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# Staffing Model to Improve Patient Outcomes in an Acute Inpatient Rehabilitation Facility

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# Walden University

College of Health Sciences

This is to certify that the doctoral study by

Ann Marie Evans

has been found to be complete and satisfactory in all respects,  
and that any and all revisions required by  
the review committee have been made.

Review Committee

Dr. Cynthia Fletcher, Committee Chairperson, Nursing Faculty

Dr. Marisa Wilson, Committee Member, Nursing Faculty

Dr. Karen Robson, University Reviewer, Nursing Faculty

Chief Academic Officer

Eric Riedel, Ph.D.

Walden University

2017

Abstract

Staffing Model to Improve Patient Outcomes in an Acute Inpatient Rehabilitation Facility

by

Ann Marie Evans

MSN, Walden University, 2011

BSN, Marshall University, 2001

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

November 2017

## Abstract

The goal of the acute inpatient rehabilitation facility (IRF) is to rehabilitate patients and discharge them back into the community at their optimal level of functioning. The IRF patient is more acutely ill today than in the past, and due to a change in condition may be discharged back into the acute care hospital before achieving maximal level of function. An IRF was identified as discharging 14% of patients back into acute care, which indicated the IRF was not meeting its treatment goals. A chart review revealed a possible link between the nurse's role in patient care and the patient's discharge disposition. The purpose of this project was to design a nurse staffing care model that would support the registered nurse in providing care and treatment for the IRF patient. The missed nursing care model and Lewin's change theory were used to support the design of the new staffing model. Sources of evidence included a literature review of nurse staffing models and the nurse's role in patient outcomes. A project team of expert stakeholders participated in the development of the new model. The Appraisal of Guidelines for Research and Evaluation was used in formative and summative evaluations of the new model to systematically assess the quality of the new staffing model. Formative feedback was given by 3 project team members. Nine expert end users provided summative evaluations of the new model after revisions by the project team. All end users recommended implementation without modification. Positive social change with implementation of this model may lead to reduced acute care transfers, improved quality measures, and enhanced patient outcomes in the IRF.

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## Acknowledgments

First and foremost, I thank my almighty God for carrying me through this process. Without Him, I would have never achieved my goal of becoming a doctorate-prepared nurse. I thank my husband, Randy, and our children, Brianna, Christopher, and Jarod, for your love and encouragement to fulfill my dreams. Special thanks to my sister, Ava, for always being there for me when I became discouraged and for never failing to pick me up, dust me off, and tell me to keep on going. To my parents and the rest of my loving family and friends, I remain indebted to you for your constant love and support. Finally, I thank Dr. Cynthia Fletcher and Dr. Marisa Wilson for your guidance in completing this project.

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## Section 1: Nature of the Project

Inpatient rehabilitation facilities (IRFs) provide intensive therapy services and nursing care to patients who need to regain functioning after suffering a stroke, hip fracture, spinal cord injury, and other debilitating illness. Typical IRF patients consisted of those recovering from an uncomplicated orthopedic replacement. However, the situation has changed as Medicare admission criteria have evolved to include acutely ill patients with multiple comorbidities. The staffing skill model within an IRF must be adjusted to meet the needs of the current patient acuity to achieve quality patient outcomes.

An IRF exists in a rural Appalachian region and obtains at least 90% of patient admissions from neighboring acute care hospitals. These patients must meet the specific Medicare criteria for admission and be able to complete 15 hours of therapy per week to fulfill their rehabilitation treatment goals. A major barrier in meeting these intense therapy goals occurs when a patient becomes acutely ill in the IRF setting and is admitted back into the acute care hospital for treatment. This is called an acute care transfer (ACT).

A patient's decline in condition must be recognized and treated to prevent an ACT, which affects the rehab patient's success in completing the rehab program. Additionally, ACTs are costly to the organization in that IRFs are reimbursed an average of \$1192 per patient day, and this revenue is lost on patients who are discharged to acute care for treatment. For example, the average length of stay for an IRF patient is 9 days, and at \$1192 per day, each patient brings in approximately \$10,728 per stay. An ACT

results in a financial loss of approximately \$3000 per case. Revenue may be gained with a new staffing model designed to meet the needs of acutely ill patients.

IRF nurse leaders, including the director of nursing, nurse manager, and nurse supervisor, are ultimately responsible for staffing the nursing unit in the IRF. However, multiple internal and external variables determine the type of staffing model a nurse leader chooses to implement. External variables may include the current economic circumstances, local registered nurse (RN) shortages, nursing school capacities, increase in health care competitors, and changing patient needs or expectations (Nurse Service Organization, n.d.). Internal variables may include the level of experience of the nursing staff, the administration's beliefs on nursing skill mix, and administrators' level of insight into the nursing unit's needs.

The staffing model at the project site IRF includes RNs, licensed practical nurses (LPNs), and unlicensed patient care technicians. There are two shifts per day divided equally into 12 hours. RNs are typically assigned as team leaders. The role of the team leader is to perform a detailed nursing assessment of each of the assigned patients, pass medications, and perform nursing interventions guided by the patient's plan of care. However, not all RN staff members are assigned as team leaders and do not conduct nursing assessments. Sometimes the RNs are assigned to function as patient care technicians instead of team leaders, and they assume the responsibility and mentality of the tech without regard to their nursing profession. Patient care technicians are hired to support the nursing staff and assist patients with activities of daily living. Patient care

technicians are assigned approximately seven or eight patients each while the RN typically cares for 10 to 15 patients each.

