



January 2020

Nurse Leader Influence And Nurse-Sensitive Outcomes In Critical Access Hospitals

Jennifer Diane Eccles

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NURSE LEADER INFLUENCE AND NURSE-SENSITIVE OUTCOMES
IN CRITICAL ACCESS HOSPITALS

by

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A Dissertation

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

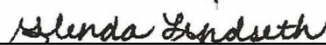
Doctor of Philosophy

Grand Forks, North Dakota

May
2020

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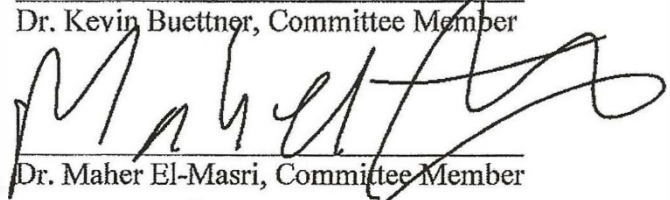
This dissertation, submitted by Jennifer Diane Eccles in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.



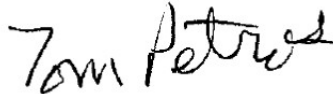
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PERMISSION

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Department College of Nursing and Professional Disciplines

Degree Doctor of Philosophy

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Jennifer D. Eccles
March 2020

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ACKNOWLEDGEMENTS

Knowing that many generations before me contributed to the conditions which gave me the ability to complete this doctoral degree, I give my humble thanks to those who came before and set the stage for the successes enjoyed today.

My most heartfelt appreciation goes to my parents, Dawn and Jim Eccles, whose commitment to knowledge and educational pursuits allowed me to succeed. To my father, who progressed through the fog of Alzheimer's and was called to God's Kingdom during this degree work, thank you for ceaselessly encouraging me, editing this dissertation, and modelling how to make significant contributions to the greater good. To my mother, my deepest love and thanks for your endless encouragement, support, love, nursing leadership knowledge, hours of listening, days of caring for me and my family to allow me to do school work, and your modelling of how to lead and persevere through adversity.

This work would also not have been possible without my husband, Bob Tweedy Jr., who fervently encouraged me to start, keep going, and complete this work. He engaged in scholarly debates with me to help grow my knowledge base. He edited, gave feedback, gave a shoulder, and took care of our family when I needed to concentrate. He encouraged me to continue through hard times, and took joy alongside me in the good times. His love and support were crucial to completion of this work. Thank you!

Acknowledgement also goes to my children: Ky Tweedy, Nico Tweedy, Peter Eccles, James Tweedy, and Piper Tweedy. They were gracious in losing time with me while I worked on

this dissertation and the courses leading up to it. They were also encouraging and supportive, often telling me, “You can do it, Mom!” My hope is that all of them have learned the value of higher education, the value of hard work, and that they will have the confidence and self-assurance to achieve their dreams. Their forgiveness in those times when I could not be present with them was so very necessary for this work to be accomplished.

Special acknowledgement to my sisters, Barb Eccles and Naomi Vondell, for their encouragement, time and expertise spent editing, legal perspectives and assistance, listening, and encouragement through this journey. They held me up in times when I was not sure I could continue. They were also sounding boards for ideas and concerns. Special thank you to them both for making this work possible.

My gratitude also goes to Pam and Paul Lambert, my mother-in-law and stepfather-in-law, who spent many days and sometimes nights caring for our children while I was working on this endeavor. They were sounding boards, offering perspectives to help me continue through to completion. Their unwavering support contributed to the success of this work.

A very special thank you to Jodi Ward from the Center for Rural Health. Jodi was supportive from the beginning through to the end. She offered her knowledge to allow a quality study and facilitated the ability to secure participants across the nation. She offered encouragement and assistance without which this research would not have been possible.

My heartfelt thanks goes to the Critical Access Hospital nurse leaders. These leaders have a unique role to play in maintaining the health of our rural populations, as you will read in this dissertation. They have extremely busy work lives, yet took the time to assist with this research.

My hope is that I have honored their contributions by increasing the scientific understanding of their roles, the support they need, and their unique positions in our healthcare system.

I also acknowledge those who financially supported my education overall. My employer, Minnesota State, was remarkable in their financial support of this learning. Thank you also to those who donated to create the scholarships which supported my doctoral nursing educational endeavors, including Dr. Gayle Roux, Dr. M. Louise Fitzpatrick and Mrs. Evelyn J. Barclay.

Special thank you to my classmates, especially Mrs. Penny Briese, Dr. Tim Fuss, Dr. Renee Colsch, and Mrs. Stephanie Orth, for their continuous and unwavering support. They were there for the scholarly debates, the laughs, the tears, and more laughs. Their support and encouragement kept me on the path to the finish line, and beyond.

Finally, my sincere thanks to the faculty and staff at the University of North Dakota for this learning opportunity. Special acknowledgement to Dr. Maher El-Masri for his many years of steadfast support and vast enthusiasm in imparting his knowledge of research and how it can help the world. Special thank you to Dr. Glenda Lindseth, for her many years of advice, support, and encouragement through this journey. And further gratitude to Dr. Kevin Buettner and Dr. Tom Petros for their advice and support through this journey.

To my mother and father, Dawn and Jim Eccles,
my husband, Bob Tweedy Jr.,
my children, Ky Tweedy, Nico Tweedy, Peter Eccles, James Tweedy, and Piper Tweedy,
and my sisters, Barbara Eccles and Naomi Vondell,
without whom this work would never have happened.

ABSTRACT

Introduction: Rural residents of the United States are sicker, are at higher risk of death, and have shorter lifespans than those in metropolitan areas (Singh & Siahpush, 2014). Nurse leaders may have the opportunity to influence improved patient outcomes in rural areas. No exploration of nurse leader influence as it relates to nurse-sensitive outcomes in rural healthcare settings was found in the literature. The purpose of this study was to determine the differences among nurse leader influence and nurse-sensitive outcome scores in critical access hospitals, which are rural in nature, in North Dakota as compared to other states in the United States.

Methods: A questionnaire was sent to nursing leaders at 600 critical access hospitals in 20 states in the United States, with results coming from a total of 19 states including North Dakota. The questionnaire included demographics, the Leadership Influence over the Professional Practices Environment Scale (LIPPES), nurse communication data from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey, and nursing transfer compliance data from the Emergency Department Transfer Communication (EDTC) survey. Reliability and validity have been established for these surveys. Results of the questionnaire were analyzed using descriptive statistics and comparison of means.

Results: The sample included 28 nurse leaders in North Dakota and 44 nurse leaders from across 18 other states. Demographics showed similarities across the two groups. All categories of nurse leader influence scores in North Dakota were lower than across the other 18 states. Significant differences were found among four nurse leader influence factors of collegial administrative

approach, internal strategy and resolve, access to resources, and the overall influence scores. No significant differences were among scores from the Emergency Department Transfer Communication (EDTC) compliance survey nor the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) compliance survey.

Conclusions: Critical access hospital nurse leaders in North Dakota reported comparatively lower collegial administrative approach, access to resources, and internal strategy and resolve levels than those in 18 other states. Support mechanisms should be concentrated on those areas for the leaders in North Dakota. Further research should be conducted to understand the potentially different needs of critical access hospital nurse leaders from their counterparts in larger hospital settings.

CHAPTER 1

INTRODUCTION

Rural residents of the United States are sicker, are at higher risk of death, and have shorter lifespans than those in metropolitan areas (Singh & Siahpush, 2014). Rural nurses, including nursing leaders, many of whom practice in critical access hospitals, have lower levels of education, they have less access to professional development, and patients have poorer outcomes (Bushy, 2005; Institute of Medicine [IOM], 2010; Skillman, Palazzo, Keepnews, & Hart, 2005). Lower levels of nurse education result in higher patient morbidity and mortality rates (Institute of Medicine [IOM], 2010; Skillman, Palazzo, Keepnews, & Hart, 2005). However, an exploration of nurse leader influence as it relates to nurse-sensitive outcomes in rural healthcare settings was not found in the literature. As well, a comparison of the differences among nurse leader influence characteristics in North Dakota as they compare to other states in the United States was not found. The Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives (MILE-ONE) (Adams, Ives Erickson, Jones & Paulo, 2009) and the Adams Influence Model (AIM) (Adams & Natarajan, 2016) provided the guiding frameworks for this study.

This chapter outlines the background of the problem, the specific research questions, the research strategy, the theoretical foundation, the definitions, the limitations, and the significance of the study.

Background

Infant mortality rates are 11% higher, child mortality rates are 41% higher, and mortality rates for adults aged 25-44 years are 36% higher in rural areas than in metropolitan areas of the United States (Singh & Siahpush, 2014). Also, all-cause mortality rates (death related to any

causation) are 16% higher, and premature mortality rates (death prior to age 75 years) are 26% higher (Singh & Siahpush, 2014) for rural residents than for metropolitan residents. Overall, rural residents die two years earlier than those who live in metropolitan counties in the United States (Singh & Siahpush, 2014). These disparities are worsening over time for all age groups, with the relative risk of death widening steadily from 1990 to 2009. It is also predicted that this gap will continue to widen in the future due to the current disparities of health in rural children (Sing and Siahpush, 2014). A goal of this study is to lay the basis for future work to focus on reversing this rise in disparities and to preserve rural resident health through the mitigating factor of nurse leadership influence on outcomes. This study begins a process to identify nursing leadership characteristics that significantly contribute to positive nurse-sensitive outcomes in rural critical access hospitals, and these characteristics may be highlighted for professional development in critical access hospital nursing leaders. This study explores the differences between influence characteristics in North Dakota as compared to other states, to find if information from an in-depth exploration of the population of critical access hospital nurse leaders in North Dakota may inform the state of the science for critical access hospital nurse leaders in other states. The information from this study may also inform targeted support efforts for the nursing leaders of North Dakota and elsewhere. Furthermore, because rural nursing is fundamentally different from urban and suburban nursing settings, current research conducted in urban and suburban settings may be inappropriate to generalize to rural settings, such as in critical access hospitals (Bish, Kenny & Nay, 2012; Bushy & Bushy, 2001; Havens, Warshawsky & Vasey, 2012; Long & Weinert, 1989).

The purpose of this study was to determine the differences among nurse leader influence and nurse-sensitive outcome scores in critical access hospitals in North Dakota as compared to

other states in the United States. This research was designed to enable future larger correlational studies of nurse leader influence compared to nurse-sensitive outcomes in critical access hospitals in the United States. Future research will be designed to inform the evidentiary base of the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives (MILE ONE) (Adams, Ives Erickson, Jones & Paulo, 2009) (Figure 2) as applied to rural environments.

In this research, the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives was explored. More specifically, the relationships between nurse leader influence, the professional practice work environment, and outcomes in critical access hospitals were examined. These relationships in rural settings are poorly understood and are likely quite unique (Bish, Kenny & Nay, 2012; Bish, Kenny & Nay, 2015; Bushy, 2012; Lee, Winters, Boland, Raph & Buehler, 2013; Long & Weinert, 1989; Williams, 2012). To inform future work on decreasing rural health disparities, this research informs the state of the science about nurse leader influence overall. This research also informs the state of the science with regards to the six subscales of nursing leadership characteristics of influence related to outcomes affected by nursing leadership, as measured in the Leadership Influence over Professional Practice Environments Scale.

Specific Aims

The purpose of this study was to examine nurse leader influence and nurse-sensitive outcome scores in critical access hospitals.

The specific aims for this dissertation study were to:

1. Determine demographics, nurse-leader influence scores, and nurse-sensitive outcome scores in critical access hospitals in the United States.

2. Analyze for differences in nurse leader influence scores in critical access hospitals in North Dakota and in critical access hospitals in other states.
3. Analyze for differences in nurse-sensitive outcome scores of nurse leaders in critical access hospitals in North Dakota and critical access hospitals in other states.

This study was planned to explore the differences between nurse leader influence and nurse-sensitive outcomes in critical access hospitals in North Dakota as compared to nurse leader influence and nurse-sensitive outcomes in critical access hospitals of other states in the United States.

Research Strategy

Significance

This study is important because the overall goal is to reduce health disparities in rural areas of the United States. There has been much research on the relationships between leadership influence and the professional practice work environment (PPWE) (Agnew & Flin, 2014; Batchellor, Zimmermann, Pappas & Adams, 2017; Ducharme, Bernhardt, Padula and Adams, 2017; McSherry, Pearce, Grimwood and McSherry, 2012; Melnyk, Hrabe and Buck, 2015; Wong & Cummings, 2007; Wong, Cummings & Ducharme, 2013). There has also been research comparing the professional practice work environment and outcomes (Aiken et al., 2011; Bae, 2011; Batchellor, Zimmermann, Pappas & Adams, 2017; Cramer, Jones & Hertzog, 2011; Wong & Cummings, 2007; Wong, Cummings & Ducharme, 2013). However, there is a gap in the research relating nurse leader influence and outcomes (Adams, Djukic, Gregas & Fryer, 2018; Batchellor, Zimmermann, Pappas & Adams, 2017; Wong, 2015). Research was not found that explored nursing leadership influence related to outcomes in the unique rural healthcare environment. Therefore, this study explored a concept area from the Model of the

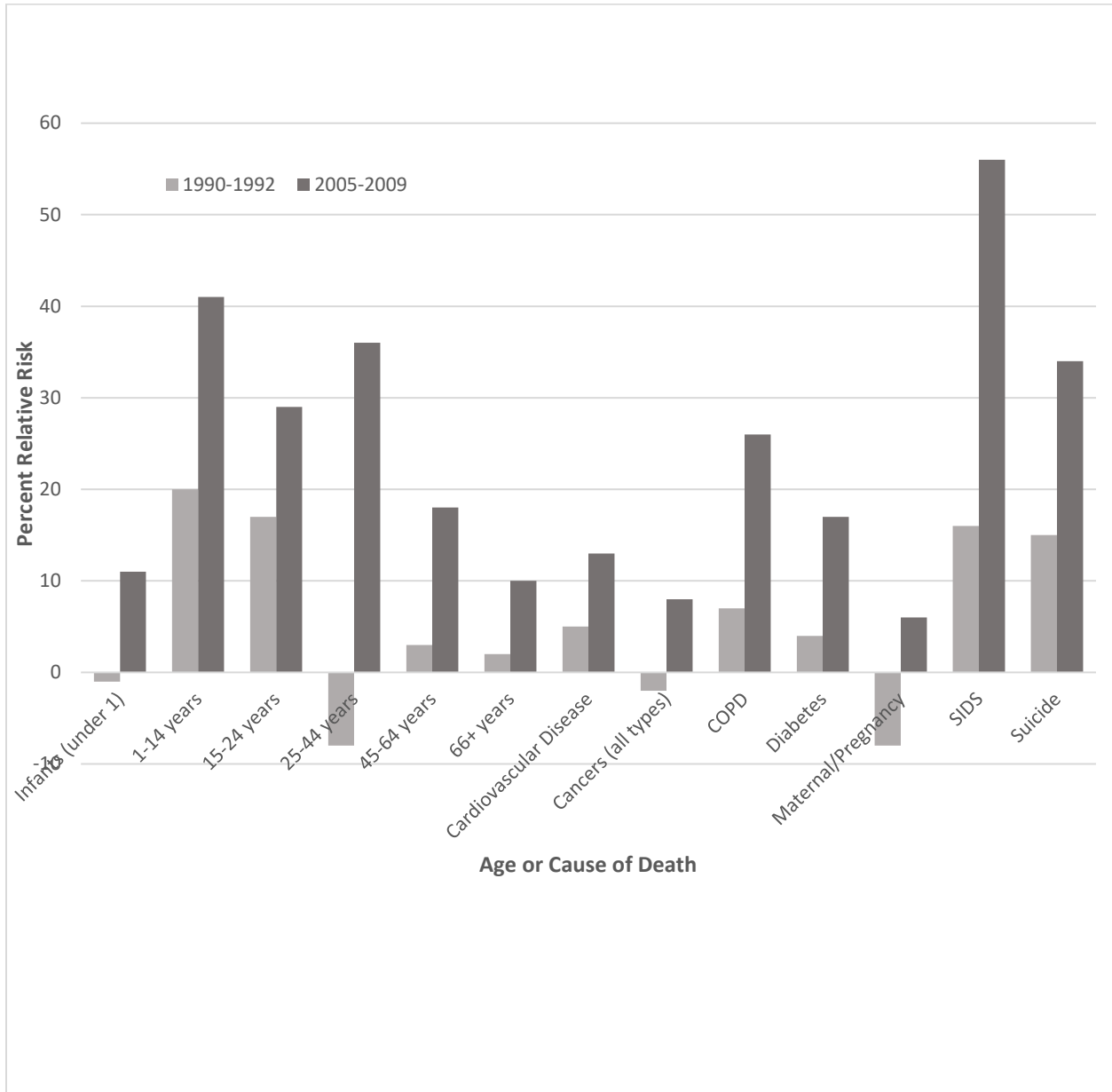
Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives to find relationships between nursing leadership and outcomes in rural settings.

Innovation and Impact

The importance of this study is highlighted by some past work comparing metropolitan to non-metropolitan areas. Although this work is not the same as comparisons between rural and non-rural areas, the results assist in building the case for nursing leadership research to be done in rural areas in addition to the research conducted in non-rural centers. This is because health disparities for residents of non-metropolitan counties in the United States are stark compared to those who live in metropolitan counties in the United States (Singh & Siahpush, 2014). In a landmark study of the US population, Singh and Siahpush (2014) compared data from the US Mortality Database from 1969 to 2009 to county-level population data, categorizing “metropolitan” as cities or counties of 20,000 or more and “non-metropolitan” as towns of less than 20,000 in population. Mortality risk rates across all age groups, as well as many causes of death, were significantly higher in non-metropolitan areas and have grown at an alarming rate in the past 30 years (Figure 1) (Singh & Siahpush, 2014). Critical access hospital leaders need more information about how their influence may improve these disparities and save lives.

Figure 1 shows relative rates of mortality in non-metropolitan areas expressed as percentages from zero, which represents mortality in metropolitan areas. For instance, in 1990-1992, the rate of infant death in non-metropolitan areas was 1% less than in metropolitan areas, and in 2005-2009 this rate was 11% higher than in metropolitan areas. Data were obtained from Singh and Siahpush (2014).

Figure 1. Relative Mortality Risk Rates.



The United States is currently focusing on healthcare reform, including the state of rural healthcare (Federal Office of Rural Health Policy, 2017). The American Academy of Nursing’s Expert Panel on Building Health Systems Excellence has a current mandate to work on the mechanisms by which nursing leadership influences outcomes (Batcheller, Zimmerman, Pappas, & Adams, 2017). In September, 2017, the concept of “influence” in the Adams Influence Model

(Adams & Natarajan, 2016) was adopted by the Expert Panel on Building Healthcare System Excellence as the model for a three-year project to effect changes in nursing policy, practice, education, research and theory through educating, implementing and evaluating nursing influence (J.M. Adams, personal communication, October 10, 2017). However, the unique needs of rural nursing leaders are not yet part of this work (J.M. Adams, personal communication, October 10, 2017). This research study was designed to bring rural nursing leadership issues to the forefront, and to provide evidentiary support for the current focus on nurse leader influence by the Expert Panel on Building Healthcare System Excellence. The study was designed to determine differences among nursing leadership influences and outcomes in critical access hospitals in North Dakota as compared to other states in the United States. By definition, because of the nature of critical access hospitals being in rural areas, all of these nursing leaders work in rural hospitals in each state. This comparison study was important because there are no published data that show that a large sample of critical access hospital nursing leaders in North Dakota is representative of critical access hospital nursing leaders in other states across the United States. This study provides evidence that data collected in North Dakota may inform the state of the science surrounding nurse leadership influence in critical access hospitals elsewhere in the United States. These data are anticipated to be helpful in establishing a business case for future research studies.

In the current study there are seven independent variables measuring nursing leadership influence, expressed as ordinal Likert-type results from the Leadership Influence over Professional Practice Environments Scale (LIPPES): LIPPES overall score, collegial administrative approach, internal strategy and resolve, authority, access to resources, leadership expectations, and status (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013). There are

two dependent variables of nurse-sensitive quality indicators expressed as continuous percentage rates: Emergency Department Transfer Communications Quality Measure 6: nurse-generated information, and patient satisfaction reports of patients who reported their nurses "Always" communicated well.

Potential to Impact Patient Outcomes. This study has the potential to impact rural patient outcomes by informing a future program of research, including the case for the unique rural health environment, and highlighting this work to the American Academy of Nursing's Expert Panel on Building Healthcare System Excellence.

Adams & Natarajan (2016) state that understanding how nursing leaders influence patient outcomes may have a substantial impact on improving health. The long-term impact of this study was to improve patient outcomes in rural settings by providing evidence for further research to support nursing leadership in critical access hospitals. Although some research has been conducted to study direct or indirect relationships between overall leadership influence and outcomes (Adams & Natarajan, 2016; Agnew & Flin, 2014; Fealy, McNamara, Casey, O'Connor, Patton, Doyle, & Quinlan, 2013; Frumenti & Kurtz, 2014; McSherry, Pearce, Grimwood, & McSherry, 2012; Wong & Cummings, 2007; Wong, Cummings & Ducharme, 2013; Wong & Giallonardo, 2013), there is a dearth of research in rural settings. By exploring the critical access hospital nurse leader influence characteristics and nurse-sensitive outcomes in North Dakota, and the differences of those as compared to other states in the United States, a case may be developed for future correlational research. Also, by providing evidence for which characteristics of leadership influence are significantly related to positive outcomes, a program of further experimental research may be conducted to infer causality. This program of research has the potential to test support programs intended to focus on improved patient outcomes. This

also has the potential of quantifying the financial case for enhanced leadership support funded by lowered healthcare costs due to improved patient outcomes.

Potential to Influence Leadership Practice Changes. Critical access hospital nursing leaders exist in professional isolation from peers in larger centers, yet are driven and innovative in how they seek to reduce this isolation (Williams, 2012). The National Rural Health Association (2017a) includes the critical access hospitals in their work, especially with a national annual conference specifically for critical access hospital learning and networking. Most states have a critical access hospital or rural health network, allowing leaders to collaborate in best practices (National Rural Health Association, 2017b). However, there continue to be struggles in defining specific practices to improve patient outcomes in rural areas. With rural health being unique from urban settings (Long & Weinert, 1989), it follows that rural nursing leadership must also be unique and cannot simply adopt urban nursing leadership practices without adapting those practices to the rural environment.

