with adjusted df	.006	1	132.922	.937
	Based on trimmed mean	.005	1	139	.946
Total Communication Openness	Based on Mean	.036	1	139	.849
	Based on Median	.048	1	139	.828
	Based on Median and with adjusted df	.048	1	137.287	.828
	Based on trimmed mean	.048	1	139	.827
Total Management Support for PS	Based on Mean	.150	1	139	.699
	Based on Median	.183	1	139	.669
	Based on Median and with adjusted df	.183	1	138.841	.669
	Based on trimmed mean	.138	1	139	.711
Total Teamwork	Based on Mean	.913	1	139	.341
	Based on Median	.564	1	139	.454
	Based on Median and with adjusted df	.564	1	138.477	.454
	Based on trimmed mean	.453	1	139	.502

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

Appendix P: MANOVA Assumptions Testing for Magnet and Patient Safety: Boxplot, Shapiro-Wilk, Box M, and Levene's Test of Equality



Shapiro – Wilk Test of Normality for Patient Safety by Magnet-designation , Yes, Journey & No

	Magnet Yes & Journey and No	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Total Communication Openness	Yes & Journey to Magnet	.141	123	<.001	.943	123	<.001
	Non-Magnet	.109	19	.200*	.967	19	.719
Total Management Support for PS	Yes & Journey to Magnet	.172	123	<.001	.889	123	<.001
	Non-Magnet	.178	19	.116	.941	19	.279
Total Teamwork	Yes & Journey to Magnet	.188	123	<.001	.873	123	<.001
	Non-Magnet	.190	19	.070	.882	19	.023

*. This is a lower bound of the true significance.

Box's Test of Equality of Covariance Matrices[a] for Patient Safety by Magnet Status, Yes, Journey, & No.

Box's M	18.304
F	2.860
df1	6
df2	5673.796
Sig.	.009

Tests the null hypothesis that the observed covariance matrices of the dependent variables are eq across groups.

Levene's Test of Equality of Error Variances[a] For Patient Safety by Magnet designation, Yes, No, & Journey

		Levene Statistic	df1	df2	Sig.
Total Communication Openness	Based on Mean	1.876	1	140	.173
	Based on Median	1.613	1	140	.206
	Based on Median and with adjusted df	1.613	1	131.813	.206
	Based on trimmed mean	1.766	1	140	.186
Total Management Support for PS	Based on Mean	.165	1	140	.685
	Based on Median	.085	1	140	.771
	Based on Median and with adjusted df	.085	1	139.924	.771
	Based on trimmed mean	.128	1	140	.721
Total Teamwork	Based on Mean	9.472	1	140	.003
	Based on Median	8.074	1	140	.005
	Based on Median and with adjusted df	8.074	1	99.908	.005
	Based on trimmed mean	9.859	1	140	.002

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.