The ACT rate for this IRF continues to exceed the target goal of 10% or less (Appendix A). There may be a link to a lack of direct RN assessment as evidenced by a chart review of the hospital's ACTs that revealed conflicting nursing assessments between shifts, lack of documentation of patient decline, and inconsistent documentation of symptom management. A 6-month chart review of 66 patient records indicated that respiratory issues, hospital-acquired infections, medication reactions, and falls were the top adverse events that contributed to the ACT rate in this IRF.

ACT rates have been a problem at this facility for several years. Frith et al. (2010) asserted that a direct correlation exists between RN care hours and patient outcomes. Frith et al. found that a higher number of RN care hours per patient day are associated with a reduced number of adverse patient events and shorter lengths of stay. However, this study took place in an acute care setting. Staggs, Knight, and Dunton (2012) found that RN tenure is associated with patient outcomes, such as unassisted fall rates, and may be contributed to the level of teamwork on a unit. The purpose of this project was to design a new staffing model to ensure RNs are able to use their knowledge and skills for designing patient care in producing positive patient outcomes. This new model may decrease the number of ACTs in this facility.

### **Problem Statement**

Respiratory issues, hospital-acquired infections, medication reactions, and falls are the top reasons patients are being discharged from the IRF back to acute care. The

facility remains above the national benchmark for ACTs. The financial impact is approximately a 1.4 million decrease in annual revenue (Appendix B). A chart review revealed that signs and symptoms were missed during nursing assessments of the patients who were discharged as ACTs. Rehab facilities have not kept up with the monitoring required for these patients, and change is needed. Currently, two RNs per day are used solely as admissions nurses, and they are not assigned as team leaders. RNs are also being relegated to patient care technicians instead of being assigned to assess patients. The current staffing model does not allow nurses to function in their highest capacity; therefore, important assessment of subtle changes in the patient's condition often goes unrecognized. A new staffing model that will encourage RNs to function in their highest capacity in primary care roles may lead to improved symptom identification and management and a reduction in ACTs.

### **Purpose**

Most nursing staff working in IRFs are primarily focused on rehabilitation; however, patients are now being admitted in a less stable state, which requires more intensive nurse monitoring and care planning. It is evident this is not occurring given the high ACT rate in the project site facility. The ACT cumulative rate currently exceeds 14%. This high ACT rate has a detrimental effect on IRF patient outcomes and length of stay as well as the financial bottom line. The purpose of this project was to develop a new staffing model for the IRF's nursing care unit that was more focused on how the nurses function. This new model incorporated nursing education for the care nurses need to provide. The changes may result in decreasing the ACT rate and improving patient

outcomes. Based on the literature, nurse staffing models impact patient outcomes, which is why this change was implemented (Bae, Kelly, Brewer, & Spencer, 2014).

The gap in practice was patients are being discharged from acute care earlier than in previous years. A review of the literature included evidence-based practice that was incorporated in the new model to ensure patients are successfully rehabilitated. A practice change included the type of nursing care that is required for the acutely ill rehab patient. Nursing administrators will be educated on using RNs to manage patient care. The new model also included a staffing ratio that will allow the RN to function at a higher level to improve patient outcomes. Rehab nurses will need to be educated and reoriented to the process of caring for acutely ill patients, including the development of a comprehensive plan of care. The goal of this project was to design a new staffing model to ensure RNs have the opportunity to use their knowledge and skills in designing patient care to produce positive outcomes for patients and substantially decrease the ACTs in this facility. RNs may positively impact patient outcomes by providing more thorough assessment, recognition, and intervention for subtle changes that, if not treated, will lead to an ACT.

#### **Nature of the Doctoral Project**

Results of a needs assessment indicated reducing the high ACT rate as a priority for the facility to improve patient outcomes. Collection of data and precipitating events was completed to identify the gap in nursing practice as a cause of the high ACT rate. The facility's high number of ACTs resulted in poor outcomes for patients in the IRF. Because RN staffing was identified as a significant source of impact on patient outcomes,

evidence was collected to support the need for a new staffing model in this IRF. A literature review was completed to explore the impact of RN staffing models on patient outcomes. Electronic searches of the Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, Science Direct, and Google Scholar were performed to find evidence to support this project. In addition to staffing models, evidence-based nursing practice guidelines were researched to determine the protocols needed to supplement the staffing design for the new model. A Google search was also performed to find evidence for these protocols. Very little evidence was found on nurse staffing models specific to the IRF setting. An IRF that consistently meets the benchmark for ACT rates was located, and its staffing model consisted of all RNs functioning as team leaders. Each RN is assigned four to five patients, and RNs are responsible for assessing and developing care plans for each of their patients. A similar model implemented in the project site IRF may result in improved patient outcomes, including the patient experiencing decreased preventable sentinel events, more successful rehabilitation, and higher rates of discharge back into the community. Published outcomes and precedents at successful IRFs were used to develop a new staffing model for the project site IRF.

The new staffing model, including a higher RN-to-patient staffing ratio and specific patient care protocols related to prevention of sentinel events, was expected to reduce the ACT rate at the project site. The IRF experiences a significant loss of revenue on patients who fail to complete their rehab program, most often from exacerbation of respiratory issues. Each Medicare payer source brings the IRF approximately \$1,200 in revenue per patient day, depending on the patient's goal achievement of meeting therapy

intensity and acquiring a gain in functional independence. This money is lost when the patient is unable to complete his or her program due to being admitted back into an acute care hospital. In addition, if the patient is transferred to acute care and returned to the IRF within 3 days, the IRF is responsible for the patient's acute care bill. In the first quarter of 2014, approximately \$150,000 was lost because of acute care readmissions (Chief Financial Officer, personal communication, September 30, 2014). In addition, if the patient is uninsured, hospital bills may go unpaid and may be written off as bad debt.