Operational Definitions. The following operational definitions apply in this study:

- **Critical access hospitals (CAHs):** A critical access hospital is a hospital defined by the Centers for Medicare and Medicaid Services. Eligibility requirements for this designation include having 25 or fewer acute care inpatient beds, located more than 35 miles from another hospital (with few exceptions), an annual average acute care length of stay of 96 hours or less, and 24/7 emergency care services. This designation is designed to improve access to essential healthcare in rural settings (Rural Health Information Hub, 2019b).
- **Influence:** The ability of a person to affect the chosen ideas, actions and beliefs of another based on the concepts of authority, knowledge-based competence, communication traits, status and/or use of timing (Adams & Natarajan, 2016; Adams, Nikolaev, Ives Erickson,

Ditomassi & Jones, 2013). Influence will be measured using the Leadership Influence over the Professional Practice Environment Scale (LIPPES).

- Nursing Leaders in critical access hospitals: The Chief Nursing Officer or registered nurse who has administrative authority and responsibility for nursing department operations. These leaders will be accessed via leaders of Medicare Rural Hospital Flexibility (Flex) programs who work with critical access hospitals on quality outcome reporting.
- Nurse-Sensitive Outcomes: Outcomes “that are relevant, based on nurses’ scope and domain of practice, and for which there is empirical evidence linking nursing inputs and interventions to the outcomes” (Doran, 2003, p. vii). Nurse-Sensitive Outcomes will be measured using nurse communication data from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) compliance survey, and nursing transfer compliance data from the Emergency Department Transfer Communication (EDTC) compliance survey.
- Rural: The United States Census Bureau definition of rural was used. This definition encompasses more of the population than other agencies’ definitions, allowing for a more generalized view of rurality. In this definition, rural means all geographic areas and people not within urban areas of 2,500 or more. (United States Census Bureau, 2010)
- Medicare Rural Hospital Flexibility (Flex) program: A program developed by the Balanced Budget Act of 1997 to create Critical Access Hospitals and provide grant funding for quality improvement and reporting, performance improvement and benchmarking, designation of Critical Access Hospitals, improved population health, and rural emergency medical services. (National Rural Health Resource Center, 2019)

Each of the variables will be further defined in Chapter 2.

Innovation. This research was innovative as it is the first study to assess critical access hospital rural nursing leadership characteristics and nurse-sensitive outcomes in the rural critical access hospital environment. Because the rural environment is uniquely different from other settings (Long & Weinert, 1989; Williams, 2012), findings from studies done in non-rural settings cannot be universally applied to rural healthcare.

Rural nursing leadership

In 2012, Bish, Kenny and Nay completed a scoping review of 17 articles meeting review criteria out of a base of 4235 research articles found on initial electronic database search. This review used an established and tested method for interpretive scoping reviews. The review is a scoping review, not a systemic review, and so it did not critically analyze the research; however, the findings correlate with findings of other researchers. Key terms for the search were “nursing,” “leadership,” and “rural” with several inclusion criteria. Discussed below, Bish, Kenny and Nay (2012) identified four emerging themes: expectations of rural nursing leadership, the need for a highly educated workforce, competing interests, and partnering within rural healthcare systems.

Expectations of rural nursing leaders. The expectations of rural nursing leadership include the need for leaders to support frontline staff managing a greater variety of patient care needs (Bish, Kenny & Nay, 2012; Bish, Kenny & Nay, 2015; Havens, Warshawsky & Vasey, 2012; Warren & Smalley, 2014). With the smaller rural patient population there is a large range of health issues presented to a small number of nursing and allied health staff. This requires nursing leaders to be flexible and collaborative while also having a wide range of knowledge, being active listeners, taking risks, and remaining accessible (Bish, Kenny & Nay, 2012). It

requires frontline staff to act both as generalists and as specialists, as they care for patients of all ages, deal with a full range of diagnoses, and contend with a greater variety of chronic health needs with fewer healthcare resources (Havens, Warshawsky & Vasey, 2012). The rural nursing leader has greater responsibility to support, educate, recruit and retain a qualified nursing workforce (Havens, Warshawsky & Vasey, 2012).

Highly educated workforce need in rural nursing. The diversity of patient care needs in rural areas also creates a need for a healthcare workforce, including nursing leadership, with high levels of education and experience to meet these needs (Bish, Kenny & Nay, 2012; Bushy and Bushy, 2001; Havens, Warshawsky & Vasey, 2012). Unfortunately, rural nursing leaders and healthcare personnel generally have lower levels of education compared to those in more urban areas (Bish, Kenny & Nay, 2012; Hauenstein, Glick, Kane, Kulbok, Barbero, & Cox, 2014; Newhouse, Morlock, Pronovost & Sproat, 2011; Skillman, Palazzo, Keepnews, & Hart, 2006; Warren & Smalley, 2014). In addition, there is professional isolation, less support for nursing leaders, and professional-development isolation in small rural hospitals (Williams, 2012; Wolf & Delao, 2013).

Competing interests in rural nursing. Competing interests are inherent in the rural nurse leadership role (Bish, Kenny & Nay, 2012). Many in rural settings identify a lack of trust toward outsiders (Warren & Smalley, 2014) and toward new technology (Bish, Kenny & Nay, 2012). Rural nursing leaders must take these concepts into account when allocating funding toward increased access to non-local services, such as telemedicine (Warren & Smalley, 2014). For instance, allocating funding toward telemedicine may seem fiscally responsible, but if such technology and “outsiders” are not trusted, face-to-face interactions may have more clinical value (Bish, Kenny & Nay, 2012).

Partnering in rural healthcare. Partnering within rural healthcare systems is the fourth theme identified by Bish, Kenny and Nay (2012). The nursing leader is often part of the rural community, yet also a supervisor and caregiver for community members (Bish, Kenny & Nay, 2012; Bish, Kenny & Nay, 2015; Warren & Smalley, 2014). Due to such close relationships among community professionals, and professional isolation in rural settings (Williams, 2012; Wolf & Delao, 2013), support systems develop inter-professionally among a relatively small group (Bish, Kenny & Nay, 2012).

Conceptual Framework to Guide this Study

The Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives (MILE ONE) (Adams et al., 2009) forms the conceptual framework for this research. In the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives (Figure 2), three conceptual areas form a triangle of influence, with each side affecting the next clockwise side (Adams et al., 2009). Using this model, ultimately the influence of the nursing leader affects patient outcomes indirectly via the professional practice work environment, and the nursing leader is directly affected by patient outcomes.

By influencing improvement in the professional practice work environment, leaders also improve aspects of the Quadruple Aim (Berwick, Nolan & Whittington, 2008): the health of populations, to improve individual care, and to reduce health care costs. Thus, the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives identifies the professional practice work environment as a mediator of the gold standard components of the Triple Aim: “improving the individual experience of care; improving the health of populations; and reducing the per capita costs of health care” (Berwick, Nolan & Whittington, 2008, p. 760). The Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse

Executives also provides additional clarification to the newly-established Quadruple Aim, which includes the fourth concept “improving the work life of those who deliver care” (Bodenheimer & Sinsky, 2014, p. 575). The Quadruple Aim includes the three components of the Triple Aim, adding in the above fourth component (Bodenheimer & Sinsky, 2014). These four components were designed to improve the health of the population through healthcare quality improvement (Berwick, Nolan & Whittington, 2008). For more than nine years, the Triple Aim served as the gold standard, which included “improving the individual experience of care; improving the health of populations; and reducing the per capita costs of health care” (Berwick, Nolan & Whittington, 2008, p. 760). However, Bodenheimer and Sinsky (2014, p. 575) added, “improving the work life of those who deliver care” to round out the Quadruple Aim. Batcheller, Zimmermann, Pappas and Adams (2017) highlight how the Quadruple Aim has been adopted by many influential organizations, including: the American Nurses’ Association (ANA), the American Association of Critical Care Nurses (AACCN), the American Academy of Nursing (AAN), Emory Healthcare, the Dana-Farber Cancer Institute, the American Association of Colleges of Nursing (AACN), and health care leaders. These four constructs, including joy in the workplace, influence improved patient outcomes (Batcheller, Zimmermann, Pappas & Adams (2017). The concept of influencing improved patient outcomes is understood to be necessary in improving population health, but the methods to create this influence need further study, especially in rural settings.

The three concept areas in the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives (Figure 2) are described in the next sections especially in relation to Critical Access Hospital settings.

Figure 2. The Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives (MILE ONE)



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Concept Area 1: Nurse Leader Influences the Professional Practice Work Environment

The Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives identifies the nurse leader as one who influences the professional practice work environment, empowering nurses through collaborative decision-making, visionary leadership, and role autonomy (Adams, Ives Erickson, Jones & Paulo, 2009). The nurse leader

also recognizes different staff paradigms, such as cultural or generational differences, and flexes leadership styles in creating a supportive atmosphere (Adams, Ives Erickson, Jones & Paulo, 2009).

In critical access hospitals, there is generally one nurse leader who has operational responsibility for staffing up to 25 beds (Rural Health Information Hub, 2019b). The workforce is relatively small compared to urban hospital settings, creating close relationships among nurse leaders, nurses, and allied health professionals (Williams, 2012). This setting has potential to create trusting and positive relationships and show distinctive results when the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives is applied.

Concept Area 2: Professional Practice Work Environment Influences Patient and Organizational Outcomes

The Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives incorporates research measuring the nursing professional practice work environment, using a multitude of studies that have recognized data supporting that a positive professional practice work environment results in improved patient outcomes (Aiken et al., 2011; Batchellor, Zimmermann, Pappas & Adams, 2017; Cramer, Jones & Hertzog, 2011; Wong & Cummings, 2007; Wong, Cummings & Ducharme, 2013). The professional practice work environment is recognized by the American Nurses Credentialing Center Magnet Recognition Program®, in which a shared-governance model creates a healthy work environment, resulting in improved patient safety and outcomes (American Nurses Credentialing Center, 2017). The professional practice work environment is also part of the Quadruple Aim to improve healthcare outcomes, which consists of “improving the individual experience of care; improving the health of populations; and reducing the per capita costs of health care” (Berwick, Nolan, &

Whittington, 2008, p. 760) and “improving the work life of those who deliver care” (Bodenheimer & Sinsky, 2014, p. 575).

The weight of the evidence supporting the influence of a positive professional practice work environment on improved patient outcomes may translate to the rural setting. Hegney, Eley, Osseiran-Moisson and Francis (2015) found minimal differences in professional practice work environment perception among non-rural, rural, and remote nurses. The authors studied personal well-being and professional practice work environment amongst nurses in rural and non-rural settings of Queensland, Australia. This study included 1008 nurses in non-rural areas, 382 in rural areas, and 238 in remote areas. Participants completed five psychometrically validated and reliable scales to assess well-being and the professional practice work environment. Results showed that non-rural nurses and rural nurses were not significantly different in their perceptions of well-being and professional practice work environment in “stress, anxiety, depression, compassion, satisfaction, burnout, resilience” (p. 359), participation in hospital affairs, nurse manager abilities, staffing/resources, and collegial nurse-physician relationships (Hegney, Eley, Osseiran-Moisson & Francis, 2015). While remote nurses had lower secondary traumatic stress, non-rural nurses were more positive about nursing involvement in quality of care (Hegney, Eley, Osseiran-Moisson & Francis, 2015). These few differences support that the perception of positivity, once realized, is assumed to be quite similar in rural and non-rural environments. Testing of this assumption was beyond the scope of this research study and should be part of a larger program of rural research.

Concept Area 3: Patient and Organizational Outcomes Influence the Nurse Leader

A patient outcome that influences the nurse leader is a newer, innovative and mostly unexplored concept in the literature (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013).

The Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives follows the classical standard with the nurse leader influencing the work environment that creates outcomes (Donabedian, 1966). However, this takes the pathway one step further, wrapping around in a feedback loop to conceptualize how outcomes influence the nurse leader (Adams, Ives Erickson, Jones & Paulo, 2009). In the critical access hospital setting, the nurse leader is often a close member of the community in a leader role (Warren & Smalley, 2014). With positive outcomes, the leader may function using different styles and behaviors than when outcomes are negative (Adams, Ives Erickson, Jones & Paulo, 2009; Sebastian & Allensworth, 2012), and this phenomenon is potentially heightened in a smaller community setting. It is this innovative relationship that was the subject of this research into differences found between the critical access hospital nurse leader influence characteristics and nurse-sensitive outcomes in North Dakota as compared to other states in the United States.

Although this study was originally situated only in North Dakota, the expansion to other states in the United States was important to understand potential differences between North Dakota Critical Access Hospital Nursing Leaders and nursing leaders in other states. Although, by definition, Critical Access Hospitals are located in rural settings, this does not mean that information from rural settings in North Dakota will inform the state of the science in rural settings in other states. Rural settings from state to state are different from one another (The Aspen Institute, 2019). As an example, rural populations are often thought of as agricultural societies, yet only 5% of the rural workforce in the United States works in agriculture (The Aspen Institute, 2019). Economic drivers, culture, social, and health outcomes differ among different rural settings and from state to state (The Aspen Institute, 2019).

With this in mind, the question arose as to whether North Dakota critical access hospital nurse leader influence would be similar to that of other states in the United States. North Dakota has a unique situation of hosting the Rural Health Information Hub at the University of North Dakota, with support from the Health Resources and Services Administration of the United States Department of Health and Human Services (Rural Health Information Hub, 2019a). The presence of the Rural Health Information Hub results in a strong network of nursing leaders among the critical access hospitals across North Dakota, allowing for sampling of a large percentage of the population. Such opportunities for in-depth convenience sampling in other states are often non-existent. For instance, in North Dakota, connecting with critical access hospital nursing leaders can be as simple as sending an email out to the group; but, in some other states, to connect to those nursing leaders one must phone the individual hospitals' general numbers one by one. Such differences in networks lead to disparities in the ability to obtain a large percentage of each state's population in comparison to the highly networked critical access hospital community in North Dakota. Therefore, a comparison of the more in-depth sample in North Dakota to the samples from other participating states contributes new knowledge regarding the applicability of the results from North Dakota to other areas of the United States.

Shifting Paradigms

This research was a shift in the paradigm of how to assess leadership quality. There are numerous studies and mechanisms to assess concept area one of the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives, namely leadership quality influencing the professional practice work environment, using the perceptions of peers and subordinates to the leader (Agnew & Flin, 2014; Fealy et al., 2013; Frumenti & Kurtz, 2014; Wong & Giallonardo, 2013). However, since quality patient care is the ultimate

goal of any healthcare professional, the measurement of nursing leader effectiveness should not stop at assessment of the professional practice work environment, but should ultimately reside in assessment of patient and organizational outcomes.

This study focused on the shift in paradigms illustrated by the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives in concept area three: the influence of outcomes on the nursing leader (Adams, Ives Erickson, Jones & Paulo, 2009). With this change from the classical model ending at the outcomes stage (Donabedian, 1966), further study and focus are required in order to understand the relationships between the feedback loop of leadership influence and outcomes. Though there is some research into the mechanisms by which nursing leaders affect outcomes (Batcheller, Zimmerman, Pappas, & Adams, 2017; Wong & Cummings, 2007; Wong, Cummings & Ducharme, 2013), there is little research into how this occurs in rural settings, where the leadership environment is different (Williams, 2012).

Novel Theoretical Approaches

The application of the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives to a rural setting is unique to this study. Long and Weinert (1989) identified differences in rural nursing to include beliefs about work and health, a strong sense of self-reliance, a lack of anonymity, isolation, and trust issues with outsiders and newcomers. In the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives, Long and Weinert's (1989) key concepts could play a role. For instance, a nurse leader who has recently moved to the area versus one who is an insider may need to create influence in different ways. The following sections will relate how these key concepts apply to the rural nature of this research study.

The concept of influence is inherent in the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives. With this concept as the basis, the Leadership Influence of Professional Practice Environment Scale (LIPPES) (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013) was used to correlate nursing leadership influence to nurse-sensitive outcomes. Although studies have used the Leadership Influence of Professional Practice Environment Scale to assess relationships between leadership influence and the professional practice work environment (Adams & Natarajan, 2016), this is the first study to assess perceptions of leadership influence and nurse-sensitive outcomes in the rural setting.

This research was designed to assist nursing leaders in critical access hospitals to understand how their influence and critical access hospital outcomes may be related. Because rural settings are fundamentally different from metropolitan nursing settings in which similar research has occurred (Adams, Djukic, Gregas, & Fryer, 2018), this research was designed specifically for the unique rural setting of the critical access hospital. This study was supported by past research in this field, as reviewed in the following chapter.

Limitations

Limitations in this study include issues related to the small sample size and distinct nature of the sample. The sample size was not large enough to allow for generalizable findings in regards to the potential relationships among characteristics of influence and nurse-sensitive outcomes. There should be no overall generalizations or recommended nursing practice actions based on the findings of this study. As well, the sample included nursing leaders from only nineteen of the fifty states in the United States, which could result in selection bias. Some nursing leaders are involved in networks of nursing leaders from critical access hospitals across their regions. Because of this, it may be possible that past networking opportunities could lead to

some homogeneity of the responses across the sample. As well, the responses from nursing leaders in these states may be different from responses in other geographical areas, especially if a strong network of the nursing leaders was not present in those states where there was no participation. To mitigate issues from these limitations, no generalizations or recommendations for nursing practice change will be made based on this research study.

Another limitation is the potential lack of diversity in the sample in regards to racial and ethnic diversity as well as gender diversity. Responses may be different for people from different racial and ethnic groups, and from different gender identities.

Assumptions

Assumptions in this study included the assumption that the participants were answering the survey truthfully and that the participant surveyed was the person completing the survey. Although it is impossible to assess the veracity of responses, it is noted that the survey instrument has been validated in previous research studies, and that this instrument was administered in the same manner in previous studies as it was in this study.

Another assumption involves the measured attributes in this study. The concept of “influence” is complex, with many variables inherent in the concept. This study assumes that the concept of influence is truly measurable. As well, this study assumes that the outcomes measured are true representations of actions occurring in each hospital and have been reported according to reporting standards in use across all institutions.

Summary

Nursing leaders have the potential to influence outcomes and improve quality of patient care. Much research has been conducted on how nursing leaders influence the professional practice work environment, and how the professional practice work environment affects

outcomes (Adams & Natarajan, 2016; Agnew & Flin, 2014; Fealy, McNamara, Casey, O'Connor, Patton, Doyle & Quinlan, 2013; Frumentti & Kurtz, 2014; McSherry, Pearce, Grimwood & McSherry, 2012; Wong & Cummings, 2007; Wong, Cummings & Ducharme, 2013; Wong & Giallonardo, 2013). However, there is a gap in evidence regarding how nursing leader influence affects, or is affected by, outcomes. Also, there is a gap in the evidence surrounding differences in both influence and outcomes in rural areas in different states. In rural areas of the United States, morbidity and mortality rates are significantly higher than in metropolitan areas, and are projected to worsen over time (Singh & Siahpush, 2014). This study was designed to assess the feasibility of conducting a larger national study to explore relationships among rural nursing leadership influence and outcomes in critical access hospitals, by first exploring potential differences in North Dakota as compared to other states.

This dissertation is divided into five chapters. The next chapter, chapter 2, includes a literature review highlighting the need for this research to address the gap in knowledge surrounding nurse leadership influence in rural areas of the United States and the theoretical foundation for the study. Chapter 3 includes the research methods with the design and plan for data analysis. Chapter 4 presents the results of the data analysis for each specific aim. And Chapter 5 details the conclusions of the study based on the data analysis.

CHAPTER 2

LITERATURE REVIEW

The purpose of this descriptive, comparative study was to examine nurse leader influence and nurse-sensitive patient outcome scores in critical access hospitals. The specific aims for this dissertation study were to:

1. Determine demographics, nurse-leader influence scores, and nurse-sensitive outcome scores in critical access hospitals in the United States.
2. Analyze for differences in nurse leader influence scores in critical access hospitals in North Dakota and in critical access hospitals in other states.
3. Analyze for differences in nurse-sensitive outcome scores of nurse leaders in critical access hospitals in North Dakota and critical access hospitals in other states.

Rural counties in the United States have poorer health outcomes in comparison to larger urban centers (Long & Weinert, 1989; Singh & Siahpush, 2014). Critical access hospitals (CAHs) play an important role in caring for residents of rural America, often being the only available option for local healthcare in rural counties (Rural Health Information Hub, 2019b). However, the rural healthcare environment is unique and different from more urban healthcare settings (Long & Weinert, 1989; Nelson-Brantley, Ford, Miller & Bott, 2018; National Rural Health Association, 2018; Newhouse, Morlock, Pronovost & Sproat, 2011; Rural Health Information Hub, 2019b). Therefore, research conducted within rural environments is essential to improve quality care for the rural population.

This literature review embeds the unique qualities of rural health settings into concepts of nursing leadership in order to provide a description of previous work done to address nursing leadership in rural settings. In a seminal work, Long and Weinert (1989) identified unique

approaches to health care in rural communities. Using a mixed-methods approach with a series of ethnographic studies in Montana, and surveys using psychometrically analyzed scales of a convenience sample of 62 participants, Long and Weinert (1989) identified rural nursing theory concepts of: “work beliefs and health beliefs, isolation and distance, self-reliance, lack of anonymity, outsider/insider, and old timer/newcomer” (p. 262). These concepts have become a basis for research in rural health, recognizing rural health settings as unique and fundamentally different from non-rural settings (Lee, Winters, Boland, Raph & Buehler, 2013).

Nursing Leadership Influence in the Rural Environment

A scoping review of rural nursing leadership issues identified seventeen studies, published in peer-reviewed journals, focusing on nursing leadership within a rural context (Bish, Kenny & Nay, 2012). In this review four themes emerged: expectations of rural nursing leadership, a highly educated workforce, competing interests, and partnering within rural healthcare systems (Bish, Kenny & Nay, 2012). Further research concerning nursing leadership directly related to patient outcomes is sparse (Adams, Djukic, Gregas & Fryer, 2018; Agnew & Flin, 2014; Fealy et al., 2013; Frumenti & Kurtz, 2014; Swanson, 2015; Wong & Giallonardo, 2013), with no studies identified that specifically address rural settings.

To enable a rural focus on nursing leadership influence on patient outcomes via the professional practice work environment, this literature review combines Bish, Kenny and Nay’s (2012) four themes of rural nursing leadership with the Leadership Influence over Professional Practice Environments Scale attributes of: collegial administrative approach, internal strategy and resolve, authority, access to resources, leadership expectations, and status (Adams & Natarajan, 2016).

Collegial administrative approach. Collegial Administrative Approach is defined as “a relationship-based leadership where synergy and equality are emphasized in lieu of hierarchical position” (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013, p. 263). In a rural setting, the inherent nature of relationship-based interactions in the professional practice work environment is a defining characteristic (Long & Weinert, 1989). Bish, Kenny and Nay (2012) identify partnering within rural healthcare systems as a well-developed theme in rural nursing leadership research. Rural nursing leaders are often well-regarded members of the community in addition to providing a caregiver role, and must balance these close relationships in a different way than a more urban nursing leader who may not be as visible within the urban community (Bish, Kenny & Nay, 2012; Bish, Kenny & Nay, 2015; Lauder, Reel, Farmer & Griggs, 2006; Warren & Smalley, 2014).

Internal strategy and resolve. The operational definition of Internal Strategy and Resolve is “self-determining characteristics, fortitude, and planning” (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013, p. 263). This component relates strongly to Long and Weinert’s (1989) rural nursing theoretical concept of self-reliance and independence among the rural population. Rural residents view fulfilling a role within the community as a primary function, with perceptions of health related to their ability to maintain their role (Long & Weinert, 1989). In the role of the rural nursing leader, Long and Weinert’s (1989) identified concepts of self-reliance, independence, and role fulfillment fit well within the operational definition of Internal Strategy and Resolve, especially related to commitment, internal motivation, persistence, confidence and visionary approach (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013).

Authority. Authority is a component of the Adams Influence Model (Adams & Natarajan, 2009), and is defined in the Leadership Influence over Professional Practice Environments Scale as “the right to take action requiring an accountability and responsibility” (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013, p. 263). In this subscale, nursing leaders’ perceptions of their responsibility, accountability to others, and obligations are measured especially in regards to the professional practice work environment (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013). In a close-knit rural community, the partnering relationships add extra obligation to nursing leaders’ supervisory, social, and community roles within this setting (Bish, Kenny & Nay, 2012; Crosby, Wendel, Vanderpool, Casey & Mills, 2012). The nurse leader needs to build social capital within the rural community and professional group in order to be accepted and trusted as a community insider in the leadership role (Crosby, Wendel, Vanderpool, Casey and Mills, 2012; Long & Weinert, 1989).

Access to resources. This Leadership Influence over Professional Practice Environments Scale subscale is defined as “the ability to garner necessary information, workforce support, finances, capital goods, or other assets” (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013, p. 264). Professional isolation experienced in rural nursing settings (Williams, 2012) leads to challenges for nursing leaders to enable professional development opportunities, professional networks, and higher education for staff (Newhouse, Morlock, Pronovost & Sproat, 2011). Hospital funding models are normally case-based, which can lead to financial struggles for rural hospitals (Newhouse, Morlock, Pronovost & Sproat, 2011; Rural Health Information Hub, 2019b). However, the funding model for critical access hospitals is cost-based in an effort to maintain service in rural communities (Nelson-Brantley, Ford, Miller & Bott, 2018; Newhouse, Morlock, Pronovost & Sproat, 2011; Rural Health Information Hub, 2019b). With this study

based solely in the critical access hospital setting, access to financial resources may be less of a concern than in other rural healthcare settings. However, critical access hospitals still struggle financially to support new graduate nurses (Nelson-Brantley, Ford, Miller & Bott, 2018). Also, access to highly educated human resources is more difficult in rural settings (Bish, Kenny & Nay, 2012; Hauenstein, Glick, Kane, et. al., 2014; ; Nelson-Brantley, Ford, Miller & Bott, 2018; Newhouse, Morlock, Pronovost & Sproat, 2011; Skillman, Palazzo, Keepnews & Hart, 2006; Warren & Smalley, 2014). In addition, Bish, Kenny and Nay (2012) and Nelson-Brantley, Ford, Miller and Bott (2018) describe diversity of patient needs in the rural population, requiring a smaller number of professionals to have a wider knowledge base to meet the patients' needs.

Leadership expectations. The Leadership Influence over Professional Practice Environments Scale subscale of Leadership Expectations, defined as the “presumptive requirement for subordinate self-governance and authority over individual and team practices” (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013, p. 263), encompasses having control, requiring responsibility and accountability from others, and understanding cultural differences. This subscale is related to Bish, Kenny and Nay’s (2012) scoping review which identified a theme of expectations of rural leadership including having a global perspective, decision-making skills, and collaborative and team-building skills. Although these skills are inherent in general for nursing leadership (McSherry, Pearce, Grimwood & McSherry, 2012), the professional isolation associated with the rural setting increases the need for a depth to the nursing leader’s abilities to maintain their role and social capital as leader (Crosby, Wendel, Vanderpool, Casey & Mills, 2012; Williams, 2012; Wolf & Delao, 2013).

Status. Status is another feature of the Leadership Influence over Professional Practice Environments Scale (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013) and Adams

Influence Model (Adams & Natarajan, 2016), defined as “having high standing or prestige identified through hierarchical position, key relationships, and/or reputation” (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013, p. 263). In the rural setting, status is affected by partnering relationships as defined by Bish, Kenny and Nay (2012). With the smaller group of professionals in the rural setting, close relationships affecting status within the professional practice work environment develop in both inter-professional and social portions of the community (Williams, 2012).

Nurse-Sensitive Patient Outcomes

The National Quality Forum set the standard for nurse-sensitive quality indicators originally in 2004, in a seminal work with the purpose of identifying a national consensus standard for nursing-sensitive care (National Quality Forum, 2004). However, since 2004 there has been much change; for example, the Centers for Medicare and Medicaid Services (Centers for Medicare and Medicaid, 2017a) now require reporting on quality indicators, including nurse-sensitive indicators and base rates of reimbursement for non-critical access hospitals on this reporting. Despite these changes, critical access hospitals are not required to report their results for reimbursement purposes (Rural Health Information Hub, 2019b). In 2014, the Centers for Medicare and Medicaid identified the following nurse-sensitive quality measures as reporting requirements: patient safety events including hospital-acquired pressure ulcer rates and postoperative hip fracture rates expressed as a percentage, and healthcare-acquired infections including catheter-associated urinary tract infection rates (CAUTI) and central line associated blood stream infection rates (CLABSI), (Centers for Medicare and Medicaid, 2017a; Rajaram, Barnard and Bilimoria, 2015). Although some critical access hospitals collect and report these quality measures, with the low number of acute care beds (less than 25) and the relatively short

stay for patients (must be an annual average of less than 96 hours) (Centers for Medicare and Medicaid, 2017a), one reported incident shows as a very high expressed percentage. For instance, one catheter-associated urinary tract infection could show as a 20% infection rate if only five patients received catheters in that quarter. In addition, one fewer infections of this nature would show as a zero percent infection rate. Therefore, these quality measures for patient outcomes are not appropriate to this study in the critical access hospital environment.

Generally, hospital reimbursement rates from the Centers for Medicare and Medicaid are also dependent on patient satisfaction results, as reported in the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS). Although not required for their funding model, critical access hospitals in North Dakota and elsewhere use Hospital Consumer Assessment of Healthcare Providers and Systems surveys regularly as a report to the North Dakota Critical Access Hospital Quality Network (Center for Rural Health, 2018) and to local state quality networks. The Hospital Consumer Assessment of Healthcare Providers and Systems includes patient satisfaction reports of percentages of patients who reported that their nurses "Always" communicated well (Centers for Medicare and Medicaid, 2017b). Nurse communication has been identified as a nurse-sensitive indicator of quality (Amey, Burlingame, Welch, Moakler & Fahey, 2017; Swan & McGinley, 2016). The entire Hospital Consumer Assessment of Healthcare Providers and Systems survey is located in Appendix A.

Nurse-Sensitive Patient Outcomes in Critical Access Hospitals

Because Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) are not required for critical access hospital funding purposes, and the nurse-sensitive quality indicators developed by the Center for Medicare and Medicaid Services are not practical for critical access hospitals, the Medicare Beneficiary Quality Improvement Project (MBQIP),

administered by the Medicare Rural Hospital Flexibility (Flex) grant program, was developed to inform quality across critical access hospitals, and is endorsed by the National Quality Forum (Center for Rural Health, 2018b; Stratis Health, 2017). As part of this program, critical access hospitals are required to measure Emergency Department Transfer Communication (EDTC). Emergency Department Transfer Communication measures are also part of state Quality Network support systems, which support critical access hospitals with quality improvement and Medicare Beneficiary Quality Improvement Program (MBQIP) requirements (Center for Rural Health, 2018a). The Emergency Department Transfer Communication measures began in 2014, with the recognition that quality measures required of larger non-rural hospitals were inappropriate in small rural healthcare settings. However, the emergency department is of particular importance in such small rural hospitals due to the high percentage of patients requiring transfer to larger centers (Stratis Health, 2017). Although Emergency Department Transfer Communication reporting by critical access hospitals has been voluntary nationally, every critical access hospital in North Dakota reports Emergency Department Transfer Communication measures to the North Dakota Flex Program and North Dakota Critical Access Hospital Quality Network (Center for Rural Health, 2018b). Nationally, the Medicare Beneficiary Quality Improvement Program (MBQIP) has an agenda for 100% of critical access hospitals to report Emergency Department Transfer Communication and other quality improvement data; however, this has yet to be achieved (Center for Rural Health, 2018b). This situation makes North Dakota an important state to study due to their 100% participation rates.

The Emergency Department Transfer Communication survey (Stratis Health, 2017) includes seven measures, each with subcomponents, scored with one point given for each subcomponent successfully met within 60 minutes of transfer, and then reported as a percentage

score (Stratis Health, 2014). For the purposes of this study, Emergency Department Transfer Communication-6 Nurse Generated Information (EDTC-6) will be used as a nurse-sensitive indicator of quality. In this measure, there are six subcomponents that include: nursing notes, sensory impairments, catheters and intravenous lines, immobilizations, respiratory support, and oral restrictions (Klingner & Moscovice, 2012; Stratis Health, 2014).

Therefore, the dependent variables chosen to represent nurse-sensitive outcomes in this study are nurse-to-patient communication as measured by the Hospital Consumer Assessment of Healthcare Providers and Systems, and communication of nurse-generated information within 60 minutes of transfer from a critical access hospital emergency department to a tertiary level of care as measured by Emergency Department Transfer Communication-6.

Critical Access Hospitals

Critical access hospitals have positive impacts on the health of rural communities not only through their direct healthcare services, but also via their economic impacts.

A critical access hospital is designated as such by the Centers for Medicare and Medicaid Services. Eligibility requirements for this designation include having 25 or fewer acute care inpatient beds, located more than 35 miles from another hospital (with few exceptions, including mountainous regions), an annual average acute care length of stay of 96 hours or less, and 24/7 emergency care services. This designation is designed to improve access to essential healthcare in rural settings (Rural Health Information Hub, 2019b).

Critical Access Hospitals meet serious needs in rural communities. As of October 11, 2019, there were 1,349 critical access hospitals in 45 states in the United States (Flex Monitoring Team, 2019). Not only are critical access hospitals the center of healthcare for rural communities, but they are also the basis for a healthy local economy (Doeksen, St. Clair &

Eilrich, 2016), which combats poverty and other social determinants of health within rural populations (The Aspen Institute, 2019). In a study of 91 critical access hospitals across 18 states, Doeksen, St. Clair and Eilrich (2016) found that, on average, a critical access hospital has a total annual impact on the local economy of 170 jobs and \$7.1 million from hospital operations. In these rural communities, approximately ten to fifteen percent of jobs are in the health sector (Doeksen, St. Clair & Eilrich, 2016).

The economic impact of critical access hospitals is an added positive impact to the health of rural populations. The Aspen Institute Community Strategies Group (The Aspen Institute, 2019) reported the results of an interview-based study of 43 different Rural Development Hubs to explore building capacity for rural community and economic development to improve equity, health and prosperity in the rural communities. The results highlighted how positive economic impacts have positive impacts on the overall health of the rural population (The Aspen Institute, 2019). With this understanding, the overall positive economic impact of critical access hospitals to the community (Doeksen, St. Clair & Eilrich, 2016) serves to elevate the health status of the population.

Critical Access Hospital Networks in North Dakota and Other States

There are varied densities of critical access hospitals across the United States. The density depends on geographic differences, with some states having varied sizes and locations of rural settings. North Dakota has 36 critical access hospitals and is fortunate to host the Rural Health Information Hub (RHIHub), the North Dakota Critical Access Hospital Quality Network, and the North Dakota Flex Monitoring Team (Center for Rural Health, 2018; Rural Health Information Hub, 2019b). The North Dakota Critical Access Hospital Quality Network maintains current contact information for critical access hospital nursing leaders across the state, including

facilitation of statewide meetings with these leaders (Center for Rural Health, 2018). As previously stated, in a rural setting the inherent nature of relationship-based interactions is a defining characteristic (Long & Weinert, 1989). It is the strong relationships among the North Dakota Critical Access Hospital Quality Network and the critical access hospital nursing leaders that is predicted to enable in-depth participation in a study endorsed by the Network.

The Federal Office of Rural Health Policy (FORHP) and the Health Resources and Services Administration (HRSA) have funded grants for other several states to develop rural health networks (National Rural Health Resource Center, 2019). Notably, a review of developed networks reveals several differences across the country. Some rural health networks are in place for geographic portions of a state or multiple states, while some focus on specific subjects, such as mental health or health informatics (National Rural Health Resource Center, 2019). No requirement was found for every state to have a Critical Access Hospital Quality Network similar to what is in North Dakota. Thus, the personal relationships built among the critical access hospital nursing leaders and the staff of the North Dakota Critical Access Hospital Quality Network were not found to be widely duplicated, limiting the prediction of in-depth participation in a study not endorsed by someone with such a personal relationship, which is key in rural settings (Long & Wienert, 1989).

Nurse Leader Influence Measurement in Critical Access Hospitals in North Dakota vs. Other States

The predicted in-depth measurement of nurse leader influence of a large percentage of the population of nursing leaders in critical access hospitals in North Dakota is encouraging in regards to the ability to make inferences to the population of nursing leaders in North Dakota. However, because there are only 36 critical access hospitals in North Dakota, even 100%

participation of these nursing leaders would result in a sample size too small to make general inferences outside of North Dakota with a high degree of statistical reliability unless the effect sizes of the nurse leader influence on the outcome variables were quite large (Polit & Beck, 2012).

Therefore, an important aspect to consider was whether the results of measurement of nurse leader influence would be different in a group of nursing leaders where a larger portion of the population responded, such as is predicted in a convenience sample in North Dakota (Center for Rural Health, 2018), in comparison to a group of nursing leaders where a smaller portion of the population responded, such as is predicted in a convenience sample from states other than North Dakota (National Rural Health Resource Center, 2019).

Along with this, knowledge of previously completed research in nurse leader influence as compared to the professional practice environment and patient outcomes, and how these studies related to the critical access hospital rural environments, was necessary. As previously identified, research concerning nursing leadership directly related to patient outcomes is sparse (Adams, Djukic, Gregas & Fryer, 2018; Agnew & Flin, 2014; Fealy et al., 2013; Frumenti & Kurtz, 2014; Swanson, 2015; Wong & Giallonardo, 2013), with no studies identified that specifically address rural settings.

Preliminary Studies

To locate previously completed research correlating nursing leadership, the professional practice work environment, and patient outcomes, the principal investigator for this study completed a systematic review of the literature. The review expanded on a systematic review by Wong, Cummings and Ducharme (2013) to add four nursing studies (Agnew & Flin, 2014; Fealy, McNamara, Casey, O'Connor, Patton, Doyle & Quinlan, 2013; Frumenti & Kurtz, 2014;

Wong & Giallonardo, 2013). The review also sought research on leadership styles and behaviors compared to outcomes in disciplines other than nursing and healthcare, resulting in four studies in the field of education (May, Huff & Goldring, 2012; Savvides & Pashiardis, 2016; Sebastian & Allensworth, 2012; Walker, Lee & Bryant, 2014) and one in the business field (Hagen & Park, 2013). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards were used to guide this systematic review, ensuring assessment of reliability, validity, risk of bias, and other items in the PRISMA Checklist 2009 (Moher, Liberati, Tetzlaff & Altman, 2009). All nine studies found correlations among leadership characteristics, work environment, and outcomes. None of the studies inferred causality except May, Huff and Goldring (2012), who suggested a reciprocal effect of student outcomes in a high school affecting how high school leadership behaved in stating, “We believe the more plausible causal relationship is that school context drives principal’s activities” (p. 433). This was interesting, as it is similar to the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives’ concept of a feedback loop with patient outcomes influencing leadership (Adams & Natarajan, 2016). During this work, particular attention was applied to find any similar research studies in rural settings. None were found.

Study Characteristics and Results of Individual Studies

Each article was analyzed to extract characteristics, which included: professional field, research purpose and questions, study design, subjects, sampling methods, measurement instruments, reliability and validity, risk of bias, analysis, leadership measures, significant and non-significant results, and discussion and recommendations.

Synthesis of results.

Professional field. Of the nine studies, four were in the field of education (May, Huff & Goldring, 2012; Savvides & Pashiardis, 2016; Sebastian & Allensworth, 2012; Walker, Lee & Bryant, 2014), four within nursing (Agnew & Flin, 2014; Fealy, McNamara, Casey, O'Connor, Patton, Doyle & Quinlan, 2013; Frumenti & Kurtz, 2014; Wong & Giallonardo, 2013), and one in business, specifically project management (Hagen & Park, 2013). There were no studies located in the other fields included in the electronic database search (Appendix B). This study was situated in the field of rural nursing, in an effort to contribute to the state of the science in this field.

Study design and sampling methods. There were seven quantitative studies (Frumenti & Kurtz, 2014; Hagen & Park, 2013; May, Huff & Goldring, 2012; Savvides & Pashiardis, 2016; Sebastian & Allensworth, 2012; Walker, Lee & Bryant, 2014; Wong & Giallonardo, 2013), one mixed-methods study (Agnew & Flin, 2014), and one qualitative study (Fealy et al., 2013). The qualitative research used a case study approach with purposive sampling, completing focus groups and individual interviews (Fealy et al., 2013). The mixed-methods study used what appeared to be a phenomenological approach to interview participants, and then used those findings to create a correlational quantitative study (Agnew & Flin, 2014). The quantitative studies used various designs with few similarities in strategies. Across studies, there were no noted similarities in theoretical frameworks. Sampling in quantitative designs was mostly convenience sampling, with one noted random sampling across a larger population (Agnew & Flin, 2014; Frumenti & Kurtz, 2014; Hagen & Park, 2013; May, Huff & Goldring, 2012; Savvides & Pashiardis, 2016; Sebastian & Allensworth, 2012; Walker, Lee & Bryant, 2014; Wong & Giallonardo, 2013). Therefore, this study used a conceptual framework that is used in

current research (Adams, Djukic, Gregas & Fryer, 2018) and is designed as a precursor to a larger study to include a random sample.

Subjects. Subjects across all studies included leaders, comprising nurse leaders, principals, and project managers. Each study included mediating personnel who complete the actions in order to affect outcomes: nurses, teachers, and project team members. In addition, each study included those who may display the outcome: patients and students. Four studies were conducted in the United States of America (Frumentti & Kurtz, 2014; Hagen & Park, 2013; May, Huff & Goldring, 2012; Sebastian & Allensworth, 2012). One study each was conducted in each of: Ontario, Canada (Wong & Giallonardo, 2013); Hong Kong, China (Walker, Lee & Bryant, 2014), Cork City, Ireland (Fealy et al., 2013); Stockholm, Sweden (Agnew & Flin, 2014), and Cyprus (Savvides & Pashiardis, 2016).

Measurement instruments. The quantitative studies used varied instruments, including surveys, questionnaires, outcome data from surveys, and big-data sources (Agnew & Flin, 2014; Frumentti & Kurtz, 2014; Hagen & Park, 2013; May, Huff & Goldring, 2012; Savvides & Pashiardis, 2016; Sebastian & Allensworth, 2012; Walker, Lee & Bryant, 2014; Wong & Giallonardo, 2013). There was no congruence among instruments other than the practice of using previously tested instruments, or adaptations of previously tested instruments, to gather data in six studies (Agnew & Flin, 2014; Frumentti & Kurtz, 2014; Hagen & Park, 2013; Savvides & Pashiardis, 2016; Sebastian & Allensworth, 2012; Wong & Giallonardo, 2013). Fealy et al. (2013) used a qualitative design with focus groups and individual interviews. Although Fealy et al. (2013) also referenced use of questionnaires and other measurement instruments as data collection tools, the study results appeared exclusively to include information from focus groups and individual interviews. Agnew and Flin's (2014) mixed-method design used semi-structured

interviews with a convenience sample, which appeared phenomenological in nature, and then used interview results to create a survey for correlational analysis. Therefore, this study used the Leadership Influence over Professional Practice Environments Scale (LIPPES), which was previously tested and is in current use in similar research occurring in non-rural environments (Adams, Djukic, Gregas & Fryer, 2018).

Reliability and validity. Reliability and validity were comprehensively addressed in six of the studies (Agnew & Flin, 2014; Hagen & Park, 2013; Savvides & Pashiardis, 2016; Sebastian & Allensworth, 2012; Walker, Lee & Bryant, 2014; Wong & Giallonardo, 2013). In general, factor analysis was completed and Cronbach's alphas were calculated to confirm reliability. Fealy et. al. (2013) used a multistage process of qualitative data analysis, including identification of categories and emergent themes. This process was not extensively defined, which limits ability to confirm rigor, including credibility, dependability, confirmability and transferability (Streubert and Carpenter, 2011). Therefore, this study ensured the use of a data collection tool, the Leadership Influence over Professional Practice Environments Scale, which had been tested for reliability and validity using factor analysis (Adams, Nikolaev, Ives Erickson, Ditomassi, and Joes, 2013).

Risk of bias. Four of the studies addressed risk of bias (Agnew & Flin, 2014; Hagen & Park, 2013; Sebastian & Allensworth, 2012; Wong & Giallonardo, 2013). Each of these risks related to the use of perceptions as a component of measurement. These risks of bias are important to note between the studies, as future research should address the risks in order to add power to the state of the science. In essence, rather than measure perceptions of end outcomes or perceptions of leaders, risk of bias may be managed by using reliable and valid objective tools to measure actual, rather than perceived, outcomes and leadership characteristics (Wong &

Giallonardo, 2013). Therefore, this study examined aggregate patient-generated Consumer Assessments of Healthcare Providers and Systems Hospital data regarding patient perception of nurse communication, objectively gathered nationally standardized data regarding Emergency Department Transfer Communications, and compared these data to the Leadership Influence over Professional Practice Environments Scale data. By using standardized and tested tools for data collection, the risk of bias in the data was minimized.