### **Significance**

Primary stakeholders included the patients who are being readmitted back into acute care because they are not being successfully rehabilitated. The project site IRF was also a stakeholder because it is losing money from of the ACTs. A substantial increase in revenue will occur with the reduction in ACTs. Nurse staffing, specifically the number of RNs per patient per shift, will improve from this project because the new staffing model will include more RNs for patient management. A needs assessment was completed to identify the gaps in practice, the IRF's needs, and the stakeholders' needs. Potential contributions from this project specific to nursing practice included enhanced nurse education on assessment, treatment planning, and patient outcomes monitoring. Furthermore, this project encouraged nurse administrators to transform a nurse staffing model as a quality improvement initiative.

Multiple studies provided evidence to support the positive correlation between RN staffing and patient outcomes. This evidence includes RN skill mix, nurse staffing levels, and the impact of using temporary nursing staff (Bae, Kelly, Brewer, & Spencer,

2014). A retrospective study of the staffing data from three adult tertiary hospitals indicated an increase in nursing skill mix was related to a decrease in the incidence of pressure ulcers, pneumonia, deep vein thrombosis, ulcers, upper gastrointestinal bleeds, sepsis, shock/cardiac arrest, mortality, and failure to rescue, which are all considered nurse-sensitive outcomes (Twigg, Duffield, Bremner, Rapley, & Finn, 2012). The Agency for Healthcare Research and Quality (as cited in Stanton, 2004) found an increase in poor patient outcomes including pneumonia, shock, cardiac arrest, and urinary tract infections among hospitals with lower nurse staffing levels. Bae et al. found a greater incidence of patient falls among nursing units using temporary RN staff; however, there was no correlation between temporary RN staff and pressure ulcer incidence for these same units.

Patients discharged from acute care are being discharged earlier than in previous years. Most patients admitted to the project site IRF suffer from additional comorbidities such as chronic obstructive pulmonary disease (COPD), diabetes, chronic kidney disease, and cardiovascular disease. Respiratory distress caused by COPD, heart failure, or pneumonia is the leading cause of ACTs in this facility. Most patients admitted to this IRF are 73 years or older. These patients fall under the following case mix groups: nontraumatic neurological disorders, stroke, other orthopedic disorders, fractures, miscellaneous, pulmonary, nontraumatic brain injuries, and cardiac disorders. Case management by an RN is needed to identify acute changes in the patient's condition and to develop and implement a comprehensive plan of care to prevent disease exacerbation. Findings from this doctoral project may be used to develop new staffing models and



improve patient outcomes in similar practice areas such as geriatric psychiatry units, long-term acute care units, and skilled nursing facilities.

### **Summary**

The project site IRF had a defined need to improve patient outcomes, including the number of patients successfully rehabilitated and discharged home, as evidenced by an ACT rate in excess of the target rate of 10% or less. Patient medical records were reviewed to identify the potential cause of the ACTs. Common themes noted during these chart reviews included a lack of consistent RN assessment, documentation, and care plan intervention. Staffing patterns for the IRF were reviewed and showed a low RN-to-patient ratio. Also, rehab RNs were not developing care plans for the management of acute disease processes. In addition, RNs were not being used to function at their highest level, and they were often assigned to perform in the patient care technician role. A new nurse staffing model including educational protocols for patient care management was needed to provide a positive impact on patient outcomes. Multiple studies indicated acute care hospitals with higher RN staffing models have lower rates of adverse patient outcomes. Because patients in the inpatient rehab setting are more acute than in the past, a new staffing model was designed to meet the needs of the IRF patient. Evidence supporting the relevance and need for a new staffing model, including local background and demographics, is explored in the next section of this project. The missed nursing care model is discussed as well as the role of Lewin's change theory in guiding this project.

## Section 2: Background and Context

The scholarly project process included the important steps of literature review, critique, and synthesis. Section 2 contains a review of the model, theory, and literature that supported the design of a new staffing model for the IRF. The literature review focuses on the significance of RN staffing and nursing skill mix in relation to patient outcomes in the inpatient setting. Most of this research is from acute care facilities because there are very few studies published on the effects of RN staffing for the IRF patient outcomes. Common themes exist among these studies related to the impact of nursing care on patient outcomes, regardless of the type of setting. Themes include patient acuity is higher than in the past, length of stay is significantly shorter than in the past, new technologies have created new challenges such as the widespread implementation of the electronic medical record, and a growing concern exists for the improvement of quality outcomes, patient safety, and health care costs.

In this section, I explore the need for a new nurse staffing model in the IRF by examining relevance to nursing practice, local background, and role of the DNP student. I also present evidence-based information to support the need for the new staffing model in improving patient outcomes and decreasing the incidence of ACTs in the IRF. Finally, this section informs the IRF's administrative team on how the current nurse staffing model contributes to missed nursing care, poor patient outcomes, and financial loss.

### **Conceptual Models and Theoretical Frameworks**

The conceptual framework used in this project was the missed nursing care model developed by Dr. Beatrice Kalisch in 2009, which has been used in previous studies to

support the impact of teamwork on missed nursing care, as well as studies regarding staffing and patient falls (Kalisch, Landstrom, & Hinshaw, 2009). According to this model, failing to complete nursing standards of care results in poor patient outcomes (Kalisch, Tschannen, & Lee, 2012). Missed nursing care is also referred to nursing care that is omitted, delayed, or not completed correctly (Kalisch et al., 2009).