Analysis. Analysis methods varied across fields. The studies in the nursing field used descriptive methods to analyze the quantitative data (Agnew & Flin, 2014; Frumenti & Kurtz, 2014; Wong & Giallonardo, 2013), and found emerging themes in the qualitative studies (Agnew & Flin, 2014; Fealy et al., 2013). In education field studies, two studies used multilevel structural equation modeling (Savvides & Pashiardis, 2016; Sebastian & Allensworth, 2012); another used three-level hierarchical linear modeling (May, Huff & Goldring, 2012); and the fourth used classification and regression tree (CART) analysis (Walker, Lee & Bryant, 2014). The study conducted in the business field used regression analysis to find a curvilinear relationship (Hagen & Park, 2013). Therefore, this study used a comparison of means to identify, and then estimate the size of, significant relationships among the quantitative data.

Leadership measures. The leadership characteristics that were measured varied across studies and fields. In the business field, the study used ambiguity acceptance and open communication as measures of leadership qualities of project managers (Hagen & Park, 2013). In the field of nursing, the studies trended toward measuring style-based leadership characteristics, such as authentic leadership (Wong & Giallonardo, 2013); transformational leadership (Frumenti & Kurtz, 2014); and, characteristics of “self-awareness, advocacy and empowerment, decision-making, communication, quality and safety, teamwork and clinical

excellence” (Fealy et al., 2013, p. 326). In the field of education, studies measured multiple behavior-based characteristics of educational leaders with some style-based elements. This study used the Leadership Influence over Professional Practice Environments Scale to measure both behavioral and style-based leadership characteristics, in order to enable the results to be compared to current or future study findings in other settings in which the Leadership Influence over Professional Practice Environments Scale was used.

Significant and non-significant results. Each study showed significant results in leadership characteristics affecting outcomes. However, each study included mediating factors that, in accordance with the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives used in this study, played a role in affecting outcomes. These mediators included the project team members (business field), the front-line nurses (nursing field), and the staff, teachers or aspects of the learning climate (education field).

Significant results. In Hagen and Park’s (2013) study in the business field, both open communications and ambiguity acceptance by the project managers were associated with increased positive outcomes. Team-leader open communication related to better outcomes along with the team member (mediator) also using open communications.

In the nursing studies, positive outcomes were associated with authentic leadership, executive coaching, prioritizing communications, and leadership development of front-line personnel (Agnew & Flin, 2014; Fealy et al., 2013; Frumenti & Kurtz, 2014; Wong & Giallonardo, 2013). Each of these studies included mediators between the leader and outcomes. Authentic leadership affected trust and areas of work life, which, in turn, affected patient outcomes (Wong & Giallonardo, 2013). Executive coaching was used to teach patient care managers’ transformational leadership qualities that were related to communications and quality

improvement skills, and which then lowered rates of hospital acquired pressure ulcers (Frument & Kurtz, 2014). Similarly, Fealy et al. (2013) found that leadership development was positively associated with improved quality and safety via the front-line staff.

In the educational field, the behaviors of the principal had more focus than leadership styles. However, mediating factors were also present in each study, again showing an indirect relationship of principal leadership to student achievement (May, Huff & Goldring, 2012; Sebastian & Allensworth, 2012; and, Walker, Lee & Bryant, 2014). Walker, Lee, and Bryant (2014) found that positive association with using communication structures, such as timely information, reasonable number of meetings, effective and efficient meetings, and keeping colleagues informed, created a shared vision. This shared vision was the mediator for improved student achievement. May, Huff and Goldring (2012) found that time spent on finance and personnel issues was related to improved achievement, and lower student achievement was associated with more time spent on instructional leadership and planning/setting goals. May, Huff and Goldring (2012) suggested the presence of mediating factors of school climate, including trust and “focus on academic excellence and professional and academic standards” (p.434). The elements of trust and promotion of excellence were echoed in Sebastian and Allensworth’s (2012) study of the perception of principals’ leadership abilities, specifically instructional leadership and creating a trusting relationship with teachers, as compared to student achievement. With learning climate as a mediator, a significant positive relationship was found, across 99 schools, between principal leadership and student achievement (Sebastian & Allensworth, 2012).

Sebastian and Allensworth (2012) and May, Huff and Goldring (2012) identified direct positive relationships of principal leadership to student achievement, in addition to the indirect

relationships found in theirs and others' studies. Yet, both studies support further work to explore direct and indirect relationships of educational leadership to student outcomes.

Non-significant results. Non-significant results continue to inform the knowledge base. Although a relationship of school leadership was not significantly directly or indirectly related to student achievement in Savvides and Pashiardis' (2016) study, school leadership was directly related to academic optimism, which was considered a mediating factor for student success. Savvides and Pashiardis (2016) suggest various reasons for the non-significant results, including the priority placed on the specific aspect of student achievement being studied, and the statistical power of the sample size.

Causality. All studies in this review either did not infer causality or cautioned against such an inference. May, Huff and Goldring (2012, p.433) state, "we believe the more plausible causal relationship is that school context drives principal's activities" as they highlight the possibility of the reciprocal effect of outcomes affecting leadership. Causality also was not inferred in this study.

Discussion and recommendations. The studies in this review each include a mediating factor related to climate, or the professional practice work environment (PPWE) (Agnew & Flin, 2014; Fealy et al., 2013; Frumenti & Kurtz, 2014; Hagen & Park, 2013; May, Huff & Goldring, 2012; Savvides & Pashiardis, 2016; Sebastian & Allensworth, 2012; Walker, Lee & Bryant, 2014; Wong & Giallonardo, 2013). The studies highlighted, in different ways, how leadership authenticity, transformational leadership practices, effective communications, and creating an expectation of excellence related to the overall climate of the institution. The climate mediated the leadership effects, with an improved climate contributing to positive outcomes.

Several leadership characteristics positively affected outcomes across studies. Ability to communicate effectively, develop trust, and build collaborative relationships was identified as a group of significant leadership characteristics related to positive outcomes in seven studies across all identified professional fields (Agnew & Flin, 2014; Fealy et al., 2013; Frumenti & Kurtz, 2014; Hagen & Park, 2013; Sebastian & Allensworth, 2012; Walker, Lee & Bryant, 2014; Wong & Giallonardo, 2013). Creating an expectation of excellence was an effective positive leadership characteristic in six studies across nursing and education (Agnew & Flin, 2014; Fealy et al., 2013; Frumenti & Kurtz, 2014; Sebastian & Allensworth, 2012; Walker, Lee & Bryant, 2014; Wong & Giallonardo, 2013).

All studies in this review identified mediating factors as affecting the relationship between leadership and outcomes. These mediating factors included trust, areas of work life, shared vision, cultural (learning) climate, safety, and professional expectations of excellence and quality. Each of these factors also may be included in the professional practice work environment, which is consistent with the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives used in this study (Figure 2) (Adams, Erickson, Jones & Paulo, 2009).

Limitations. Several limitations were identified across studies. Longitudinal studies were recommended to improve ability to infer causality and improve generalizability (May, Huff & Goldring, 2012; Sebastian & Allensworth, 2012; Wong & Giallonardo, 2013). Studies using larger sample sizes and greater variability of settings were recommended in order to improve statistical power and generalizability (Agnew & Flin, 2014; Savvides & Pashiardis, 2016; Sebastian & Allensworth, 2012; Walker, Lee & Bryant, 2014). Others cautioned that confounding variables, such as socioeconomic status, institutional contextual factors, and

cultural environmental factors, should be taken into account in future studies to enhance findings (Hagen & Park, 2013; Savvides & Pashiardis, 2016; Walker, Lee & Bryant, 2014). Taking these limitations into account, this study is designed to facilitate a future comparative study with a larger sample size, which will enable generalizability to a large population.

Summary of Literature Review

In general, the review of the literature is consistent with the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives model (Figure 2) (Adams, Erickson, Jones & Paulo, 2009). The studies revealed how leadership characteristics affect mediating factors, which then affect outcomes. One study proposed the reciprocal relationship of outcomes affecting leadership characteristics, which is also inherent in the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives.

Notable Ongoing Research

Notable research is currently proceeding in the field of nursing leadership affecting patient outcomes. The development of the Leadership Influence Self-Assessment (LISA©) instrument is underway in a metro-area hospital in the United States (Shillam, Adams, Chatman Bryant, Deupree, Miyamoto & Gregas, 2018). This first analysis of the LISA© instrument is showing positive results for future use. Further study is being done to relate nursing leadership traits in the LISA© with patient outcome changes. Further work is also needed in rural settings.

During completion of data collection for this study, a new study was found that was related to this research. Adams, Djukic, Gregas and Fryer (2018) conducted a study of 778 nurse leaders in thirty-five academic and community hospitals located in eight states: Connecticut, Florida, Maine, Massachusetts, New Hampshire, New York, North Carolina, and Texas. There

was no mention of any rural location of hospitals included in this study (Adams, Djukic, Gregas, & Fryer, 2018). The researchers used the Leadership Influence of Professional Practice Environments Scale to measure nursing leadership influence characteristics and compare those to nurse-sensitive patient outcomes of: “rate of falls with injury, hospital-acquired pressure ulcers (HAPU) \geq state 2, central line-associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI)” (p.261) and the Hospital Consumer Assessment of Healthcare Providers and Systems scores for “RN communications, MD communications, staff responsiveness, room cleanliness, and noise” (p. 261). The results of this cross-sectional correlational survey study are interesting in that this was the first large-scale study to use the Leadership Influence over Professional Practice Environments Scale to compare nursing leadership influence characteristics directly to patient outcomes (Adams, Djukic, Gregas, & Fryer, 2018). Results showed seventeen significant relationships, including two that used similar measures to this study: overall nurse communication on the Hospital Consumer Assessment of Healthcare Providers and Systems was significantly related to leadership expectations of staff and nurse leader authority (Adams, Djukic, Gregas & Fryer, 2018). Therefore, this study will use the Leadership Influence over Professional Practice Environments Scale and will assess the Hospital Consumer Assessment of Healthcare Providers and Systems scores for nurse communications in order to enable an evaluation across studies conducted in rural versus academic and community hospital environments.

Theoretical Foundation

This research study uses the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives (Figure 2) as a framework. However, the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives is based on

the Adams Influence Model (AIM) theoretical model as the theoretical underpinnings of the work (Adams, Ives Erickson, Jones & DePaulo, 2009). In short, the Adams Influence Model theorizes how influence is created, and the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives describes what influence does (J.M. Adams, personal communication, October 6, 2017). Because the relationship between the theoretical model and the framework is tied to understanding how nursing leaders may influence patient outcomes, it is important to understand the Adams Influence Model, its creation, and how it relates to the practice of nursing leadership as modeled in the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives. The Adams Influence Model theoretical model will be explained and evaluated using Parse's structure and process criteria for nursing theory evaluation, including structure criteria of historical evolution, foundational elements, and relational statement of the theory and process criteria of semantic integrity, simplicity, syntax, aesthetics, effectiveness and heuristic potential (Parse, 2005).

Structure Criteria. The Adams Influence Model was initially created in 2003, in an effort to understand how female nurse executives influenced selection of clinical information systems using social power and directional influence (Adams & Natarajan, 2016). The Adams Influence Model was piloted and changed, and further feedback was sought, resulting in revisions of the model to visually simplify it; break down influence into styles, tactics and attributes; and incorporate "Newman's Theory of Health as an Expanding Consciousness, Roy's Adaptation Model, and King's Interacting Systems Framework and Theory of Goal Attainment" (Adams & Natarajan, 2016, pp. E44-E46). Adams linked the adaptive and changing nature of influence to Newman and Roy's theories, and linked King's theories via assumptions of interdependence and interactivity amongst personal, social, and interpersonal systems as the three major rings of the

Adams Influence Model itself (Adams & Natarajan, 2016). Adams & Natarajan (2016) provide a crosswalk of King's (1981) concepts matched to concepts within the Adams Influence Model, showing how deeply King's work influenced development of the Adams Influence Model. The final iterations of the Adams Influence Model bring the model from a flowchart design to the camera shutter design, with influence depicted as the focus for one moment in time, as influence is considered adaptive and ever-changing (Adams & Natarajan, 2016). The philosophical assumptions and underpinnings of the Adams Influence Model are situated in Newman, Roy, and King's work. The major concepts are explicated including the concept of influence as a snapshot in time, occurring between two entities of the agent and target, and incorporating five factors of knowledge-based competence, authority, status, communication traits, and time and timing, all interacting within social, interpersonal and personal systems (Adams & Natarajan, 2016). Although not defined in the model, the Adams Influence Model elements fit within Parse's Theory of Human Becoming, as influence is conceptualized as ever-changing with the universe, requiring a choice to be made rather than coerced (Parse, 2014).

Adams & Natarajan (2016) relate the principles of the Adams Influence Model back to practice, citing centrality of patient care in nursing leadership practice, and the requirement for nurse leaders to understand how care is influenced through use of concepts, language and styles.

Process Criteria. The assumptions, concepts and principles in the Adams Influence Model are generally clearly defined and flow from assumption through principle with efficiency and unambiguity. Each influence factor has clear operational definition correlated with well-defined attributes of influence from the literature (Adams & Natarajan, 2016). Aesthetics of the Adams Influence Model were purposely improved over five iterations, resulting in symmetrical and straightforward illustration of the complexity of influence. However, although Adams &

Natarajan (2016) discuss differentiation of power and influence in relation to the Adams Influence Model, this is not visualized in the model.

The Adams Influence Model was evaluated in 2006 using qualitative content analysis of responses to the Revised Professional Practice Environment Scale. Each influence factor or attributes was represented in the content analysis, supporting the inclusion of these factors in the Adams Influence Model (Adams & Natarajan, 2016). The Adams Influence Model was used as a basis to create the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives (MILE ONE) (Figure 2) (Adams, Ives Erickson, Jones & DePaulo, 2009), which served as the model for a group of national nursing experts to discuss the mechanisms by which nursing leadership influences outcomes (Batcheller, Zimmerman, Pappas & Adams, 2017).

Theoretical Statements

The Adams Influence Model makes several existential and relational theoretical statements. These include King's (1981) social, interpersonal and personal systems permeating all aspects of influence agent and target interactions. Influence is a snapshot in time, requiring adaptation to feedback and differences in issues. The Adams Influence Model posits that five factors of knowledge-based competence, authority, status, communication traits, and time and timing are inherent for both the influence agent and target. Moreover, the Adams Influence Model theorizes that influence is affected by perceptions of the target and agent, with these perceptions modified by influence tactics and target feedback (Adams & Natarajan, 2016).

The statement regarding the pervasive nature of the social, interpersonal and personal systems as a basis of influence includes concepts from King's (1981) Theory of Goal Attainment (TGA). Adams & Natarajan (2016) cite a personal communication with Imogene King to match

the Theory of Goal Attainment concepts directly to the Adams Influence Model concepts. These concepts correlate appropriately with the need for nursing leaders to attain patient care goals by influencing others. The concepts from the Theory of Goal Attainment are each a piece of social, interpersonal and personal systems (King, 1981), which have a unique role when working with rural populations. In particular, Long & Weinert's (1989) theory of rural nursing includes the key concepts related to these systems: work beliefs and health beliefs (personal), isolation and distance (personal), self-reliance (personal), lack of anonymity (interpersonal), outsider/insider (social), and old timer/newcomer (social). With key concepts of rural theory relating to the theoretical underpinnings of the Adams Influence Model, the need for research on influence within rural settings is essential and ethically necessary to develop the evidence base for rural nursing leaders' practice.

The theoretical statement of influence as a snapshot in time, requiring adaptation to feedback and differences in issues, includes assumptions that nursing leaders are able to adapt and should respond differently. Leadership teachings sometimes promote consistency in interactions and processes as a hallmark of great nursing leadership (Studer, 2009). Yet, other leadership teachings hold individualization and strength-based leadership as key (Rath & Conche, 2009). Further, a leader using a different influential style or technique with one person as opposed to another may be viewed as inequitable. However, the interpersonal nature of influence appears to demand an individualized approach to different situations, holding fairness as an ethical imperative to improve equity. In the rural population, the concept of adaptation fits with Long and Weinert's (1989) key concepts of self-reliance and independence in the rural population. Rural residents adapt to health concerns in remaining self-reliant (Warren & Smalley, 2014). In a similar fashion, a nursing leader would be expected to adapt to different

situations, including using varied qualities to create influence as situations demand.

Summary

Healthcare in the unique rural setting requires different approaches than in metropolitan areas of the United States. The literature supports the concept of nursing leaders having the ability to influence positive outcomes in rural communities by situating the concept within the theoretical foundation of the Adams Influence Model and a conceptual framework of the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives. However, there is no currently identified research conducted solely in rural areas that identifies methods by which nursing leaders create influence to result in positive outcomes. This research study is the beginning of a program of research designed to address this knowledge gap and contribute to the state of the science in order to improve the health of rural populations.

CHAPTER 3

RESEARCH METHOD

The purpose of this study was to examine nurse leader influence and nurse-sensitive outcome scores in critical access hospitals. The specific aims for this dissertation study were to:

1. Determine demographics, nurse-leader influence scores, and nurse-sensitive outcome scores in critical access hospitals in the United States.
2. Analyze for differences in nurse leader influence scores in critical access hospitals in North Dakota and in critical access hospitals in other states.
3. Analyze for differences in nurse-sensitive outcome scores of nurse leaders in critical access hospitals in North Dakota and critical access hospitals in other states.

This chapter details the research strategy, methodology, and analysis. It will describe the studied population, instruments used to collect data, and methods used to analyze the data.

Research Design

This study is a comparative design examining differences between findings in North Dakota as compared to other states in regards to characteristics of leader influence and nursing-sensitive outcomes of nurse-generated information in emergency department transfer communications, and patient satisfaction reports of patients who reported that their nurses "Always" communicated well. This study uses a problem-based approach to nursing research (Ellis and Levy, 2008; Risjord, 2010). This approach studies a complex defined problem; in this case, the disparity between patient outcomes in rural settings as compared to metropolitan settings, with the solution sought in studying the differences between different geographical area measurements of nursing leadership influence and patient outcomes.

Sample and Setting. Nursing leaders at all thirty-six critical access hospitals in North Dakota were contacted directly via emails, which are available with permission from the Center for Rural Health at the University of North Dakota. All critical access hospitals in North Dakota are in rural areas of the state. In this case, the entire population of critical access hospital nursing leaders in North Dakota was surveyed. Discussions with the Center for Rural Health, which works closely with this population, revealed that most nursing leaders would be female Caucasians of various ages and with various lengths of service both in the role and within the critical access hospital. It was understood that this population would be quite willing to assist in the research, but that some might be quite busy and/or might have difficulty with the length of the survey, compounded by the need to find data to input into the survey. For this reason, the Center for Rural Health offered to assist in creating connections with the population of critical access hospital nursing leaders and endorsed the research study to the group. As well, the Center for Rural Health offered to provide data back to each critical access hospital nursing leader, at their request, for input into the survey, in order to make it easier for each leader to participate in the research study. The Center for Rural Health also advised both emailing and calling each nursing leader to encourage participation, yet to also beware of calling or emailing too frequently so as not to overload this quite accommodating group of nursing leaders with requests to participate. In total, out of the 36 critical access hospitals in North Dakota, there were 28 participants in this study.

The Center for Rural Health advised contacting the Flex Program Coordinators in other states for assistance in surveying critical access hospital nursing leaders in all forty-five participating programs. The Medicare Rural Hospital Flexibility (Flex) programs are able to apply for federal funding “for the creation of rural health networks, promotes regionalization of

rural health services and improves access to hospitals and other services for rural residents” (National Rural Health Resource Center, 2019). Flex Program Coordinators were contacted via email at each of the forty-four Flex Programs in forty-four states outside of North Dakota. Nineteen Flex Program Coordinators volunteered to send the survey information to the critical access hospital nursing leaders in their states. However, the availability of nurse leader contact information varied from state to state. Some coordinators had lists of contact information readily available, while others had partial lists or none available for the nursing leaders specifically. In total, eighteen Flex Program Coordinators volunteered to send the survey to the critical access hospital nursing leaders in their states with there being a maximum of 564 critical access hospitals in those states. Including the 36 critical access hospitals in North Dakota, up to 600 critical access hospital nursing leaders were contacted to participate in this study. This represents 44.1% of the 1361 critical access hospitals across the 45 states. Because of the scope of this sampling, the leaders were contacted by email and were asked to supply their outcome data directly into the survey. It was anticipated that there would be a lower rate of response, as compared to North Dakota, due to these data collection differences. In total, out of the 564 critical access hospital nurse leaders contact for this study outside of North Dakota, there were 44 participants included in the study.

Eligibility. Critical access hospital nursing leaders who are registered nurses who identify responsibility for nursing practice at the critical access hospital were included. Usually, these nursing leaders held the title of Director of Nursing, Chief Nursing Officer and were in charge of nursing practice quality. Although an exclusion criterion of being in the role for a minimum of two years was considered to allow the nursing leader time to influence studied outcomes and retrieve data potentially affected by that particular nursing leader, this was not

ultimately chosen as an exclusion criterion. Instead, this factor was considered in the analysis and reporting of the data.

The critical access hospital environment was chosen for several reasons. Critical access hospitals are funded on a cost-based model rather than the case-based model for non-critical access hospital rural hospitals (Newhouse, Morlock, Pronovost & Sproat, 2011), making comparison generally among the two types of rural hospitals problematic. Critical access hospitals are more precisely defined within rural settings (Warren & Smalley, 2014), allowing for a more robust comparison across facilities. For instance, critical access hospitals must have 25 or fewer acute care inpatient beds, be located more than 35 miles from another hospital (with few exceptions, such as in mountainous areas), have an annual average acute care length of stay of 96 hours or less, and offer 24/7 emergency care services. Although hospitals in rural locations include critical access hospitals, they also include hospitals without the critical access hospital designation. Such hospitals have funding models on a case-based, rather than cost-based, model. They may also not have 24/7 emergency care and may have longer lengths of stay. By choosing the critical access hospital environment to assess nurse leader influence and outcomes, the more precise definition across the country allows for more reliable comparisons.

Ethical Procedures. Permission to conduct this study was sought from the University of North Dakota Institutional Review Board (IRB). The IRB-required human subjects' education was completed by the principal investigator, including education on ethical research and protection of human subjects.

Subjects were emailed a link to the survey, entitled the Leadership Inventory Survey. This email was sent to email addresses supplied by the Center for Rural Health at the University of North Dakota, or by Flex Program Coordinators for states other than North Dakota. The

researcher did not have access to the specific identities of the participants apart from email addresses in three states. There was an informational page set as the first page of the survey to allow participants to be informed prior to continuing with the survey. This allowed participants to opt out before giving any information. No signed consent form was completed.