Assumptions of this model include missed nursing care is a common threat across all countries, the model can be used to develop nursing interventions to impede missed nursing care, and the model serves a role in policy development for addressing missed nursing care (Kalisch et al., 2009). The elements of the model include structure variables, which are the characteristics of hospitals and patient units, and process variables, which are the actual nursing care processes (Kalisch et al., 2012). Structure variables for the current project included staffing levels and nursing skill mix. Skill mix is very important because one of the main roles of the RN is to assess patients for change in condition and provide the appropriate care to ensure positive outcomes for patients. Historically, the patient care technician was not required to have any prior health care experience before being hired, and often these personnel had never worked in a patient care setting or health care environment. Patient care technicians have no prior training to identify signs and symptoms of decline, and they have fewer patients to care for than the RN. At the project site, RNs have had to depend on patient care technicians to alert them of any patient changes. The process variables for this project were the missed nursing care factors such as thorough RN assessments and accurate interpretation of vital signs (see Kalisch et al., 2012). Some of the patient care technicians may not have had the knowledge to report

abnormal vital signs to the RN, and they may not have been trained to recognize changes in the patient's condition.

Other elements of the missed nursing care model include hospital and unit characteristics, such as patient acuity, nurse staffing, level of nurse education, skill mix, use of the nursing process, and the nurse's internal thought processes as contributing factors for the missed nursing care (Appendix C). The final element of the missed nursing care model is the outcome, and a primary advantage of using the missed nursing care model for this project was that it addressed both patient- and staff-related outcomes. Beyond the scope of this model, patient outcomes can be explored using ACT rates, and staff outcomes can be explored using measures of satisfaction with the new staffing model.

The missed nursing care model supported the reason for designing a new nurse staffing model; however, a framework was needed to support the organization's acceptance of the change in nurse staffing models. Lewin's change theory supported this element of the scholarly project (Appendix D). Lewin's change theory includes the stages of unfreezing, change, and refreezing (Nursing Theory, 2016). The purpose of the change theory is to identify the opposing and driving forces that either impede or promote change (Bozak, 2003). Using the theory, an organization can focus on the positive driving forces to facilitate the change (Bozak, 2003). This model has been used in health care organizations to successfully implement change, such as new nursing care models and new technology (Bozak, 2003).

According to Lewin's change theory, stakeholder resistance may be reduced by actively involving the staff in the planning and change process. In the unfreezing stage, the leaders and staff of the IRF will learn to let go of the current nurse staffing model, which is no longer effective in providing care for the acuity of today's IRF patient. The change will be the acceptance of the new nurse staffing model that will allow more RNs to provide direct care for patients, including a change in their role to function at their highest capacity. Refreezing will include the future state of consistently using the new staffing model in daily operations.

### **Relevance to Nursing Practice**

#### **Patient Outcomes in the Inpatient Rehabilitation Setting**

Patients who are successfully rehabilitated are expected to return to leading active, independent lives. This is the desired outcome for every IRF patient. Patients who become acutely ill and fail to complete their rehabilitation treatment fail to meet this outcome. Acute care transfers (ACTs) occur when a patient who is admitted to a rehabilitation hospital experiences a significant decline in his or her current condition or development of an acute medical condition and is unable to be treated within the IRF, which results in the patient returning to an acute care hospital for medical treatment. Examples include patients in need of ventilation support, blood transfusions, care for fall-related injuries, intensive monitoring for medication reactions, and treatment from complex infections such as septicemia. Frith et al. (2010) suggested that ample numbers of nurses combined with the appropriate nurse skill mix are needed to provide attentive

patient care, observation of clinical symptoms, and interventions to reduce the likelihood of an adverse event, which would be an ACT in the IRF setting.

### **Impact of Nursing Skill Mix on Inpatient Outcomes**

Nursing skill mix is the portion of nursing care hours provided by an RN expressed as a percentage (Frith et al., 2010). Skill mix can also be broken down into baccalaureate, associate, diploma, and licensed practical degrees as well as nurse certifications. Various strategies regarding skill mix have been implemented in the IRF to reduce ACT rates. One strategy was the addition of LPNs. Frith et al. (2010) conducted a cross-sectional retrospective study on the effects of RN and LPN percentages on adverse events and patient length of stay in four community hospitals. According to the results, RN skill mix was significantly related to the number of adverse patient events, whereas LPN skill mix did not have a significant impact (Frith et al., 2010). Furthermore, Frith et al. found that increasing the RN staffing by 5% would result in a 15.8% decrease in negative patient events. Frith et al. also found a significant, positive impact on decreasing length of stay when increasing both RNs and LPNs in the staffing mix; however, the LPN impact was less significant than that of the RN.

Hart and Davis (2011) conducted a study of 26 acute care nursing units looking at nurse staffing mix and patient outcomes over 24 months. Patient outcomes variables included codes, restraint use, medication occurrences, falls and falls with injury, and pressure ulcers. A significant correlation was found between higher RN hours and lower acquired pressure ulcers. According to Hart and Davis, nurse staffing models with lower patient-to-nurse ratios allowed nurses to spend more time on assessing patients and

performing nursing interventions, which resulted in more positive patient outcomes. Temporary RN nurse hours were also included in this study. There was no significant relationship found between agency RN hours and patient outcomes, except for a higher percentage of pressure ulcers on the medical-surgical units when compared with the critical care and telemetry units (Hart & Davis, 2011).

In a study on 30-day readmissions among 577 general hospitals, Stamp, Flanagan, Gregas, and Shindul-Rothschild (2013) found that higher levels of total RN nursing staff per patient day were a contributing factor in lower heart failure readmissions. However, Stamp et al. did not provide data on RN's effect on process of care, such as communication and responsiveness. Stamp et al. suggested exploring RNs' education and experience as factors in patient outcomes because adding more RNs into direct care in the IRF may not improve patient outcomes. Additional factors such as education and experience may need to be studied (Stamp et al., 2013).

Bae et al. (2014) concluded that health care organizations should not only focus on total nursing care hours, which include all nursing staff (licensed and unlicensed), but also on nurse skill mix, RN turnover, and the use of temporary staff. Bae et al. collected staffing and patient outcomes data from 35 nursing units among three hospitals to study the incidence of patient falls and pressure ulcers in association with nurse staffing. The most significant finding from this study was higher levels of temporary RN staffing resulted in an increased rate of patient falls and falls with injury. Bae et al. suggested there should be an emphasis on the quality of nursing care, not just on the level of nurse education, in regard to the impact on patient outcomes.

Mark et al. (2008) examined the relationship between organizational context, structure, patient characteristics, safety, and effectiveness in 143 hospitals and found rural hospitals were staffed with a lower proportion of RNs compared to urban hospitals. Higher numbers of RNs in the staffing model have been associated with fewer medication errors (Mark et al., 2008). This finding indicates that nurse education level must also be considered as a factor in staffing adequacy.

Frith et al. (2010) asserted that RN skill mix affects patient adverse events and length of stay in relation to the RN anticipating problems, discovering clinical signs and symptoms of change in condition, and implementing interventions to reduce these events. According to this study, the most frequent adverse event was a hospital-related injury such as patient fall (Frith et al., 2010). Frith et al. found that a 1% increase in RN staffing reduced adverse events by 3.4%, and concluded that hospitals should promote an increase in RN staffing to improve outcomes.

In a similar study, Staggs et al. (2012) explored 248 U.S. hospitals and characteristics of their 1504 nursing units, including nurse staffing variables, as predictors in patient fall rates. This study included 82 rehabilitation units. According to the results, the rehabilitation units experienced the highest rate of unassisted falls (Staggs et al., 2012). Findings showed that the effects of nurse skill mix and RN tenure on unassisted fall rates were moderate (Staggs et al., 2012). Furthermore, increasing the RN hours by one standard deviation (0.14) was associated with an estimated 4.0% average decrease in unassisted fall rates whereas an average increase of 2.8 years in RN tenure (1



standard deviation) was associated with a 2.3% decrease in the same fall rate (Staggs et al., 2012).

The most recent strategy implemented to reduce ACTs in the project site IRF was requiring a nursing supervisor to assess any patient who was identified as a possible ACT. One of the major problems with this strategy was lack of 24-hour nursing supervisor coverage. In addition, the patient may have displayed adverse symptoms for an entire shift or longer before a nursing supervisor was notified. Even with the implementation of this strategy, approximately 75% of the cases ended up being sent to acute care as a result of continuing decline and physicians insisting the patients be transferred out of the IRF for medical stability (Director of Quality, personal communication, August 10, 2016).

#### **Impact of Adverse Events on Patient Outcomes**

Acute care transfers occur in the rehabilitation setting for a variety of reasons, including patient falls. According to Titler, Shever, Kanak, Picone, and Qin (2011), inpatient falls are the main reason for adverse hospital events, occurring up to 13 times for every 1000 patient days. Findings from the exploratory outcomes study showed that increasing RN skill mix by 10% resulted in a significant decrease in patient fall rates (Titler et al., 2011). The “no fall” group in this study had a higher RN skill mix and more RN care hours when compared with the average number of RN care hours (Titler et al., 2011). Similar results were noted in a cross-sectional, descriptive study in which nursing hours per patient day were a significant predictor of patient falls, accounting for 13.0% of the variance for falls (Kalisch et al., 2012).

Hart and Davis (2011) conducted a retrospective, correlational study in which nursing implications for reducing these events included an appropriate orientation program and continuing education for nurses. The RNs were required to complete an extensive orientation program in the rehab environment, which included education on clinical assessment and reassessment of the rehab patient. The RNs were required to participate in continuing education to maintain their state RN licensure. Nurses participate in continuing education to remain competent and learn about new interventions for patient care. Studies have indicated that nursing care interventions, such as providing patient education and effective pain management, lead to higher quality outcomes (Hall, Wodchis, Xiaomu, & Johnson, 2012). Nurses may have more time to complete these interventions when a higher RN skill mix is provided for each shift.

There was an abundance of evidence-based literature on the relationship between nurse staffing and patient outcomes (Frith et al., 2010). Studies have indicated a correlation exists between increased patient mortality from complications and lower nurse staffing levels (Talsma et al., 2014). However, there were studies which did not support this concept. Talsma et al. (2014) conducted a 3-year study in multiple sites; mainly general care units and some intensive care units. Nurse staffing levels were obtained from each unit and included total nursing hours per patient day, RN hours per patient day, and RN staffing mix. The nurse staffing levels were measured using the failure to rescue rate to determine the impact on mortality. Results of this study did not indicate a significant relationship between general unit and intensive care unit patient

discharges (Talsma et al., 2014). The use of a risk-adjusted logistic regression model did not support a relationship between nurse staffing levels and patient discharges.

### **Local Background and Context**

The project site IRF was a 62-bed freestanding facility that existed as part of a national corporation of rehabilitation facilities. The IRF was regulated by The Joint Commission and state agencies. The IRF was located in rural Appalachia and provided services to a tri-state area of approximately 361,580 people. Eight acute care hospitals existed within the region, along with multiple skilled nursing facilities and inpatient rehabilitation units that served as competitors.