A ten-dollar gift card was offered as an incentive gift to be given automatically via Qualtrics at the completion of the survey for North Dakota participants. Due to lack of available ongoing funds, and the expansion of the participant pool, a drawing for a \$50 incentive gift card was offered to participants from other states. The incentive gifts and the differences in incentives among groups was approved by the University of North Dakota Institutional Review Board.

Treatment of Data. Data was to be stored for a minimum of three years after data analysis is complete, or for a time sufficient to meet federal, state, and local regulations, and organizational policies and procedures. All survey data collected was anonymous. However, because some answers to demographic questions may give enough information that a participant could be identified, all reporting was in aggregate form. In order to protect the identity of the participants, no outliers were found in the reporting. Data was collected using a Qualtrics survey through the University of North Dakota's Qualtrics account. Further data were stored on a password-protected account on a secure server.

In-kind support was received from the Center for Rural Health and from Flex Program Coordinators in finding contact information for the nursing leaders, and in promoting the research study to the nursing leaders. There are no conflicts of interest in relation to sponsorship.

Power Analysis

To ensure validity of the results of this study, a statistical power of 0.80 was desired in congruence with recommendations of Cohen (1988). The sampling included participants from

multiple other states as well as North Dakota, and included a comparative study design. The data from the North Dakota sample were compared to data from all other participating states to determine differences and the effect sizes of significant differences. An a priori power analysis was completed using G*Power 3.1.9.4, a large effect size (d) of 0.80, alpha .05, and a power of 0.80. With these parameters, the total sample size must be 52 with an even distribution of 26 participants in each group. Potential response rates for other states were unknown due to variability in contact information and robustness of leadership networks across each state. Although general national and state ethnicity, age, and race data were available, these data were not available for the population of critical access hospital nursing leaders across the country.

Data Collection

The survey was set up using the Qualtrics platform to input all survey questions, including demographical questions, input areas for Hospital Consumer Assessment of Healthcare Providers and Systems and Emergency Department Transfer Communication data, and Leadership Influence over Professional Practice Environments Scale survey questions. The survey was named the “Leadership Inventory Survey” and began with an informed consent statement to allow participants to be informed about the study purpose, procedures, risks, benefits, duration, confidentiality, right to ask questions, compensation, and voluntary participation. All questions on the survey were set up to allow participants to skip questions as they wished and still move forward in the survey. Each nursing leader was emailed a confidential link to the survey to allow for participation. This link was embedded as a hyperlink in each email sent to the leader, in order to allow the nursing leader to click the hyperlink and be automatically directed to the web-based survey. Upon completion of the survey, an automated thank-you

message was generated to each completer, and the option for an incentive gift opportunity was provided by the researcher, and not from any external funding agency.

The Leadership Inventory Survey has not been used in past studies as a whole. However, the Leadership Influence over Professional Practice Environments Scale was embedded in its entirety within the Leadership Inventory Survey. This scale has been used in past research by Adams, Djukic, Gregas and Fryer (2018), and Adams, Nikolaev, Ives Erickson, Ditomassi, and Jones (2013).

The web-based survey link was emailed to nurse leaders at all critical access hospitals in North Dakota and in twenty other participating states. Emails were sent initially, and three more times every two weeks (Dillman, Smyth & Christian, 2009), directly to the nursing leaders. The emails contained a description of the study, institutional review board approval, an electronic link to the agreement for participation and informed consent, and an electronic link to the web-based Leadership Influence over Professional Practice Environments Scale survey tool and demographic data input tool. The result of this strategy was a self-randomized probability sample of critical access hospital nursing leaders (Polit & Beck, 2012). In discussion with the Center for Rural Health, they described that it is possible to achieve a one-hundred percent response rate for the population in North Dakota, based on past experiences with this group of nursing leaders (J. Ward, personal communication, April 20, 2018). Potential response rates for other states were unknown due to variability in contact information and robustness of leadership networks across each state.

Email-based distribution of the survey is a valid and cost-effective method for gathering responses, especially over a wide geographic area such as for critical access hospitals (Polit & Beck, 2012). A small incentive gift has been shown to significantly improve response rates

(Dillman, Smyth & Christian, 2009; Zhang, Lonn & Teasley, 2017), so each participant in North Dakota was offered a \$10 gift card or, for those in other states, to be put into a drawing for a \$50 gift card upon completion of the survey. This incentive difference was approved by the University of North Dakota Institutional Review Board. Reminder emails, sent in two-week intervals to non-responders as permitted by Flex Program Coordinators, for a maximum of 6 weeks (a total of four emails), were designed to enhance response rates (Aerny-Perreten, Dominguez-Bergon, Estaban-Vasallo & Garcia-Riolobos, 2015; Dillman, Smyth & Christian, 2009). Four weeks into the survey timeframe in North Dakota, however, it was noted that response rates were low, with only four respondents during this four-week timeframe. Therefore, the Center for Rural Health suggested contacting potential participants in North Dakota by phone. The Institutional Review Board approved a revision of the study protocol and phone calls were made to each potential participant using an approved template for the phone conversation. A total of up to two phone calls were made in two-week intervals to each potential participant in North Dakota in addition to the four emails. Although the sample size from the other states was required to be 26 to provide a balanced sample with the 26 from North Dakota, there were 44 participants in total from other states as Flex Program Coordinators connected with the nursing leaders. All were recruited in the same manner, with some completing the survey earlier than others as program coordinators got the messages out. The higher number of participants were included in the study to allow for more broad representation across states and to honor the input from these leaders.

The Center for Medicare and Medicaid Services (CMS) requests critical access hospitals report Hospital Consumer Assessment of Healthcare Providers and Systems data as a measure of quality (CMS, 2017a). Because funding for critical access hospitals is not based on such

reimbursement calculations, reporting of these data is not a financial requirement. However, voluntary critical access hospital reporting of Hospital Consumer Assessment of Healthcare Providers and Systems data has been increasing, with 35.4% reporting in 2009, up to 75.8% in 2015 (Casey, Swenson & Evenson, 2017). Unfortunately, the publicly available data is often suppressed due to small reporting numbers at these hospitals. Due to difficulties in obtaining this information from public reports, fields to fill in these data were added to the electronic surveys sent to nursing leaders, with a request for them to fill in the data and send it directly to the researcher.

The North Dakota Critical Access Hospital Quality Network (Center for Rural Health, 2018) is an organization dedicated to helping critical access hospitals in North Dakota in their quality improvement efforts. The organization is administered through the Center for Rural Health at the University of North Dakota (Center for Rural Health, 2018). It collects, analyzes, and shares data in support of quality improvement across North Dakota for all rural hospitals. Flex programs in other states offer similar services. The collected data include Emergency Department Transfer Communication (EDTC) and Hospital Consumer Assessment of Healthcare Providers and Systems data. This prompts every critical access hospital in North Dakota and many other states to collect these data elements as part of the Quality Network, even though funding is not based on collection of these data elements. Therefore, Emergency Department Transfer Communication and Hospital Consumer Assessment of Healthcare Providers and Systems are common data points that may be compared across critical access hospitals in North Dakota and other participating states. Of note is that not all state flex programs store this information for the critical access hospitals, which may have had an effect on participation rates from those states in this study.

Instrumentation and Operationalization of Constructs

Three published instruments are used for data collection in this research study: 1) a demographic survey, 2) the Leadership Influence over Professional Practice Environments Scale (LIPPES), and 3) the Consumer Assessments of Healthcare Providers and Systems Hospital Survey (HCAHPS), and Emergency Department Transfer Communications (EDTC) instruments. The following sections provide detail about each instrument.

Demographic Information. Demographic information was collected from each participant for descriptive and comparative purposes in this study. The demographics to be collected, along with rationale for their collection, are summarized in Table 1.

Table 1. Rationale for Collection of Demographic Information

Item	Rationale for Collection
Year of Birth	Age may be a confounding factor especially in relation to leadership influence factors.
Gender	May be a confounding factor.
Level of Education	May be a confounding factor as level of education could affect ability to create influence.
Race	May be a confounding factor.
State	Required factor for comparative analysis.
Length of Time in Current Position	This may be a confounding factor as the leader may have a different level of influence depending on time within the specific leadership position.
Length of Time at This Critical Access Hospital	As a member of the hospital staff, perhaps in different roles than their current leadership role, the individual may have a different level of influence than someone newer to the hospital itself.
Length of Time in the Community	Critical access hospitalss are small rural facilities serving a small but widespread population. A nursing leader living within the community for a lengthy period of time may have a different level of influence compared to someone who may be considered an “outsider” to the community (Long & Weinert, 1989).
Grew Up in Community	As with length of time in the community, someone who has grown up within the community may have a different level of influence as an “insider” compared

to someone who moved to the area later in life (Long & Weinert, 1989).

Leadership Influence over Professional Practice Environments Scale (LIPPES). This research was conducted by analyzing data from critical access hospital (CAH) nursing leaders' perceptions of their influence, as measured by the Leadership Influence over Professional Practice Environments Scale (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013) nurse-sensitive outcomes data, and a comparison of these data between North Dakota and twenty other participating states. The Leadership Influence over Professional Practice Environments Scale is a 59-item scale with six subscales: collegial administrative approach, internal strategy and resolve, authority, access to resources, leadership expectations, and status (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013). This scale was developed by combining the theoretical bases of the Adams Influence Model (Adams & Natarajan, 2016) and the Revised Professional Practice Environment scale (Ives Erickson, Duffy, Ditomassi & Jones, 2009) to incorporate the concepts of influence of the nursing leader (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013), consistent with the MILE ONE framework. The Leadership Influence over Professional Practice Environments Scale was originally piloted with a convenience sample of 150 attendees at an Institute for Nursing Healthcare Leadership conference, participants who were in leadership roles in nursing, patient care administration, and nursing educational roles (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013). The results were assessed for psychometric soundness, including principle component analysis (PCA) factor loading of each item (and Cronbach's alpha ($\alpha = .893$ to $.968$ across the overall score and subscales) for the total Leadership Influence over Professional Practice Environments Scale and each subscale (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013). The Leadership Influence over Professional Practice Environments

Scale is in use in current and future nursing leadership research in relation to improving patient outcomes (Adams, Djukic, Gregas & Fryer, 2018; Ducharme, Bernhardt, Padula and Adams, 2017; Melnyk, Hrabe & Buck, 2015; Somerville, Reid Ponte, Pipe and Adams, 2015). In particular, a large study of 778 nursing leaders across 35 academic and community hospitals in eight states in the United States used the Leadership Influence over Professional Practice Environments Scale to assess nursing leadership characteristics in relation to patient outcomes data for “rate of falls with injury, hospital-acquired pressure ulcers (HAPU) \geq stage 2, central line-associated bloodstream infections (CLABSI), and catheter-associated urinary tract infections (CAUTI)” (Adams, Djukic, Gregas & Fryer, 2018, p. 261). Nursing leaders in this sample included registered nurses with primary responsibility for inpatient nursing care in the hospital. Results of this study showed significant relationships among five of the six leadership characteristics identified in the Leadership Influence over Professional Practice Environments Scale to patient outcomes as described above (Adams, Djukic, Gregas & Fryer, 2018).

Each item on the Leadership Influence over Professional Practice Environments Scale is scored on a 4-point Likert-type scale, ranging through an ordinal scale of possible responses: (1) Never, (2) Sometimes, (3) Often, and (4) Always. As there are high PCA-loading factors for the six subscales and the overall Leadership Influence over Professional Practice Environments Scale score, as compared to greater variation in PCA-loading factors for individual scale items (Adams & Natarajan, 2016), the independent variables for this study were the overall Leadership Influence over Professional Practice Environments Scale influence score and the six subscales of the Leadership Influence over Professional Practice Environments Scale. Each of these independent variables are ordinal with no cut points. Higher scores indicate positive leadership trait results.

Permission to use the Leadership Influence over Professional Practice Environments Scale is found in Appendix C. Although permission was obtained from author Dr. Jeffrey Adams to use the instrument, the author of the instrument requests that readers wishing to access further details, including questions and groupings of questions, contact him directly. More information about the Leadership Influence over Professional Practice Environments Scale, including reliability and validity values, PCA loading factors and Cronbach's alpha values, is located in the published work by Adams & Natarajan (2016).

Consumer Assessments of Healthcare Providers and Systems Hospital Survey (HCAHPS). The Hospital Consumer Assessment of Healthcare Providers and Systems survey instrument (Stratis Health, 2017) was developed using extensive testing from 2002 to 2006, prior to broad implementation in 2008 (Giordano, Elliott, Goldstein, Lehrman, & Spencer, 2010). The survey is endorsed by the National Quality Forum (NQF) and was developed through a joint effort of the Agency for Healthcare Research and Quality (AHRQ) and the Centers for Medicare and Medicaid Services (CMS) as a method of obtaining standardized data, creating a reporting structure for that data, and implementing quality improvement initiatives (Giordano, Elliott, Goldstein, Lehrman, & Spencer, 2010; Hurtado, Angeles, Blahut and Hays, 2005). The development of the survey tool included “a public call for measures; literature review; cognitive interviews; consumer focus groups; stakeholder input; a three-state pilot test; extensive psychometric analyses; consumer testing; and numerous small-scale field tests” (Hospital Consumer Assessment of Healthcare Providers and Systems, 2018, p.1). Cognitive testing was conducted from 2002-2003, which resulted in changes to the wording of items to account for patient understanding of the item and to ensure that the item was not too specific, which

otherwise hampered the ability of patients to answer the question (Levene, Fowler, & Brown, 2005).

The survey includes 32 items, 21 of which are designed to measure patient perceptions of quality care in seven composite or summary sections, consisting of two to three items in each composite (Hospital Consumer Assessment of Healthcare Providers and Systems, 2018). One of the composites is how well nurses communicate with patients, which consists of three items scored on a Likert-type scale of Never (1), Sometimes (2), Usually (3) and Always (4) (Hospital Consumer Assessment of Healthcare Providers and Systems®, 2018). These three items are:

1. During this hospital stay, how often did nurses treat you with courtesy and respect?
2. During this hospital stay, how often did nurses listen carefully to you?
3. During this hospital stay, how often did nurses explain things in a way you could understand?

These items, as well as the composite of these three items, have been found to have convergent validity in a study of two hospitals, with a total of 1030 adult medical, surgical, and obstetrical patients who had spent at least one night in the hospital completing the survey (Westbrook, Babakus & Grant, 2014). The study excluded minors under age 18 years, prisoners, patients discharged to hospice, patients used for publicity purposes, and patients with a foreign home address (Westbrook, Babakus & Grant, 2014). In this study, the average variance extracted for each item was greater than 0.50, indicating convergent validity. However, the study also found that discriminant validity of the items, requiring average variance extracted be larger than the shared variance, was not met in this situation (Westbrook, Babakus & Grant, 2014).

Nevertheless, the authors of the study acknowledge that reliability remained above the 0.70

benchmark, with alpha scores of 0.782 and 0.862 in each hospital studied for the composite of communication with nurses' items (Westbrook, Babakus & Grant, 2014).

Although the Hospital Consumer Assessment of Healthcare Providers and Systems is not required for reimbursement purposes for critical access hospitals (Hospital Consumer Assessment of Healthcare Providers and Systems, 2018), critical access hospitals in North Dakota all implement Hospital Consumer Assessment of Healthcare Providers and Systems for use with their statewide quality improvement initiatives (J. Ward, personal communication, April 20, 2018). In communications with Flex Program Coordinators across the United States, it was found that most other Flex programs also incorporate this data. The questions regarding nurse communication are nurse-sensitive indicators, meaning they are indicative of quality nursing practice rather than a mixture of different disciplines. Taking into account the validity, reliability, nurse-sensitive nature, and consistent use of these measures in critical access hospitals in North Dakota, the Hospital Consumer Assessment of Healthcare Providers and Systems scores for nurse communication are appropriate for use in this research.

Emergency Department Transfer Communications (EDTC). The importance of communication during patient transfer from emergency departments has been highlighted as a method to prevent adverse patient events (Klingner & Moscovice, 2012; Stratis Health, 2014). The Emergency Department Transfer Communication (EDTC) measures (Stratis Health, 2017) are a standard group of twenty-seven measures used by critical access hospitals to assess communication of patient information from a critical access hospital emergency department to the hospital where a patient has been transferred. These measures are grouped into seven categories, including six measures within the category of nurse-generated information (Stratis Health, 2017). These measures are: nursing assessment/interventions/response, impairments,

catheters, immobilizations, respiratory support, and oral limitations (Klingner & Moscovice, 2012; Stratis Health, 2014). Scores are based on presence of a measure. If a measure is present, a score of one is assigned; however, if a measure is not present, a score of zero is assigned. Within the nurse-generated information category there are six measures, allowing for a possible score of six (Klingner & Moscovice, 2012).

Development of the Emergency Department Transfer Communication. The Emergency Department Transfer Communication was developed specifically for critical access hospitals, as these hospitals are generally smaller and have fewer patient encounters than urban facilities, hampering efforts to gain sample sizes large enough for comparison with urban hospitals (Klingner & Moscovice, 2012). As well, due to limited specialty services in critical access hospitals, the critical access hospital emergency departments have a high patient transfer rate, necessitating excellence in communication of patient information to the next level of care provider (Klingner & Moscovice, 2012; Stratis Health, 2014).

The Emergency Department Transfer Communication was field tested during development in eight different states, including sixty-eight critical access hospitals (Klingner & Moscovice, 2012). These field tests assessed the feasibility of using in-person, train-the-trainer, and video training to collect ED quality measures from rural hospitals (Klingner & Moscovice, 2012). This study found that each training method successfully prepared personnel to gather and report the information needed for Emergency Department Transfer Communication quality measures. Stratis Health (2014) then collaborated to use these training methods and assess changes in quality measures in over 100 critical access hospitals over time, as awareness of the measures was heightened in the hospitals. Stratis Health (2014) found that longitudinal measurement of the quality indicators showed significant improvement in the measures. In

particular, nurse-generated information communication showed a 34% relative improvement rate from the third quarter of 2013 (N=4373) to the second quarter of 2014 (N=4172).

The Emergency Department Transfer Communication measures are endorsed by the National Quality Forum (NQF) and are part of the Medicare Beneficiary Quality Improvement Project (MBQIP) reporting structure (Klingner & Moscovice, 2012; Stratis Health, 2014).

Plan for Data Analysis

All data analyses were conducted using the Statistical Package for the Social Sciences (SPSS) Version 25. Statistical significance was set at $p < 0.05$ for this study.

Missing Data

Missing data were assessed for extent and pattern of missingness using the Missing Values Analysis in SPSS (Polit & Beck, 2012). Little's MCAR (Missing Completely At Random) was conducted on all variables to determine if there was a systematic pattern to the missing data or if the data were missing at random.

The situation of data missing at random was addressed using case mean substitution for items in continuous scale variables when a small proportion, less than 5%, of items are missing. This method involves finding the mean item value for the answered items on that participant's scale, and using the mean to substitute for the missing data (Polit & Beck, 2012).

In this dataset, missingness was low. There were fourteen cases with missing data. Ten of those cases were within the Hospital Consumer Assessment of Healthcare Providers and Systems survey results, with four of those ten involving only one point of missing data within the Hospital Consumer Assessment of Healthcare Providers and Systems results. As a reminder, the Hospital Consumer Assessment of Healthcare Providers and Systems results constituted four reported percentages, with three being sub-scores and the fourth being the composite of the sub-

scores. In six cases, a single datum was missing within the four scores and was determined to be missing at random. This situation lent itself well to computation of the missing datum for each case, using the formula to find that score based on the three other data present among the sub-scores and composite score. In two cases there were three missing data among the four requested scores in the Hospital Consumer Assessment of Healthcare Providers and Systems scores. This situation required case mean substitution, finding the mean of the Hospital Consumer Assessment of Healthcare Providers and Systems scores for that case and using this mean to substitute for the missing data (Polit & Beck, 2012).

In two cases, all four Hospital Consumer Assessment of Healthcare Providers and Systems data were missing. Because this was a fully missing Hospital Consumer Assessment of Healthcare Providers and Systems report, the reason for the missing data was strongly considered. Also, inclusion of these cases brought the rate of missing data for Hospital Consumer Assessment of Healthcare Providers and Systems less than 5%, indicating that the data was missing at random and was not a systematic pattern of nonresponse (Fox-Wasylyshn & El-Masri, 2005). The decision was made to maintain the sample size by imputation using sample mean substitution.

In four cases, there were missing Emergency Department Transfer Communication data. Three of these cases included the overall score for Emergency Department Transfer Communication, allowing case mean substitution for these cases. One case had no Emergency Department Transfer Communication data. Because there was less than 5% missing data, this indicated the data were missing at random (Fox-Wasylyshn & El-Masri, 2005). Therefore the decision was made to use sample mean substitution for the case with no available Emergency Department Transfer Communication data.

Demographic data were missing in six cases in this study. This included data in the categories of highest degree attained, gender, years in current position, years at the hospital, years in the community, and if the participant grew up in the community. Because the rate of missingness was over 5% for these questions, the decision was made to remove these participants from the calculations involving these items, reducing the sample size for these calculations to 66.

The final missing data were the ages of three participants in the study. With only three data missing for this question, the degree of missingness was less than 5%, indicating that the data was missing at random (Polit & Beck, 2012). The decision was made to maintain the sample size by imputation using sample mean substitution.

Statistical Assumptions

Outliers. The variables were checked for univariate outliers and normal distributions. Outliers are extreme cases, and may skew the normality of the data, violating the assumptions of normality required for the statistical tests employed (Polit & Beck, 2012). Outliers were transformed depending on the severity of the outlier and the effect on normality and linearity, after checking for data input accuracy (Polit & Beck, 2012). Details on outliers found are in Chapter 4.

Normality of the Distribution. The variables were evaluated for normality to assess skewness and kurtosis. Histograms of the data were visualized for normality. Shapiro-Wilk significance levels were calculated for each dependent variable. Transformation of variables using square root, inversion, and log 10, was considered for variables which appeared, by histogram, to be positively skewed. Further details are in Chapter 4.

Homogeneity. The assumption of homogeneity was tested for each relationship among the variables, as assessed by Levene's test for equality of variances (Laerd Statistics, 2015). For those items where the assumption of homogeneity was violated, Welch's t-test will be used rather than the standard t-test.