The project site IRF has provided rehabilitation services for patients in the tri-state for over 25 years. Services included rehabilitation for patients with: arthritis, balance and vestibular problems, bowel and bladder malfunctions, brain injuries, cardiac diseases, diabetes, hip fractures, joint replacements, trauma, neurological disorders, cancer, chronic pain, pulmonary diseases, spasticity problems, spinal cord injuries, strokes, and wounds. Patient outcomes result from the patient completing the rehabilitation therapy program and experiencing a gain in functional independence. ACTs delay or inhibit the gain in functional independence and may lead to a setback in the patient's outcome.

The average age of the patient in the project site was 73 years old, which was older in comparison with the national average age of 68 years for IRF patients. Specific to this IRF, 99.9% of patients were from home prior to hospitalization. Fifty-two percent of those patients were living with family. Fifty-seven percent of the patients were female.

Ninety-seven percent of the patients were white. Thirty-seven percent were married. Thirty-five percent were widowed. The most common comorbidities for this patient population included acute renal failure, diabetes, heart failure, pneumonia, and morbid obesity. The primary diagnosis for these patients was neurological debility. The average length of stay was 9 days. Approximately 78% of patients were discharged home after rehabilitation. Fourteen percent were discharged to acute care. Eight percent were discharged to a skilled nursing facility. These statistics were obtained from the Uniform Data System for Medical Rehabilitation Report of patients with debility discharged from inpatient rehabilitation.

#### **Role of the DNP Student**

This project became important to me during my role as chief nursing officer for the project site IRF. I discovered ACTs had been problematic for years and continued to fall above the national benchmark. I had moved on to another role in a different facility; however, I continued to care deeply for the outcomes of the IRF patients. I continued to keep this project because there was much evidence that supported the need for richer RN staffing in the IRF. I believed a new staffing model was needed for nurses to provide the level of care required by IRF patients. I still remain in close contact with the project site. I plan to present this scholarly project to the IRF's senior leadership team.

The American Association of Colleges of Nursing (AACN) considers the DNP graduate as an important agent in quality improvement (Terry, 2012). As a DNP graduate, I must be prepared to evaluate patient care delivery and to develop new approaches for meeting the needs of patient populations (AACN, 2006). Although ACT

rates were the responsibility of the director of quality and director of case management, I saw an opportunity to make improvements in the level of nursing care needed for patient outcomes. I was not a rehabilitation nurse prior to my role in this facility, so I was unfamiliar with rehab nursing responsibilities. I was surprised by the high acuity of the IRF patients and the lack of RN staffing available to meet the patients' needs. I had personal biases about nurse staffing levels because of my nursing experience in acute care hospitals. I had never worked in a freestanding, for-profit organization. I did contact nurse leaders in other IRFs and acute hospital rehabilitation units to inquire about their nurse staffing models. I discovered some other IRFs use an "all RN" staffing model. I also found acute hospital rehabilitation units that maintained an RN to patient ratio of 1:4. These units experienced high quality patient outcomes and achieved the benchmark average for ACT rates. It is my duty as a DNP student to share this knowledge with the project facility in hopes of improving patient outcomes.

### **Summary**

In summary, there was a need to improve patient outcomes by decreasing the ACT rate in the project site IRF. The current staffing model did not allow RNs to function in their highest capacity and created a margin of error for missed nursing care. Evidence existed to show the positive correlation between RN staffing and patient outcomes. Although most of the studies discussed in the literature review took place in the acute care setting, the same concept can be applied to the IRF.

Changes in Medicare criteria have allowed for more acutely ill patients to be cared for in the IRF. The project site IRF was located in a rural area with a high

population of patients who had comorbid conditions including chronic respiratory disease, heart disease, and diabetes. RNs were responsible for providing care and treatment to these patients. The RN's role is to assess, identify changes in condition, and create plans of care accordingly. A new staffing model will allow RNs the ability to complete these necessary tasks and to promote high quality patient outcomes in the IRF. The next section includes a plan for developing the new staffing model.

### Section 3: Collection and Analysis of Evidence

The purpose of this project was to develop an evidence-based nurse staffing model that would support the RN's role in the care and treatment of the IRF patient. Evidence exists to support the RN's function in the quality of patient outcomes. Analysis and synthesis of the literature related to the RN's role in patient outcomes was conducted to identify best practices for the development of the new staffing model. The newly developed model was assessed for content validity and presented to key stakeholders. The new model was accepted for implementation at a later date.

#### **Practice-Focused Questions**

Discharge to acute care rates continue to be above the benchmark of 10% for an IRF in a rural community. This indicates that all patients are not being successfully rehabilitated. RNs do not consistently function in their highest skill level in this facility based on the guidelines of the current nurse staffing model. RNs are not consistently used for patient assessment, treatment planning, and individualized patient case management because of the current staffing model. The current model may have been successful years ago when rehab patients were not as acute as they are today. The gap in practice was patients are being discharged from acute care hospitals much earlier than in the past, and these patients present to the rehab facility with multiple comorbidities and complex disease processes. These patients need thorough assessments and continued monitoring to prevent an adverse change in their condition and to facilitate their ability to be successfully rehabilitated. The guiding questions for this DNP project were as follows: Will a new staffing model created to ensure RNs function in their highest capacity to

design patient care improve patient outcomes and decrease ACTs? Will formative and summative evaluations by a group of experts increase the quality and applicability of the model?