Data Analysis

As a reminder, the specific aims for this dissertation study were to:

1. Determine demographics, nurse-leader influence scores, and nurse-sensitive outcome scores in critical access hospitals in the United States.
2. Analyze for differences in nurse leader influence scores in critical access hospitals in North Dakota and in critical access hospitals in other states.
3. Analyze for differences in nurse-sensitive outcome scores of nurse leaders in critical access hospitals in North Dakota and critical access hospitals in other states.

Data analysis was completed for these specific aims, and is described in the following section.

Specific Aim 1: Descriptive Statistics, Influence and Outcomes Scores. Descriptive statistics were obtained for each demographic variable, influence score, and outcome score to include frequency distributions, mean, range, standard deviation, median and mode. An alpha of 0.05 was used to establish significance for all analyses. Summary statistics were obtained for each influence and outcome score, split into two groups by state variable (North Dakota vs. Other States).

An independent sample t-test was conducted for the continuous variable of age, to determine significant differences between results from North Dakota and other states. As well, one-way ANOVA was conducted for the categorical variables of gender, educational level, race, years at the hospital, years in the current position, years in the community and whether the

participant grew up within the community. The one-way ANOVA were conducted to determine significant differences between results from North Dakota and other states.

Specific Aim 2: Comparative Analysis of Influence Scores. A series of independent sample t-tests was conducted for the continuous influence variables in order to assess if differences exist in reported influence scores in North Dakota as compared to other states. These variables were the scores from the Leadership Influence over Professional Practice Environments Scale.

Specific Aim 3: Comparative Analysis of Outcomes Scores. Another series of independent sample t-tests was conducted for the continuous variables relating to outcomes in the critical access hospitals, including Emergency Department Transfer Communication (EDTC) Nurse Communication scores and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores. These were conducted to determine if differences existed between the reported outcome scores in North Dakota as compared to other states.

Summary

In order to address the purpose and specific aim of this study, the study methods included a convenience sample from nursing leaders in all thirty-six critical access hospitals in North Dakota, all of which were affiliated with the Center for Rural Health, and a convenience sample of nursing leaders from critical access hospitals in 18 other states. Data collection used a web-based survey platform to collect demographic data, gather outcome data, and assess nursing leadership characteristics using the Leadership Influence over Professional Practice Environments Scale. The data analysis plan included an exploration of the demographic data, followed by comparative analysis to assess for differences occurring in North Dakota as

compared to the other states. Significant relationships were identified in order to satisfy the specific aims. The results of this data analysis are presented in the next chapter.

CHAPTER 4

RESULTS

The purpose of this descriptive, comparative study was to examine nurse leader influence and nurse-sensitive outcome scores in critical access hospitals. The specific aims for this dissertation study were to:

1. Determine demographics, nurse-leader influence scores, and nurse-sensitive outcome scores in critical access hospitals in the United States.
2. Analyze for differences in nurse leader influence scores in critical access hospitals in North Dakota and in critical access hospitals in other states.
3. Analyze for differences in nurse-sensitive outcome scores of nurse leaders in critical access hospitals in North Dakota and critical access hospitals in other states.

This chapter is a presentation of the results of this study, offering descriptive characteristics of the sample, frequencies, comparative analysis of the data, and a summary of the results.

These analyses include the characteristics of leader influence evaluated by the Leadership Influence over Professional Practice Environments Scale and two nursing-sensitive outcomes: nurse-generated information in Emergency Department Transfer Communications, and patient satisfaction reports on the Hospital Consumer Assessment of Healthcare Providers and Systems of patients who reported that their nurses "Always" communicated well.

To accomplish these specific aims, the data analyses are presented beginning with descriptive statistics related to the sample, frequency analysis, and comparative analysis.

Management of assumptions for each analysis are presented in each section.

Specific Aim 1: Demographics, Nurse-Leader Influence and Nurse-Sensitive Outcomes Scores

This study included nurse leaders from 19 states across the United States. The survey was sent to 600 critical access hospitals with the request that a nursing leader who met the inclusion criteria complete the survey. The definition used for nurse leader inclusion in the participant group was a Chief Nursing Officer or a registered nurse who had administrative authority and responsibility for nursing department operations. Participants were divided into two groups: participants from North Dakota and participants from other states.

In North Dakota, there were 28 participants in total out of 36 critical access hospitals in the state. Originally 36 nursing leaders, one at each critical access hospital, were invited to participate. However, after consultation with the Center for Rural Health, and in keeping with the boundaries of inclusion criteria for this study as approved by the dissertation committee, the participant pool in North Dakota was expanded to include 58 nurse leaders invited to participate in the survey from other registered nurses in each hospital who met the inclusion criteria for being nursing leaders, including Assistant Directors of Nursing and Nursing Quality Assurance Directors/Coordinators. Out of 36 critical access hospitals in North Dakota, 26 hospitals were represented in the sample. Nursing leaders were only invited to participate if they publicly identified their role as being part of the nursing leadership team, specifically using titles such as Chief Nursing Officer, Director of Nursing, Assistant Director of Nursing, or Nursing Quality Assurance Director/Coordinator. Further characteristics of the sample are shown in Tables 2 through 5.

Forty-four other states' Flex Program Coordinators in the United States, outside of North Dakota, were contacted with requests for their state to participate in this research study.

Flex Program Coordinators in 19 states sent the survey out to nursing leaders at 642 critical access hospitals. Results were obtained from 44 nursing leaders in 18 of these states. One state with 78 critical access hospitals in the state had no responses from nursing leaders. With removal of the state with no responses, this leaves 44 nurse leader responses from 18 states, outside of North Dakota, in which there are a total of 564 critical access hospitals.

In total, there were 28 participants from North Dakota and 44 participants from 18 other states in the United States. Further data for these participants is included in Tables 2 through 5.

Descriptive Statistics for Demographic Variables

To describe the sample, frequencies and percentages were calculated for each nominal and ordinal demographic variable.

Table 2. Frequency Table for Gender and Ethnicity

Variable	<i>n</i>	%	Cumulative %
Gender			
Female	65	90.28	90.28
Male	2	2.78	93.06
Missing	5	6.94	100
Ethnicity			
Caucasian	65	90.28	90.28
American Indian/Alaska Native	2	2.78	93.06
Missing	5	6.94	100
Spanish Hispanic Latinx			
Not Spanish/Hispanic/Latinx	65	90.28	90.28
Spanish	1	1.39	91.67
Hispanic	1	1.39	93.06
Missing	5	6.94	100

Frequencies and Percentages for Gender and Ethnicity. The most frequently observed category of Gender was female ($n = 65, 90\%$). The most frequently observed category of Ethnicity was Caucasian ($n = 65, 90\%$) with only two participants identifying as Spanish or

Hispanic ($n = 2, 2.78\%$) and two as American Indian/Alaska Natives ($n = 2, 2.78\%$). This lack of diversity is concerning, as it reflects lack of both ethnic and gender diversity, which is an ongoing national concern (Budden, Zhong, Moulton & Cimiotti, 2013). These data are detailed in Table 2.

Frequencies and Percentages for Education and Length of Time. Participants were asked their highest level of education attained. The most frequently observed category of highest degree attained was a Baccalaureate in Nursing ($n = 28, 39\%$) (Table 3).

Rural nursing theory indicates that being a longer-term member of the community provides one with “insider” status in the community (Long & Weinert, 1989). Therefore, demographic questions were asked about length of time at the hospital, in the current position at the hospital, and as part of the community. Notable results include high numbers of nursing leaders having been part of the community or hospital community for longer terms, as shown in Table 3. Although the majority of the participants, 56.9% ($n = 41$), did not grow up within the community, 58.3% ($n = 42$) had been part of the community for more than 20 years, with 69.4% ($n = 50$) being part of the community for 10 years or more. Despite these lengthy times living in the community, when asked if the participant grew up in the community the most frequently observed response was “no” ($n = 41, 56.9\%$). Within the critical access hospital, 51.4% ($n = 37$) of the participants had been in some role within the hospital for more than 10 years, with 72.1% ($n = 52$) working at their same facility for more than 5 years. In regards to years in their current nursing leadership role, only 16.7% ($n = 12$) had been in their role for more than 10 years. A majority of nursing leaders had been in their roles for less than 5 years 49.9% ($n = 36$). Frequencies and percentages are presented in Table 3.

Table 3. Frequency Table for Education and Time in Community or at Hospital

Variable	<i>n</i>	%	Cumulative %
Highest Degree Attained			
Associate Degree in Nursing	14	19.44	19.44
Baccalaureate Degree in Nursing	28	38.89	58.33
Masters Degree in Nursing	20	27.78	86.11
Professional Degree in Other than Nursing	2	2.78	88.89
Doctorate of Nursing Practice (DNP)	1	1.39	90.28
Doctor of Philosophy in Nursing (PhD)	1	1.39	91.67
Missing	6	8.33	100
Length of time in current position as a nursing leader at that critical access hospital			
Less than 2 years	17	23.61	23.61
2 years to less than 5 years	19	26.39	50
5 years to less than 10 years	19	26.39	76.39
10 years or more	12	16.67	93.06
Missing	5	6.94	100
Length of time working at that critical access hospital in any role			
Less than 2 years	5	6.94	6.94
2 years to less than 5 years	10	13.89	20.83
5 years to less than 10 years	15	20.83	41.67
10 years or more	37	51.39	93.06
Missing	5	6.94	100
Length of time as a part of the community in which the hospital is located			
Less than 2 years	3	4.17	4.17
2 years to less than 5 years	5	6.94	11.11
5 years to less than 10 years	9	12.50	23.61
10 years to less than 20 years	8	11.11	34.72
20 years or more	42	58.33	93.06
Missing	5	6.94	100
Grew up in community			
Yes	26	36.11	36.11
No	41	56.94	93.06
Missing	5	6.94	100

Note. N = 72. Due to rounding errors, percentages may not equal 100%.

Summary of Age Statistics. The observations for age of all participants combined had an average of 48.13 years ($n = 67$, $SD = 10.19$, Range = 26 - 67, $Mdn = 49.00$). The observations for age of participants from North Dakota had an average of 48.39 ($n = 28$, $SD = 10.62$, Range = 26 – 65, $Mdn = 48.50$). The observations for age of participants from states other than North Dakota had an average of 47.95 ($n = 39$, $SD = 10.00$, Range = 28 - 67, $Mdn = 49.00$). Note that 4 participants declined to provide age data and were excluded from this analysis. Skew was assessed as symmetrical ($>|2|$) and kurtosis was assessed as a normal distribution (kurtosis < 3) with low tendency to produce outliers (Westfall & Henning, 2013) (Table 4).

Table 4. Descriptive Statistics for Age Variable

Variable	n	Mean	SD	Range	Median
Age Overall	67	48.13	10.19	26 - 67	49.00
Age ND	28	48.39	10.62	26 - 65	48.50
Age Other States	39	47.95	10.00	28 - 67	49.00

Frequencies and Percentages of Participating States. As previously detailed, North Dakota was the first state where concentrated data collection, with great assistance from the Center for Rural Health, occurred. For this reason, the most frequently observed state where participants work was North Dakota ($n = 28$, 39%). Frequencies and percentages of all participating states are presented in Table 5. In the states represented by at least one nursing leader response, these states included 516 of the 1349 critical access hospitals in the United States. Seventy-two respondents represent a 13.95% overall response rate for those 516 critical access hospitals. Table 5 indicates the numbers of critical access hospitals in the forty-five states in which critical access hospitals are located. The numbers of critical access hospitals changes over time, with Table 5 representing the values as of October 11, 2019 (Flex Monitoring Team, 2019). In

North Dakota, 77.78% of the 36 critical access hospitals had representation from nursing leadership, whereas in other states there was representation from 44 nursing critical access hospital nursing leaders, representing 9.17% of the 480 critical access hospitals from those states.

Table 5. Critical Access Hospital Nursing Leader Response Rates by State

State	<i>n</i>	<i>Frequency %</i>	<i># Nurse Leaders</i>	<i>% of CAH Nurse Leaders Participating</i>
North Dakota	28	38.89	36	77.78
Nebraska	7	9.72	64	10.94
West Virginia	6	8.33	21	33.33
Michigan	4	5.56	37	10.81
Colorado	3	4.17	32	9.38
Kentucky	3	4.17	27	7.41
Wisconsin	3	4.17	58	6.90
Wyoming	3	4.17	16	18.75
California	2	2.78	34	5.88
Idaho	2	2.78	27	7.40
New Hampshire	2	2.78	13	7.69
Pennsylvania	2	2.78	15	13.33
Arizona	1	1.39	15	6.67
Hawaii	1	1.39	9	11.11
Massachusetts	1	1.39	3	33.33
Missouri	1	1.39	35	2.86
Nevada	1	1.39	13	7.69
New Mexico	1	1.39	10	10.00
Oklahoma	1	1.39	40	5.00
Totals	72	100.03	516	13.95

Note. Due to rounding errors, percentages may not equal 100%. CAHs means Critical Access Hospitals.

Table 6. Descriptive Statistics for Leadership Influence over Professional Practice Environments Scale Variables by State Grouping

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	Range	<i>Mdn</i>
Overall Influence Score					
North Dakota	28	3.18	0.37	2.42 – 3.18	3.12
Other States	44	3.37	0.35	2.24 – 3.98	3.42
Status					
North Dakota	28	3.37	0.48	2.30 – 4.00	3.40
Other States	44	3.51	0.36	2.50 – 4.00	3.50
Leadership Expectations					
North Dakota	28	3.25	0.48	2.00 – 4.00	3.29
Other States	44	3.39	0.42	2.14 – 4.00	3.43
Internal Strategy & Resolve					
North Dakota	28	3.06	0.55	1.89 – 3.89	3.11
Other States	44	3.46	0.35	2.67 – 4.00	3.56
Authority					
North Dakota	28	3.37	0.56	2.00 – 4.00	3.56
Other States	44	3.55	0.48	2.25 – 4.00	3.75
Access to Resources					
North Dakota	28	2.72	0.51	1.33 – 3.67	2.75
Other States	44	2.98	0.47	1.75 – 3.92	2.92
Collegial Administrative Approach					
North Dakota	28	3.26	0.40	2.54 – 4.00	3.23
Other States	44	3.45	0.38	2.08 – 4.00	3.52

Descriptive Statistics for Leadership Influence over Professional Practice Environments Scale scores between Critical Access Hospitals in North Dakota and in Other States

Descriptive statistics for the overall and subcategories were evaluated for mean, median, mode, standard deviation, and range of values. Summary statistics were calculated for the Leadership Influence over Professional Practice Environments Scale (LIPPES) Overall score as well as subscores for Status, Leadership Expectations, Internal Strategy and Resolve,

Authority, Access to Resources and Collegial Administrative Approach. Statistics were calculated for the states split into two groups of North Dakota and Other States to allow for analysis of the differences among the two groups. In general, on this four-point Likert-type scale, means were between 3.06 and 3.37 in North Dakota, and between 3.37 and 3.55 for Other States. However, the mean for “Access to Resources” dipped lower, at 2.72 in North Dakota and 2.98 in Other States, which is consistent with concerns of small rural hospitals and the lack of close and available resources (Bish, Kenny & Nay, 2012). Notable is that the Overall and every subcategory score was higher in Other States than in North Dakota. Details are found in Table 6.

Three subcategory variables are asked of patients after they have been treated as an inpatient at the hospital, including variables related to nurse courtesy and respect, nurses listening carefully, and nurses explaining things in a way the patient could understand. These three variables are then used in the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) report in combination to create the “My nurse communicated well with me” variable.

In this sample, the highest means were reported for the courtesy and respect variable (North Dakota mean = 91.96%, Other States mean = 90.58%), followed by the listen carefully (North Dakota mean = 87.51%, Other States mean = 85.51%) and then explain well (North Dakota mean = 79.53%, Other States mean = 81.44%) variables. The overall category of nurses communicating well, which is a composite score of the above three variables, predictably showed a mean toward the middle of the above category means, of 87.46% in North Dakota and 85.51% in other states. Notably and predictably, the modes of each variable are the same, at 100%, which is the goal score for each of these variables. It is of interest that the variable

relating to explaining things in a way the patient could understand is the lowest mean with the greatest range of values. This variable has a component not just of communication, but also relating to the ability of the nurses to communicate their knowledge of the subject. In this case, knowledge levels of the nurses may have an effect on this variable, where this may not have the same effect on courtesy, respect, and listening abilities. Details are found in Table 7.

Table 7. Descriptive Statistics for Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Nurse Communication Variables

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	Range	<i>Mdn</i>
Overall Communication	My nurse communicated well with me.				
North Dakota	28	87.46	8.77	71.00 – 100.00	87.60
Other States	44	85.51	9.19	59.00 – 100.00	84.70
Courtesy & Respect	How often did the nurses treat you with courtesy and respect?				
North Dakota	28	91.96	8.30	72.00 – 100.00	92.80
Other States	44	90.58	7.86	71.20 – 100.00	91.67
Listened Carefully	How often did nurses listen carefully to you?				
North Dakota	28	87.51	9.41	72.00 – 100.00	85.85
Other States	44	85.51	11.62	55.00 – 100.00	87.04
Explained Well	How often did nurses explain things in a way you could understand?				
North Dakota	28	79.53	15.22	50.00 – 100.00	80.00
Other States	42	81.44	12.93	45.80 – 100.00	79.97

Descriptive Statistics for Emergency Department Transfer Communication in Critical Access Hospitals in North Dakota and in Other States

The Emergency Department Transfer Communication (EDTC) of nurse-generated information goal is 100% for each subcategory and the overall score, which includes all six subcategories: nursing notes, sensory status, catheters/IVs, immobilizations, respiratory support, and oral restrictions. Every mean is above 94%, and every mode is 100% (Table 8).

The Emergency Department Transfer Communication (EDTC) variables were assessed for critical access hospitals grouped in North Dakota and Other States. Descriptive statistics for The Emergency Department Transfer Communication (EDTC) scores were evaluated for mean, median, mode, standard deviation, and range values. Statistics were calculated for the states split into two groups of North Dakota and Other States to allow for analysis of the differences among the two groups. Six subcategory variables are evaluated after patients have been transferred from the critical access hospital emergency department to a hospital for further treatment. These variables include communication to the receiving hospital of nursing notes, sensory status, information about catheters and intravenous lines, oral restrictions, sensory status, and immobilizations. These six variables are then used in the Emergency Department Transfer Communication (EDTC) report in combination to create the “Overall Emergency Department Transfer Communication (EDTC) Score” variable.

In this sample, the highest means were reported for the respiratory support (North Dakota mean = 99.85%, Other States mean = 99.13%), catheters and intravenous lines (North Dakota mean = 99.11%, Other States mean = 99.18%), and immobilizations (North Dakota mean = 97.81%, Other States mean = 98.84%) categories of reporting. These categories were closely followed by oral restrictions (North Dakota mean = 97.71%, Other States mean = 97.73%), sensory status (North Dakota mean = 97.89%, Other States mean = 96.68%), and nursing notes (North Dakota mean = 96.09%, Other States mean = 97.42%) variables. The overall category of Emergency Department Transfer Communication showed a means of 94.29% in North Dakota and 95.32% in other states. Notably and predictably, the modes of each subcategory variable are the same, at 100%, which is the goal score for each of these variables. Details are found in Table 8.

Table 8. Descriptive Statistics for Emergency Department Transfer Communication**Variables**

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	Range	<i>Mdn</i>
Nursing Notes					
North Dakota	28	96.09	6.35	80.00 – 100.00	100.00
Other States	44	97.42	5.04	80.77 – 100.00	100.00
Sensory Status					
North Dakota	28	97.89	4.99	80.00 – 100.00	100.00
Other States	44	96.68	6.18	71.05 – 100.00	100.00
Catheters/IVs					
North Dakota	28	99.11	1.98	93.55 – 100.00	100.00
Other States	44	99.18	1.57	94.74 – 100.00	100.00
Oral Restrictions					
North Dakota	28	97.71	5.24	80.00 – 100.00	100.00
Other States	44	97.73	5.05	76.00 – 100.00	100.00
Respiratory Support					
North Dakota	28	98.85	3.15	87.50 – 100.00	100.00
Other States	44	99.13	2.19	88.00 – 100.00	100.00
Immobilizations					
North Dakota	28	97.81	5.67	78.00 – 100.00	100.00
Other States	44	98.84	3.02	86.00 – 100.00	100.00
Overall Score					
North Dakota	28	94.29	8.72	65.00 – 100.00	98.00
Other States	44	95.32	6.49	76.00 – 100.00	98.00

Note. EDTC means Emergency Department Transfer Communication

Summary of Specific Aim 1

The demographics, nurse-leader influence scores, and nurse-sensitive outcome scores in critical access hospitals in North Dakota and in other states show that the nursing leaders have been part of their communities for a more than 20 years, and ages hover around 48 years. The majority of nursing leaders worked in their hospital for over 10 years, and in their leadership roles for less than 5 years. The Leadership Influence over Professional Practice Environments Scale (LIPPES) scores in North Dakota were lower in all categories than in other states.

However, a higher percentage of the nursing leaders responded in North Dakota, as compared to other states. The next section analyzes for significance of differences between these two groups. Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores and the Emergency Department Communication Transfer (EDTC) scores were explored with a comparative analysis to follow later in this chapter.

Specific Aim 2: Comparative Analysis for Differences in Nurse Leader Influence Scores Between Critical Access Hospitals in North Dakota and in Other States

In this section, the means of nurse leaders' influence scores are compared between a group of leaders in North Dakota and a group of leaders in other states represented in this study (Table 6). Two-tailed independent samples *t*-tests were conducted to examine if the means of scores from the Leadership Influence over Professional Practice Environments Scale (LIPPES) were significantly different in North Dakota critical access hospitals compared to other states.

Outliers

Outliers in the data were assessed via visualization of the box plots. There were outliers in the data, as assessed by inspection of a boxplot for values greater than 1.5 box-lengths from the edge of the box. These outliers were transformed using the next largest or smallest value depending upon on which side of the plot the outlier was positioned. This method is a valid technique to increase the normality of the curve and yet also keep each data point in its relative position (Altman, 1991; Fox, 2016; Pedhazur, 1997).

Comparison of Means

The result of the two-tailed independent samples *t*-test for the Collegial Administrative Approach variable was significant based on an alpha value of 0.05, $t(70) = -2.01$, $p = .048$, indicating that the mean Collegial Administrative Approach scores were significantly different

between the North Dakota ($M = 3.26$, $SD = 0.39$) group and other states ($M = 3.45$, $SD = 0.38$). The mean of Collegial Administrative Approach was significantly lower than the mean of Collegial Administrative Approach in the other states responding to the survey (Table 9).

For the variable of Authority, the result of the two-tailed independent samples t -test was not significant based on an alpha value of 0.05, $t(70) = -1.43$, $p = .158$, indicating that the means between the groups in North Dakota ($M = 3.37$, $SD = 0.56$) as compared to other states ($M = 3.55$, $SD = 0.48$) are not significantly different (Table 9).

In regards to the variable of Access to Resources, the result of the two-tailed independent samples t -test was significant based on an alpha value of 0.05, $t(70) = -2.23$, $p = .029$, suggesting that the mean of Access to Resources was significantly different between North Dakota and other states. The mean of Access to Resources in the North Dakota ($M = 2.72$, $SD = 0.51$) category of State was significantly lower than the mean of Access to Resources in the other states ($M = 2.98$, $SD = 0.47$) (Table 9).

Leadership Expectations t -test analysis revealed no significant difference based on an alpha value of 0.05, $t(70) = -1.39$, $p = .170$. This finding suggests that the mean of Leadership Expectations was not significantly different between North Dakota ($M = 3.25$, $SD = 0.48$) and other states ($M = 3.39$, $SD = 0.42$) (Table 9).

The result of the two-tailed independent samples t -test on the variable of the Leadership Influence over the Professional Practice Environment Scale Overall score was significant based on an alpha value of 0.05, $t(70) = -2.70$, $p = .031$. This suggests that the mean of the Overall

score was significantly lower in North Dakota ($M = 3.18$, $SD = 0.37$) as compared to other states ($M = 3.37$, $SD = 0.35$) (Table 9).

Table 9. Differences in Leadership Influence over the Professional Practice Environments Scale Scores between North Dakota and Other States

Variable	<i>M</i>	<i>SD</i>	<i>t-test</i>	<i>p</i>
Collegial Administrative Approach				
North Dakota	3.26	0.40	-2.01*	.048
Other States	3.45	0.38		
Internal Strategy & Resolve				
North Dakota	3.06	0.55	-3.46*	.001
Other States	3.46	0.35		
Access to Resources				
North Dakota	2.72	0.51	-2.23*	.029
Other States	2.98	0.47		
Leadership Expectations				
North Dakota	3.25	0.48	-1.39	.170
Other States	3.39	0.42		
Authority				
North Dakota	3.37	0.56	-1.43	.158
Other States	3.55	0.48		
Status				
North Dakota	3.37	0.48	-1.39	.172
Other States	3.51	0.36		
Overall Influence Score				
North Dakota	3.18	0.37	-2.20*	.031
Other States	3.37	0.35		

Note. * indicates a significant difference ($p < .05$). $N = 72$.

For two variables, homogeneity of variances could not be confirmed as Levene's Test for Equality of Variances returned p values less than .05. These variables were Internal Strategy and Resolve ($p = 0.003$) and Status ($p = 0.013$). For these variables, a Welch t-test was run to determine if there were differences between the means. The Welch's t-test is more

reliable when the two samples have unequal variances and unequal sample sizes (Ruxton, 2006).

The result of the Welch two-tailed independent samples *t*-test for Internal Strategy and Resolve was significant based on an alpha value of 0.05, $t(41.20) = -3.46, p = .001$, suggesting that the mean of Internal Strategy and Resolve was significantly different between North Dakota ($M = 3.06, SD = 0.55$) and other states ($M = 3.46, SD = 0.35$) (Table 9).

For the variable of Status, the result of the Welch two-tailed independent samples *t*-test was not significant based on an alpha value of 0.05, $t(46.72) = -1.39, p = .172$, suggesting that the mean of Status was not significantly different between the North Dakota ($M = 3.37, SD = 0.48$) and other states ($M = 3.51, SD = 0.36$) (Table 9).

Summary of Specific Aim 2

The Leadership Influence over the Professional Practice Environment Scale scores were analyzed for differences between the means of the group of nursing leaders in North Dakota as compared to the nursing leader responses from other states. Analysis revealed significant differences between the groups in the subcategories of Collegial Administrative Approach, Access to Resources, Internal Strategy and Resolve, and the Overall Leadership Influence over the Professional Practice Environment Scale score (Table 9). No significant differences were found between the means for Authority, Leadership Expectations, and Status (Table 9).

Specific Aim 3: Comparative Analysis for Differences in Nurse-Sensitive Outcome Scores between Critical Access Hospitals in North Dakota and in Other States

To address this specific aim, two-tailed independent samples *t*-tests were conducted to examine whether the means of scores from the Emergency Department Transfer

Communications (EDTC) and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores were significantly different between the group of critical access hospitals in North Dakota as compared to the group of critical access hospitals in other states represented in this study.

Table 10. Differences in Emergency Department Transfer Communications between North Dakota and Other States

Variable	<i>M</i>	<i>SD</i>	<i>t-test</i>	<i>p</i>
Nursing Notes				
North Dakota	96.09	6.35		
Other States	97.42	5.04	-0.97	.336
Sensory Status				
North Dakota	97.89	4.99		
Other States	96.68	6.18	0.84	.402
Catheters & IVs				
North Dakota	99.11	1.98		
Other States	99.18	1.57	-0.17	.867
Immobilizations				
North Dakota	97.81	5.67		
Other States	98.84	3.02	-1.00	.322
Respiratory Support				
North Dakota	98.85	3.15		
Other States	99.13	2.19	-0.45	.657
Oral Restrictions				
North Dakota	97.71	5.24		
Other States	97.73	5.05	-0.01	.991
Overall Score				
North Dakota	94.29	8.72		
Other States	95.32	6.49	-0.56	.575

Note. * indicates a significant difference ($p < .05$). $N = 72$.

Outliers

Outliers in the data were assessed via visualization of the box plots. There were outliers in the data, as assessed by inspection of a boxplot for values greater than 1.5 box-lengths from the edge of the box. These outliers were transformed using the next largest or smallest value depending upon on which side of the plot the outlier was positioned. This method is a valid technique to increase the normality of the curve, yet also keep each data point in its relative position (Altman, 1991; Fox, 2016; Pedhazur, 1997).

Comparison of Means for Emergency Department Transfer Communication

The result of the two-tailed independent samples *t*-tests for the Emergency Department Transfer Communication (EDTC) variables were not significant for any of the variables, with *p* values greater than .05 in all comparisons (Table 10). This indicates that the means between the group of nursing leaders in North Dakota and nursing leaders in other states are not significantly different from one another in regards to Emergency Department Transfer Communication outcomes.

Comparison of Means for Hospital Consumer Assessment of Healthcare Providers and Systems

The result of the two-tailed independent samples *t*-tests for Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) variables were not significant for any of the variables, with *p* values greater than .05 in all comparisons (Table 11). This indicates that the means between the group of nursing leaders in North Dakota and nursing

leaders in other states are not significantly different from one another in regards to Hospital Consumer Assessment of Healthcare Providers and Systems outcomes.

Table 11. Differences in Hospital Consumer Assessment of Healthcare Providers and Systems between North Dakota and Other States

Variable	<i>M</i>	<i>SD</i>	<i>t-test</i>	<i>p</i>
Courtesy and Respect				
North Dakota	91.96	8.30	0.71	.480
Other States	90.58	7.86		
Listen Carefully				
North Dakota	87.51	9.41	0.77	.446
Other States	85.51	11.62		
Explain Well				
North Dakota	79.53	15.22	-0.57	.573
Other States	81.44	12.93		
Communicated Well				
North Dakota	87.46	8.77	0.89	.375
Other States	85.51	9.19		

Note. * indicates a significant difference ($p < .05$). $N = 72$.

As stated above, the Shapiro-Wilk's test for normality was violated for each of these variables. Although the Q-Q Plots appeared normal, these are visual observations, which may be subject to interpretation. Concern regarding normality of the curves was addressed by also examining the data transformed using a Log10 transformation for a positive skew on the curve. Data transformed using Log10, and then analyzed using an independent samples *t*-test, also had *p* values greater than .05, indicating that the means between the group of nursing leaders in North Dakota and nursing leaders in other states are not significantly different from one

another in regards to Emergency Department Transfer Communications and Hospital Consumer Assessment of Healthcare Providers and Systems outcomes.

However, the Shapiro-Wilk test for normality was violated for each transformed variable. Therefore, as an extra check, independent samples Mann-Whitney U tests, which do not require the assumption of normality, were carried out for these same variables. In every case, the significance was greater than .05, indicating, as did the t-tests, that the means of the group of nursing leaders in North Dakota and of nursing leaders in other states are not significantly different from one another in regards to Emergency Department Transfer Communications and Hospital Consumer Assessment of Healthcare Providers and Systems outcomes.

Summary of Specific Aim 3

The Emergency Department Transfer Communications and Hospital Consumer Assessment of Healthcare Providers and Systems scores were analyzed for differences between the mean of the group of nursing leaders in North Dakota and that of the nursing leader responses from other states. Analysis revealed no significant differences between the groups for any variable in the Emergency Department Transfer Communications and Hospital Consumer Assessment of Healthcare Providers and Systems scores (Table 11).

Summary

Comparative analysis between the Critical Access Hospital nursing leaders in North Dakota as compared to Critical Access Hospital nursing leaders in other states has revealed four variables with significant differences across the two groups. The Leadership Influence over the Professional Practice Environment Scale (LIPPES) subcategories of Collegial Administrative Approach, Internal Strategy and Resolve, and Access to Resources, as well as

the Overall score, were all significantly lower in North Dakota than in other states. Outcome variables in the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) and Emergency Department Transfer Communications (EDTC) category 6, Nursing Communications, scores did not show significant differences between the two groups. The power analysis of the significant comparisons indicates adequate power (0.97) for Internal Strategy and Resolve and lower power for Collegial Administrative Approach (0.62), Access to Resources (0.70) and the Overall score (0.70) due to the smaller effect sizes for those three variables.

CHAPTER 5

DISCUSSION

The purpose of this descriptive, comparative study was to examine nurse leader influence and nurse-sensitive outcome scores in critical access hospitals. The specific aims for this dissertation study were to:

1. Determine demographics, nurse-leader influence scores, and nurse-sensitive outcome scores in critical access hospitals in the United States.
2. Analyze for differences in nurse leader influence scores in critical access hospitals in North Dakota and in critical access hospitals in other states.
3. Analyze for differences in nurse-sensitive outcome scores of nurse leaders in critical access hospitals in North Dakota and critical access hospitals in other states.

This chapter includes a summary of this study, along with important conclusions related to the specific aims and informed by the findings of the study. Each specific aim is addressed with conclusions related to the relevant literature. This chapter also presents recommendations for actions and recommendations for future research.

Sample

Seventy-two nursing leaders, out of a population of 600 critical access hospital nursing leaders surveyed across 19 states (Table 5), responded to this survey over the span of a year from fall 2018 to fall 2019. Nursing leaders were invited to participate if they publicly identified their role as being part of the nursing leadership team, specifically using titles such as Chief Nursing Officer, Director of Nursing, Assistant Director of Nursing, or Nursing Quality Assurance Director/Coordinator. In each of these roles, the participants had the ability to influence nursing practice in the critical access hospital; therefore, none were excluded from the study.

Nursing leaders in critical access hospitals were contacted for inclusion in the study by Flex Monitoring Program managers in each state. These managers work with nursing leaders at critical access hospitals to collect quality outcome data, such as for Emergency Department Transfer Communication reporting. All forty-four Flex Monitoring Program managers were contacted across the United States. Due to differences in the ability to connect with nursing leaders in each state, program managers from 20 states volunteered to assist in disseminating the information and link to the survey. Participation was obtained from 72 nursing leaders representing 516 critical access hospitals in 19 states across the United States (Table 5). Twenty-eight of these nursing leaders were from critical access hospitals in North Dakota. Forty-four of the nursing leaders were from critical access hospitals in 18 other states in the United States.

Age. The participants' range of age was from a minimum of 26 years to a maximum of 67 years, with a median of 49 years, which is quite close to the mean of 48.13 years of age (SD = 10.19 years, and Range = 41 years). Assuming a retirement age of 65, over half of the participants have greater than 16 years prior to retirement. These data may be significant when considering the length of time each nursing leader may influence the nursing practice environment in their career, and the impact that supporting these nursing leaders may have in years to come.

Educational Levels. Educational levels of the nursing leaders included two nursing leaders (2.78%) with doctoral level education, two (2.78%) with a professional degree outside of nursing, twenty nurses (27.78%) who had a master's degree in nursing, twenty-eight (38.89%) with baccalaureate degrees in nursing, and fourteen (19.44%) with associate degrees in nursing. In contrast, a recent study of urban and suburban hospital nursing leaders, with titles including Chief or Associate Chief Nursing Officer, Vice President and Associate Vice President, Manager

and Assistant Manager, Clinical Nurse Specialist, and Attending Nurse, found no nurses who held a degree other than baccalaureate (35%), master's or higher (53.1%) or doctoral (8.9%) (Adams, Djukic, Gregas, and Fryer, 2018) degree. These differences are expected based on research showing that rural nurses and healthcare personnel generally have lower levels of education compared to those in more urban areas (Bish, Kenny & Nay, 2012; Hauenstein, Glick, Kane, Kulbok, Barbero, and Cox, 2014; Newhouse, Morlock, Pronovost and Sproat, 2011; Skillman, Palazzo, Keepnews, & Hart, 2006; Warren & Smalley, 2014). The reported levels of education present an opportunity to develop more support systems for nurse leaders in critical access hospital environments.

Ethnicity, Gender, and Hispanic/Latinx Status. Although the hope was to elicit some comparisons across different ethnicities and genders in this study, the data show a homogeneity of the sample, with 90.28% (N=65) of the participants being of Caucasian descent, identifying as female in gender, and not Hispanic nor Latinx. Only two participants identified in the gender, Ethnicity, and Hispanic/Latinx categories as male in gender, American Indian/Alaska Native, or Hispanic/Latinx. Five participants did not respond to these questions. Although the prediction for participants in North Dakota was that the majority of participants would be Caucasian, female, and non-Hispanic/Latinx, there was a lack of ability to make such a prediction for the rest of the nation. However, the data show a similar homogeneity across the participants from all states.

Outcomes Data. Some nursing leaders expressed difficulty finding Emergency Department Transfer Communications and Hospital Consumer Assessment of Healthcare Providers and Systems data as a barrier to completion of the survey, yet expressed their impression of this type of research as important future work. Of note, in North Dakota the Center for Rural Health supported this research by emailing the nursing leadership group in North

Dakota with encouragement to participate, and with assistance to participants to access their outcome data. This is important to note for future research, as participation was improved with the removal of the need for nursing leaders to locate their own data. It is suggested for future studies to obtain permission to access Emergency Department Transfer Communications and Hospital Consumer Assessment of Healthcare Providers and Systems data directly, and match the data back to participant data in the study.

In the Emergency Department Transfer Communication of nurse-generated information, the goal is 100% for each subcategory and the overall score, which includes all six subcategories. A notable aspect of these results is that every mean is above 94%, and every mode is 100%, indicating strong trending toward the 100% goal.

Major Findings

The demographic data show that the majority of nursing leaders have been part of their communities for more than 20 years, and the median age is 48 years. These findings are interesting in that the nurse leaders have longevity in their communities, which contributes to the community viewpoint of the leaders as being “insiders” (Long & Weinert, 1989). As insiders, the leaders generally have the respect of long-term members of the community (Long & Weinert, 1989), contributing to their ability to influence the professional practice work environment as depicted in the theoretical foundation of the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives (MILE ONE) (Adams, Ives Erickson, Jones & Paulo, 2009). In addition, the median age shows that the nurse leaders have, on average, over 16 years prior to a retirement age of 65. This length of time gives the nursing leaders longevity in their abilities to influence positive outcomes.

The majority of nursing leaders have been part of their hospital for more than 10 years, but have been in their leadership roles for less than 5 years. Also, the educational levels of the nurse leaders show a majority with a baccalaureate degree or Associate degree (58.33%), whereas a recent study of nursing leaders in urban and suburban hospitals, by Adams, Djukic, Gregas and Fryer (2018), found there were no nursing leaders with Associate degrees, baccalaureate education was in the minority (35%), and Master's or higher (62%) was in the majority. These findings of 5 years or less in the leadership role, and the lower levels of education as compared to urban and suburban environments, present an opportunity to assist critical access hospital nursing leaders using various means of support, such as educational opportunities, mentorship programs, and facilitated support networks.

Ethnicity, gender, and Hispanic/Latinx status show homogeneity across the sample, with over 90% of the participants identifying as Caucasian, female, and non-Hispanic/Latinx. However, these results are not reflective of gender, racial and ethnic diversity in the rural United States (Lee & Sharp, 2017). In a study of more than 27,000 US Census defined regions from the 2010 census, Lee and Sharp (2017) found that, contrary to popular opinion, racial and ethnic diversity in several differently defined rural settings was at minimum one-fifth (20%) of the population, sometimes rising to be the majority of the population. The findings of nursing leadership diversity in this study highlight an opportunity for future work to eliminate disparities in this area. Having a nursing leadership workforce reflective of the makeup of the community may contribute to improved health outcomes for the entire community.

Nurse Leader Influence. The Leadership Influence over the Professional Practice Environment Scale (LIPPES) scores were analyzed for differences between the means of the group of nursing leaders in North Dakota as compared to the nursing leader responses from other states. Analysis

revealed four of the seven categories showing significantly lower scores in North Dakota as compared to other states in the subcategories of Collegial Administrative Approach, Access to Resources, Internal Strategy and Resolve, and the Overall Leadership Influence over the Professional Practice Environment Scale score (Table 10). Notably, the effect sizes of these differences showed one category, the Internal Strategy and Resolve category, as having an effect size (87%) categorized as large (Cohen, 1988). The other three categories had moderate effect sizes. The effect sizes of the differences between results in North Dakota and other states is important to consider. In this case, not only does the variable of state location of the hospital mean that nurse leaders at critical access hospitals in North Dakota had statistically significant lower responses regarding Internal Strategy and Resolve, but also, the effect size shows that the score of an average nurse leader in North Dakota would be 0.87 standard deviations away from the mean score of a nurse leader from another state (Coe, 2002). This converts to approximately 81% of the North Dakota leaders indicating lower scores than the mean for nursing leaders in Other States in the Internal Strategy and Resolve category (Coe, 2002). This lends a more complete story to the analysis of the Internal Strategy and Resolve variable. With approximately 81% of the North Dakota leaders reporting lower internal strategy and resolve than nursing leaders in other states, this creates an area of concentration to support North Dakota nurse leaders in critical access hospitals.

Similarly, the variables of Access to Resources and the Overall Leadership Influence over Professional Practice Environments Scale score showed moderate effect sizes of $d=0.53$, meaning that the score in each category for the average nurse leaders at a critical access hospital in North Dakota is predicted to be 0.53 standard deviations away from the mean score of nurse leaders in critical access hospitals from the Other States category (Coe, 2002). This computes to

approximately 69% of nurse leaders at critical access hospitals in North Dakota indicating lower scores than the mean for nursing leaders in Other States in these categories. This information should be given careful consideration in regards to the resources put forward to assist critical access hospital nurse leaders in this case.

The nurse leadership influence category of Collegial Administrative Approach also showed a moderate effect size of $d=0.48$, indicating that the average score from critical access hospital nurse leaders in North Dakota could be predicted to be 0.48 standard deviations from the mean score from nurse leaders in other states. This translates to approximately 68% of the nurse leaders in North Dakota indicating a lower score than the mean of nurse leaders from other states (Coe, 2002).

In the cases where moderate effect sizes were found, including Collegial Administrative Approach, Access to Resources, and the Overall influence score, action taken in response to these findings should be carefully considered. First, consider that no harm is anticipated to come to patients by putting forth efforts to improve nurse leaders' abilities to positively influence the professional practice work environment. However, such efforts are most likely to need funding and other resources, which should be used wisely. In the case of these moderate effect sizes, the Overall Influence score will be affected by differences made in the subcategory scores. Therefore, it is the subcategories that require focus, rather than the overall score alone. The categories of Internal Strategy and Resolve, Collegial Administrative Approach and Access to Resources may be focus areas for future improvement efforts.

Although influence categories all scored lower in North Dakota than in other states, there were no significant differences found between the subcategory means for Authority, Leadership Expectations, and Status (Table 11). This is of interest when comparing a recent study of urban

and suburban differences in hospital nurse leadership influence in relation to nurse sensitive indicators of catheter associated urinary tract infections (CAUTI), falls with injury, pressure ulcers, noise, physician communication, nurse communication, room cleanliness, and staff responsiveness (Adams, Djukic, Gregas & Fryer, 2018). This study showed that leadership expectations of staff were closely linked with the largest number, six, of nurse sensitive indicators, authority with four indicators, access to resources linked to three indicators, internal strategy and resolve with two indicators, and status linked to one indicator (Adams, Djukic, Gregas & Fryer, 2018). Adams, Djukic, Gregas and Fryer (2018) found that Internal Strategy and Resolve was related to physician communication and falls with injury rates.

Nurse-Sensitive Outcomes. The Emergency Department Transfer Communications (EDTC) and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores were analyzed for differences between the mean of the group of nursing leaders in North Dakota and the mean of the nursing leader responses from other states. Analysis revealed no significant differences between the groups for any variable in the Emergency Department Transfer Communications (EDTC) (Table 10) and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores (Table 11).

The lack of significant differences is important to consider. The goal for Emergency Department Transfer Communications (EDTC) is for 100% of transferred patients to have all nursing information communicated to receiving hospital. The goal for Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores is to achieve a high score on the Likert scale results. In each of these nurse-sensitive outcome areas, the lack of significant differences between North Dakota and Other States is showing that achievement of these goals may not be related to differences in hospital state location. A study of the relationship between

nurse leader influence scores and Emergency Department Transfer Communications (EDTC) and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores is recommended, but is beyond the reach of this study.

Conclusions

The demographic data show that the majority of nursing leaders have been part of their communities for more than 20 years, and the median age is 48 years. Not only do nursing leaders have longevity in their communities, the majority also have been part of their hospital for more than 10 years. However, the majority have been in their leadership roles for less than 5 years.

Ethnicity, gender, and Hispanic/Latinx status show homogeneity across the sample, with over 90% of the participants identifying as Caucasian, female, and non-Hispanic/Latinx. These findings were predicted to occur in North Dakota by the Center for Rural Health, which maintains a strong relationship with nursing leaders across all critical access hospitals in North Dakota.