### **Sources of Evidence**

The project started with an organizational needs assessment that was completed to determine the gap in practice resulting in poor patient outcomes. Kettner, Moroney, and Martin (2013) identified four different categories of need that were used in this assessment. The normative need is defined by experts in the field, the perceived need is the perception of those experiencing the need, the expressed need is from those seeking services, and the relative need is the need in comparison with needs/resources of another location (Kettner et al., 2013). A needs assessment was completed for this IRF using the perspectives of the organization's need (quality outcomes and successful rehabilitation), normative need (above benchmark ACT rate), perceived need (the IRF desires to improve patient outcomes by decreasing ACT rates), expressed need (patients/families expect successful rehabilitation and the IRF exists to provide this service), and relative need (the IRF is not meeting the benchmark ACT rate, which results in a decrease in patient outcomes that may encourage consumers to seek competitors who provide higher quality outcomes). Because the ACT rate has been higher than the standard set by the organization, a normative need exists. A normative need also exists for the staffing model because it is an organizational standard that unlicensed personnel are hired to support the role of the RN, not take place of the RN. The benefit of using the normative need approach is that it provides the planner with an objective target (Kettner et al., 2013). The



target may be clearly identified in the normative needs assessment; however, the perceived, expressed, and relative needs will also provide insight into stakeholder acceptance of the new staffing model.

The next step was to collect, review, and evaluate the literature related to nurse staffing models, including evidence-based practice models, skill mix, and best practice for nurse staffing in an inpatient rehab unit. An evidence-based staffing model was designed based on findings from this comprehensive literature review. The new staffing model was specifically created so that directors, supervisors, and charge nurses could easily follow the staffing model. The outcomes of this project included the results of the literature appraisal, recommendations for an evidence-based nurse staffing model, the development of the new model, and results of the formative and summative reviews.

### **Participants**

A formative review was completed by a small group of experts in the facility. The formative review was originally planned for 10 participants; however, the project site could only obtain three participants. According to the Appraisal of Guidelines for Research and Evaluation (AGREE II) instructions, at least two participant responses are needed for validity. The summative reviews were completed by 10 of the IRF's key stakeholders including six RNs, two MBAs, an MSW, and a CPA. The participants for the formative and summative reviews were chosen by the CEO to maintain anonymity because I previously worked at the project site.

**Procedures**

The AGREE II instrument was used in both the formative and summative reviews as the method for evaluating the new staffing model (Appendix F). Permission to use the AGREE II instrument was given online (Appendix E). The AGREE II instrument is designed to assess the quality of the guideline, provide a strategy for development, and describe how information should be reported in the guideline (Brouwers et al., 2010). The AGREE II instrument consists of six domains for evaluation including scope and purpose, stakeholder involvement, rigor of development, clarity of presentation, applicability, and editorial independence (Brouwers et al., 2010). Additionally, there are two global ratings items for overall assessment of the guideline (Brouwers et al., 2010). The participants in the formative review had three business days to review the new staffing model and complete the AGREE II instrument. Revisions were made based on the feedback from the formative reviews. The revised staffing care model was then given to the CEO to distribute to the 10 participants in the summative review. They also had three business days to complete the AGREE II instrument and return for data analysis.

**Protections**

Walden University Institutional Review Board (IRB) approval, number 06-02-17-0176327, was obtained before designing the new staffing model and collecting data from the formative and summative reviews. Participants in both groups received hand-delivered, secure packets containing a letter of explanation of the project, the staffing care model, consent form, contact information, instructions for completion, and the

AGREE II instrument. Participants were required to exclude any personal information on the survey to maintain privacy.

### **Analysis and Synthesis**

Upon receiving IRB approval for this project, I conducted an electronic literature search on creating a nurse staffing model to improve patient outcomes by using the following databases: CINAHL, Medline, PubMed, EBSCO, Nursing and Allied Health, Science Direct, and Cochrane Library. I also used the Google Scholar search engine. Only original, peer-reviewed articles were selected to guarantee content validity. Articles older than 10 years were removed to ensure current practice was followed. The terms used for the literature search were *nurse staffing models*, *registered nurse staffing*, *nurse staffing matrix*, *RN staffing*, *RN ratios*, *nurse ratios*, *nurse staffing model of care delivery and interventions*, *rehabilitation nursing model*, *rehabilitation nursing protocols*, *patient care protocols*, and *patient outcomes*. Boolean operators *and* and *or* were used between the search terms to locate relevant articles.

A small doctoral project group was formed, including the chief nursing officer, chief financial officer, and director of quality. Meetings were set to review the literature and guidelines. The literature was reviewed and critically appraised to identify best practices in nurse staffing for the achievement of quality patient outcomes. Components of the new staffing model were developed based on the results of the literature search. The staffing model was designed specifically for the IRF's nursing unit using these components. The AGREE II instrument was first used by a team of experts to analyze the new staffing model. Revisions were made after a comprehensive review of the feedback

from the formative evaluations. The revised model was then given to a group of stakeholders for final analysis, again using the AGREE II instrument.

### **Project Evaluation Plan**

Approval for implementation was determined by results of the formative and summative reviews. Quality and approval of the new model was based on the scoring of the AGREE II instrument, including an analysis of all six domains (see Brouwers et al., 2010). An overall high percentage score was achieved; therefore, the new staffing model was recommended for implementation. The new staffing model was presented to the IRF's leaders for future adoption by the organization. The effects of the new staffing model on patient outcomes may reach other departments within the organization, which made it necessary to include these department leaders in the presentation of this project. This process allowed department leaders to ask pertinent questions and give feedback.