The education levels of critical access hospital nursing leaders is lower than the education levels found in a study of urban and suburban hospitals. This study found that 58.33% of nurse leaders had an educational level of baccalaureate or associate degree, whereas Adams, Djukic, Gregas and Fryer (2018), in a study of urban and suburban nursing leaders, found no leaders with an associate degree and 35% with a baccalaureate. This lower level of education in critical access hospitals is consistent with the literature in that generally professionals in rural settings have less access to higher levels of education due to distance and available resources (Bish, Kenny & Nay, 2012; Hauenstein, Glick, Kane, Kulbok, Barbero, & Cox, 2014; Newhouse, Morlock, Pronovost & Sproat, 2011; Skillman, Palazzo, Keepnews, & Hart, 2006; Warren & Smalley, 2014).

Nurse Leader Influence. The results of this analysis are particularly exciting. Analysis revealed all categories of the Leadership Influence over the Professional Practice Environment Scale (LIPPES) scored lower, to some degree, in North Dakota than in other states. However, statistical significance of these lower scores in North Dakota as compared to other states were found in the three subcategories of Collegial Administrative Approach, Access to Resources, and Internal Strategy and Resolve, and in the Overall Leadership Influence over the Professional Practice Environment Scale score (Table 9). Differences were not statistically significant for subcategories of Authority, Leadership Expectations, and Status (Tables 10 and 11). The specific aspects of these findings are discussed below and conclusions are related back to the literature.

In this study, there was a higher response rate in North Dakota (77.78%) as compared to other states (9.17%), which presents an interesting possibility. It is possible that this response rate difference is a factor in the significantly lower nurse leader Overall Influence score and subcategory scores of Collegial Administrative Approach, Access to Resources, and Internal Strategy and Resolve. For instance, a nursing leader who is feeling overwhelmed may feel less able to take the time to fill out a survey request. Similarly, such a leader may also have differences in how they are able to influence the professional practice work environment. This warrants further investigation.

Collegial administrative approach. The Leadership Influence over Professional Practice Environments Scale subcategory of “Collegial Administrative Approach” measured the nurse leaders’ perceptions of their ability to create trusting and positive relationships. This category consisted of thirteen questions designed to elicit the extent of relationship-based leadership style as compared to a hierarchical leadership style (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013). Long and Weinert’s (1989) rural nursing theory identified that the inherent nature

of relationship-based interactions in the professional practice work environment is a defining characteristic of a difference in small rural hospital settings. Similarly, Bish, Kenny and Nay (2012) identify that partnering within rural healthcare systems as a well-developed theme in rural nursing leadership research. Supporting nursing leaders in critical access hospitals, especially in North Dakota, in methods to develop trusting and positive relationships may be a focus area based on the results of this study.

Internal strategy and resolve, access to resources, and overall influences. Three further Leadership Influence over Professional Practice Environments Scale (LIPPES) category scores were found to be significantly lower in North Dakota as compared to other participating states. These were Internal Strategy and Resolve, Access to Resources, and the Leadership Influence over Professional Practice Environments Scale Overall scores.

Internal Strategy and Resolve is operationally defined as “self-determining characteristics, fortitude, and planning” (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013, p. 263). These characteristics strongly relate to the concepts of self-reliance and independence in rural populations (Long & Weinert, 1989).

Access to Resources is defined as “the ability to garner necessary information, workforce support, finances, capital goods, or other assets” (Adams, Nikolaev, Ives Erickson, Ditomassi & Jones, 2013, p. 264). This is also strongly related to rural nursing settings with regards to professional isolation (Williams, 2012), ability to support professional development (Nelson-Brantley, Ford, Miller & Bott, 2018), and highly educated human resources (Bish, Kenny & Nay, 2012; Hauenstein, Glick, Kane, et. al., 2014; ; Nelson-Brantley, Ford, Miller & Bott, 2018; Newhouse, Morlock, Pronovost and Sproat, 2011; Skillman, Palazzo, Keepnews, & Hart, 2006; Warren & Smalley, 2014).

The third category, Leadership Influence over Professional Practice Environments Scale Overall scores, is the average across all subcategories measured in the Leadership Influence over Professional Practice Environments Scale, including collegial administrative approach, internal strategy and resolve, authority, access to resources, leadership expectations, and status (Adams & Natarajan, 2016).

Each of these areas have relationships to the small rural hospital environment, as described in Chapter 2. It is important for practicing nurse leaders in critical access hospitals in North Dakota to understand that Internal Strategy and Resolve, Access to Resources, and the Leadership Influence over Professional Practice Environments Scale Overall scores all relate to the influence the leader has over the professional practice environment, which has been shown to be related to outcomes for patients in their hospitals (Adams, Ives Erickson, Jones & Paulo, 2009). Therefore, the leaders' work to maintain or improve these leadership characteristics may be directly related to improved outcomes for patients in their hospitals.

Nurse-Sensitive Outcomes. No significant differences were found between North Dakota and other states in relation to Emergency Department Transfer Communications (EDTC) and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS).

The lack of significant differences is interesting in this case. Although there were significant differences between the two groups of critical access hospital nursing leaders in relation to leadership influence characteristics, the lack of differences in nurse-sensitive outcome data warrants further research into potential relationships, or lack thereof, between nursing leader influence characteristics and nurse-sensitive outcomes. A correlational study is recommended.

Strengths and Limitations

Design

Although the comparative design of this study is one that has been used and tested in innumerable studies, it is not without limitations (Azarian, 2011). Strengths of this comparative study design include the ability to view differences between two independent groups of small sample sizes and make inferences based on those comparisons (Laerd Statistics, 2015). However, a limitation of this design is the ability to make inferences to populations that are so geographically widespread that cultural differences may not be able to be understood by the researcher (Azarian, 2011). For instance, the methods of influence that a critical access hospital nurse leader uses in Hawaii may be very different, or cause different outcomes, from those used by such leaders in North Dakota. Studies limited to large portions of the population in culturally similar regions of the United States may inform practice at a more culturally informative level.

While this study is limited to nursing leadership in critical access hospitals, it should be noted that there are many other rural hospitals and healthcare settings in addition to critical access hospitals. However, the variability in definitions of rurality, together with differences in reimbursement rates between critical access hospitals and non-critical access hospitals, makes comparison of all rural hospitals problematic, prompting limitation to critical access hospital environments. Further study of the greater rural healthcare system is warranted.

Methods

The methods in this study are strengthened by the use of the reliable and validated Leadership Influence over Professional Practice Environments Scale tool. Response bias is addressed through use of the web-based Leadership Influence over Professional Practice Environments Scale tool to remove interview-related bias from responses. However, there is a

risk of response bias due to non-responders and the unknown reasons behind their non-response. They may not respond due to feeling overworked, worry regarding poor outcomes, lack of trust in the anonymity of the study, and resulting concern about their own reputation in their rural community.

A limitation in this study was the difference in rates of response in North Dakota as compared to other participating states. Contributing factors may have been differences in compensation offered to participants, and methods of contacting participants. Participants in North Dakota were each given an incentive gift of a ten-dollar gift card while participants in other states were entered into a lottery for a fifty-dollar gift card. The difference in compensation rates was approved by the Institutional Review Board (IRB) at the University of North Dakota. As well, although participants in all states were solicited by email requests, phone calls were also placed to potential participants in North Dakota, as approved by the Institutional Review Board.

Another limitation in this study was the lack of access to critical access hospital nursing leaders. There is no known national database of contact information for critical access hospital nursing leaders. Some state Flex Monitoring Programs maintain contact lists, and some do not. Therefore access was dependent on the gatekeepers of contact lists and their ability to use their time and resources to assist this research.

Analysis

The use of t-tests for continuous variable analysis and ANOVA for categorical variable analysis is appropriate in this study to analyze comparative differences between the two groups of nursing leaders (Laerd Statistics, 2015; Polit and Beck, 2012; Tabachnick and Fidell, 2014). A limitation in this study is the unbalanced design. In particular, the two studied groups have different sample sizes, with the North Dakota group having 28 participants and other states

yielding 44 participants. However the effect of the unbalanced design is mitigated by addressing violations in the assumptions, which could have a greater negative effect in an unbalanced design (Laerd Statistics, 2015).

A limitation in the analysis relates to the different numbers of respondents in the varied states (Table 5). Each state had a different number of respondents in the study. And differences in external environments, socioeconomic status, and other confounding factors, may have had an effect on the data. For instance, if a set of respondents from a small number of states had very high or very low influence scores, then removal of those states from the analysis may change the significance of the differences between the remaining states and North Dakota. It is recommended that further studies incorporate a state by state analysis in the future.

Another limitation to this study is the presence of potentially confounding factors beyond the control of the researcher. This is an observational study, where it is recognized that the influence characteristics of the nursing leaders may be affected by environmental factors, such as the local socioeconomic status of the region or the resources available to the leaders. Therefore, further study is recommended to account for such factors.

Recommendations

Nursing Actions

This study was designed as a precursor to build the case for larger future correlational studies designed to elicit recommendations for changes in nurse leader practice, support, and education. Even so, the high participation rate of critical access hospital nurse leaders in North Dakota, representing 77.78% of the critical access hospitals in the state, may provide a case for the results of this study to be applicable to the population of critical access hospital nursing leaders in North Dakota. In this case, recommendations for this population, based on the findings

of this study, include a nursing leadership focus on relationship-based leadership styles and how they may be used to create a collegial work environment. As well, a focus on improving internal strategy and resolve of critical access hospital nurse leaders in North Dakota is a recommendation. Note that this recommendation is not meant to imply a causal relationship between outcomes and nursing leadership style. As previously stated, leadership style may be affected by outcomes, rather than the opposite, as shown in the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives (Figure 2). Nevertheless, leadership style is controllable by the leader. Thus, leadership style would be a starting point for change in outcomes.

Future Research

The results of this research may enable future larger correlational studies of nurse leader influence compared to nurse-sensitive outcomes in critical access hospitals in the United States. The hope for this future program of research is to inform the state of the science related to relationships among leadership, environments and outcomes for nurse executives (Adams, Ives Erickson, Jones & Paulo, 2009) (Figure 2) within rural hospitals. A continued program of research is recommended to investigate the relationships among critical access hospital nurse leadership influence compared to nurse-sensitive indicators of quality at the national level. It is recommended that a new study be designed to identify support needs of rural nursing leaders in an effort to positively influence outcomes in rural settings. Although numerous studies have shown improved patient outcomes due to professional development of frontline nursing staff (Aiken et. al., 2011; Bushy, 2005; Institute of Medicine [IOM], 2010; Skillman, Palazzo, Keepnews, & Hart, 2006; Van den Heede, Lesaffre, Diya, Vleugels, Clarke, Aiken & Sermeus, 2009), similar research is lacking in regards to nursing leadership support. An interventional

study to explore the Model of the Interrelationship of Leadership, Environments, and Outcomes for Nurse Executives as a whole is recommended as a future step in this program of research.

Future research is recommended to conduct a correlational study using the estimated effect sizes found in this study. This study was designed to compare results across states and assess the feasibility of future research in the area of nursing leadership and patient and organizational outcomes in small rural hospitals, such as critical access hospitals. The estimated effect sizes found in this feasibility study may be used to design future research using the Leadership Influence on the Professional Practice Environment Scale (LIPPES) in the rural hospital setting. Due to the difficulty encountered by rural nursing leaders in easily accessing data related to Emergency Department Transfer Communications and Hospital Consumer Assessment of Healthcare Providers and Systems, it is suggested for future studies to obtain permissions to access this information directly from the agencies to which it is reported.

Conclusions

Nursing leaders in critical access hospitals in North Dakota have the potential to influence positive patient and organizational outcomes in their hospitals and regions. However, a lack of fundamental research in this area leads to a lack of information regarding which characteristics of leadership influence have the most potential to improve patient and organizational outcomes. This study found significant differences among nursing leadership characteristics' overall scores and sub-scores of collegial administrative approach, internal strategy and resolve, and access to resources when comparing critical access hospital nurse leaders in North Dakota to those in other states. Interestingly, these findings were different from findings in a recent study conducted in academic and community hospital settings (Adams, Djukic, Gregas, & Fryer, 2018), which found that authority and leadership expectations of staff

were strongly related to patient outcomes. The differences found among this feasibility study in critical access hospitals and the larger non-rural study (Adams, Djukic, Gregas, & Fryer, 2018) highlight the importance of conducting large investigations in small rural hospital settings, as the inherent nature of rural nursing leadership may show differences in how nursing leaders influence positive outcomes for patients and facilities. Ultimately, such future research may have an impact on the disparities found among rural, suburban, and urban populations in the United States.

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HCAHPS Survey

SURVEY INSTRUCTIONS

- ◆ You should only fill out this survey if you were the patient during the hospital stay named in the cover letter. Do not fill out this survey if you were not the patient.
- ◆ Answer all the questions by checking the box to the left of your answer.
- ◆ You are sometimes told to skip over some questions in this survey. When this happens you will see an arrow with a note that tells you what question to answer next, like this:
 - Yes
 - No → **If No, Go to Question 1**

You may notice a number on the survey. This number is used to let us know if you returned your survey so we don't have to send you reminders.
Please note: Questions 1-25 in this survey are part of a national initiative to measure the quality of care in hospitals. OMB #0938-0981

Please answer the questions in this survey about your stay at the hospital named on the cover letter. Do not include any other hospital stays in your answers.

YOUR CARE FROM NURSES

1. During this hospital stay, how often did nurses treat you with courtesy and respect?
 - 1 Never
 - 2 Sometimes
 - 3 Usually
 - 4 Always
2. During this hospital stay, how often did nurses listen carefully to you?
 - 1 Never
 - 2 Sometimes
 - 3 Usually
 - 4 Always

3. During this hospital stay, how often did nurses explain things in a way you could understand?
 - 1 Never
 - 2 Sometimes
 - 3 Usually
 - 4 Always
4. During this hospital stay, after you pressed the call button, how often did you get help as soon as you wanted it?
 - 1 Never
 - 2 Sometimes
 - 3 Usually
 - 4 Always
 - 9 I never pressed the call button

YOUR CARE FROM DOCTORS

5. During this hospital stay, how often did doctors treat you with courtesy and respect?

- ¹ Never
² Sometimes
³ Usually
⁴ Always

6. During this hospital stay, how often did doctors listen carefully to you?

- ¹ Never
² Sometimes
³ Usually
⁴ Always

7. During this hospital stay, how often did doctors explain things in a way you could understand?

- ¹ Never
² Sometimes
³ Usually
⁴ Always

THE HOSPITAL ENVIRONMENT

8. During this hospital stay, how often were your room and bathroom kept clean?

- ¹ Never
² Sometimes
³ Usually
⁴ Always

9. During this hospital stay, how often was the area around your room quiet at night?

- ¹ Never
² Sometimes
³ Usually
⁴ Always

YOUR EXPERIENCES IN THIS HOSPITAL

10. During this hospital stay, did you need help from nurses or other hospital staff in getting to the bathroom or in using a bedpan?

- ¹ Yes
² No → If No, Go to Question 12

11. How often did you get help in getting to the bathroom or in using a bedpan as soon as you wanted?

- ¹ Never
² Sometimes
³ Usually
⁴ Always

12. During this hospital stay, did you have any pain?

- ¹ Yes
² No → If No, Go to Question 15

13. During this hospital stay, how often did hospital staff talk with you about how much pain you had?

- ¹ Never
² Sometimes
³ Usually
⁴ Always

14. During this hospital stay, how often did hospital staff talk with you about how to treat your pain?

- ¹ Never
² Sometimes
³ Usually
⁴ Always

15. During this hospital stay, were you given any medicine that you had not taken before?

¹ Yes

² No → If No, Go to Question 18

16. Before giving you any new medicine, how often did hospital staff tell you what the medicine was for?

¹ Never

² Sometimes

³ Usually

⁴ Always

17. Before giving you any new medicine, how often did hospital staff describe possible side effects in a way you could understand?

¹ Never

² Sometimes

³ Usually

⁴ Always

WHEN YOU LEFT THE HOSPITAL

18. After you left the hospital, did you go directly to your own home, to someone else's home, or to another health facility?

¹ Own home

² Someone else's home

³ Another health facility → If Another, Go to Question 21

19. During this hospital stay, did doctors, nurses or other hospital staff talk with you about whether you would have the help you needed when you left the hospital?

¹ Yes

² No

20. During this hospital stay, did you get information in writing about what symptoms or health problems to look out for after you left the hospital?

¹ Yes

² No

OVERALL RATING OF HOSPITAL

Please answer the following questions about your stay at the hospital named on the cover letter. Do not include any other hospital stays in your answers.

21. Using any number from 0 to 10, where 0 is the worst hospital possible and 10 is the best hospital possible, what number would you use to rate this hospital during your stay?

⁰ 0 Worst hospital possible

¹ 1

² 2

³ 3

⁴ 4

⁵ 5

⁶ 6

⁷ 7

⁸ 8

⁹ 9

¹⁰ 10 Best hospital possible

22. **Would you recommend this hospital to your friends and family?**

- Definitely no
- Probably no
- Probably yes
- Definitely yes

UNDERSTANDING YOUR CARE WHEN YOU LEFT THE HOSPITAL

23. **During this hospital stay, staff took my preferences and those of my family or caregiver into account in deciding what my health care needs would be when I left.**

- Strongly disagree
- Disagree
- Agree
- Strongly agree

24. **When I left the hospital, I had a good understanding of the things I was responsible for in managing my health.**

- Strongly disagree
- Disagree
- Agree
- Strongly agree

25. **When I left the hospital, I clearly understood the purpose for taking each of my medications.**

- Strongly disagree
- Disagree
- Agree
- Strongly agree
- I was not given any medication when I left the hospital

ABOUT YOU

There are only a few remaining items left.

26. **During this hospital stay, were you admitted to this hospital through the Emergency Room?**

- Yes
- No

27. **In general, how would you rate your overall health?**

- Excellent
- Very good
- Good
- Fair
- Poor

28. **In general, how would you rate your overall mental or emotional health?**

- Excellent
- Very good
- Good
- Fair
- Poor

29. **What is the highest grade or level of school that you have completed?**

- 8th grade or less
- Some high school, but did not graduate
- High school graduate or GED
- Some college or 2-year degree
- 4-year college graduate
- More than 4-year college degree

30. Are you of Spanish, Hispanic or Latino origin or descent?

- ¹ No, not Spanish/Hispanic/Latino
- ² Yes, Puerto Rican
- ³ Yes, Mexican, Mexican American, Chicano
- ⁴ Yes, Cuban
- ⁵ Yes, other Spanish/Hispanic/Latino

31. What is your race? Please choose one or more.

- ¹ White
- ² Black or African American
- ³ Asian
- ⁴ Native Hawaiian or other Pacific Islander
- ⁵ American Indian or Alaska Native

32. What language do you mainly speak at home?

- ¹ English
- ² Spanish
- ³ Chinese
- ⁴ Russian
- ⁵ Vietnamese
- ⁶ Portuguese
- ⁹ Some other language (please print):

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Appendix B – Literature Search Database Listing

Database	Professional Fields	Journal/Record Count	Hit Count
Academic Search Premier	Biology, chemistry, engineering, physics, psychology, religion and philosophy, science and technology, veterinary science	4600 journals	32
Alt Health Watch	Complementary health care	180 journals	0
America: History & Life	History and culture of the US and Canada	1700 journals	0
Anthropology Plus	Anthropology, archaeology, art history, demography, economics, ethnology, folklore, human ecology, linguistics, linguistics and literature, material culture, museum studies, primatology, psychology, religious studies, sociological anthropology	700+ journals	0
Art Full Text (H.W. Wilson)	Advertising art, antiques, archaeology, architecture and architectural history, art history, computers in art, crafts, decorative arts, fashion design, folk art, graphic arts, industrial design, interior design, landscape architecture, motion pictures, museology, non-western art, painting, photography, pottery, sculpture, television, textiles, video.	280 publications	0
ATLA Religion Database with ATLASerials	Archaeology & antiquities, Bible, church history, human culture & society, missions & ecumenism, pastoral ministry, philosophy & ethics, religious studies, theology, and world religions	1746 journals	0
Biological Abstracts	Life science and biomedical research	4300 journals	0
Business Source Complete	Business	1300 journals	11
Business Source Premier	Business	2300 journals	11
CINAHL with Full Text	Nursing & allied health	610 journals	0
Consumer Health Complete - EBSCOhost	Consumer-oriented health	391 journals	13
Criminal Justice Abstracts	Criminal justice	400,000 records	1
EBSCO MegaFILE	Multidisciplinary	19,100 journals	34
ERIC	Education	1070 journals	1

Database	Professional Fields	Journal/Record Count	Hit Count
GreenFILE	Global climate change, green building, pollution, sustainable agriculture, renewable energy, recycling	298 journals	0
Health Source - Consumer Edition	Consumer health	80 journals	0
Health Source: Nursing/Academic Edition	Health disciplines	550 journals	14
Inspec	Engineering and technology	5000 journals	0
Library, Information Science & Technology Abstracts	Librarianship	175 journals	0
MasterFILE Premier	Multi-disciplinary	1700 journals	4
MEDLINE Plus	Biomedical and health	5400 journals	0
MLA Directory of Periodicals	Language & literature	5000 periodicals	0
MLA International Bibliography	Language & literature	4400 periodicals	0
Professional Development Collection	Education	520 journals	6
PsycARTICLES	Psychology	80 journals	0
PsycINFO	Psychology	2500 journals	0
RILM Abstracts of Music Literature (1967 to Present)	Music	620,000 records	0
Science Reference Center	Biology, chemistry, earth & space science, environmental science, health & medicine, history of science, life science, physics, science & society, science as inquiry, scientists, technology and wildlife.	640 journals	0
SocINDEX with Full Text	Sociology	860 journals	5

Database	Professional Fields	Journal/Record Count	Hit Count
SPORTDiscus	Sport, physical fitness, exercise, sports medicine, physical education, kinesiology, training, disabled persons, drugs, health, health education, biomechanics, movement science, injury prevention rehabilitation, physical therapy, rehabilitation, nutrition, exercise physiology, sport & exercise psychology, occupational health & therapy, public health and more	2.2 million records	0
Teacher Reference Center	Teaching and educational administration	280 journals	4

Appendix C: Permission to Use the Leadership Influence over Professional Practice

Environments Scale



Ms. Jennifer Eccles
Doctoral Student – University of North Dakota
jennifer.eccles@und.edu

April 3, 2018

Dear Ms. Eccles:

This correspondence is to grant you permission to use the Leadership Influence over Professional Practice Environments Scale (LIPPES) for your dissertation work. The questions/ items and/or subscale groupings are not to be publicly shared/ published. I ask that you share with me your findings and wish you the best in your dissertation work.

Warmest Regards,

A handwritten signature in black ink, appearing to read "Jeffrey M. Adams", is written over a light gray circular watermark.

Jeffrey M. Adams, PhD, RN, NEA-BC, FAAN