### **Summary**

Based on an organizational needs assessment, the project site IRF had a need to improve patient outcomes due to high ACT rates. Evidence from the literature supported the RN's role in patient outcomes. The gap in practice was the organization's lack of change in the nurse staffing model to accommodate the higher acuity of patients being admitted to the rehab facility. A literature search was conducted to determine best practices in nurse staffing, and a new model was designed based on evidence for future implementation. The new staffing model received formative and summative reviews to ensure validity, reliability, and approval for implementation.

#### Section 4: Findings and Recommendations

The purpose of this DNP project was to develop an evidence-based nurse staffing care model that would support the RN's role in the care and treatment of the rehab patient. The local problem was that IRF patients were being discharged back to acute care without being successfully rehabilitated. The discharge-to-acute-care rate is benchmarked at 10% or less, and this facility had not been meeting this standard of care. Inpatient rehab patients were experiencing changes in their condition while in rehab, and RNs were not consistently picking up on subtle changes in patients' conditions. RNs in this facility were not consistently functioning at their highest skill level based on the current staffing model, which had been in use for several years. This staffing model was not updated when Medicare criteria changed to allow more acute patients in the inpatient rehab setting.

The gap in practice was patients were being discharged from acute care hospitals much earlier than in previous years, and these patients required thorough assessment and monitoring while in the acute rehab environment. The RN role was not supported by the current staffing model in providing the maximum benefit of the RN's skill set to the patient. The guiding questions for this DNP project were as follows: Will a new staffing model created to ensure RNs function in their highest capacity to design patient care improve patient outcomes and decrease ACTs? Will formative and summative evaluations by a group of experts increase the quality and applicability of the model?

Sources of evidence for the new staffing care model were acquired from an exhaustive literature review of the nurse staffing models used in the IRF setting, along

with literature supporting improved patient outcomes. There was little published research specific to inpatient rehab units. There was one research article specific to IRF nurse staffing and patient outcomes; 54 rehabilitation facilities participated in the study of their nurse staffing patterns and patient outcomes (Nelson et al., 2007). The results of this study affirmed the impact of the role of the rehab nurse in patient outcomes. Additionally, the Association of Rehabilitation Nurses (ARN, 2014) had developed a statement on nurse staffing as well as a competency model for nursing care. This competency model incorporated all the professional aspects of the RN's role in providing care for today's rehab patient (ARN, 2016). A total of 14 peer-reviewed research articles 10 years old or less were used in the development of the new staffing care model. The essential staffing component of the new model was designed based on recommendations from the American Nurses Association (ANA, 2012). The IRF quality measures components of the new model were attributed to IRF regulations from the Centers for Medicare and Medicaid Services (CMS, 2017). Finally, the staffing care model was developed with the assistance of a small project team of stakeholders including the chief nursing officer, chief financial officer, and director of quality. The model was then presented to a group of expert end users for review. The AGREE II instrument was used to determine the validity and acceptance of the new model.

### **Findings and Implications**

After IRB approval, I sent the doctoral project team project information via e-mail and met with the team regularly through conference calls. The AGREE II instrument was used by the project team to provide formative feedback for the staffing care model. Once

all revisions were made, the AGREE II instrument was given to the CEO of the facility, along with the AGREE II instruction booklet, project presentation, new nurse staffing care model, and consent form. The CEO was instructed to give a packet to 10 expert end users for the summative review; these end users would have three business days to review the staffing model, ask any questions, and complete the AGREE II survey instrument. At the end of three business days, the completed surveys were placed in a sealed envelope and left with the front desk secretary for pickup by me.

The expert panel of end users provided a summative review of the final project by completing the AGREE II instrument. This panel included 10 participants chosen by the CEO to maintain anonymity and included six RNs, two MBAs, one MSW, and one CPA. The AGREE II instrument consists of 23 items organized within six domains (Brouwers et al., 2010). Each item was rated on a 7-point scale ranging from 7 (strongly agree) to 1 (strongly disagree). The scale is used to measure the extent of the expert's agreement with the criteria (Brouwers et al., 2010).

Domain 1, scope and purpose, was completed by all 10 participants and was given a combined score of 94%, with 100% of items rated as strongly agree or agree. Based on the domain items, the expert panel agreed the overall objectives, health questions, and target population of the new staffing model were specifically described (see Brouwers et al., 2010).

Domain 2, stakeholder involvement, was completed by all 10 participants and was given a combined score of 93%, with 97% of items rated as strongly agree or agree. The expert panel agreed the staffing care model development included individuals from all

relevant professional groups, the views of the target population were sought, and the target users were clearly defined (see Brouwers et al., 2010).

Domain 3, rigor of development, was completed by all 10 participants and was given a combined score of 91%, with 90% of items rated as strongly agree or agree. Based on these ratings, the expert panel agreed that systematic methods were used to search for evidence, the criteria for selecting evidence was clearly described, the strengths/limitations of the evidence were clearly described, the methods for formulating the recommendations were clearly described, the health benefits/risks were considered, and an explicit link between the recommendations and supporting evidence was provided (see Brouwers et al., 2010).

Domain 4, clarity of presentation, was completed by all 10 participants and was given a combined score of 91%, with 97% of items rated as strongly agree or agree. Based on these scores, the recommendations were specific, the different options for managing the staffing plan were clearly presented, and key recommendations were easily identifiable (see Brouwers et al., 2010).

Domain 5, applicability, was completed by all 10 participants and was given a combined score of 93%, with 98% of items rated as strongly agree or agree. The panel agreed the new staffing model described facilitators and barriers to its application, the new model provided tools on how it could be put into practice, the potential resource/financial implications were considered, and monitoring/auditing criteria were presented (see Brouwers et al., 2010).



Domain 6, editorial independence, was completed by nine of the 10 participants, and was given a total combined score of 91%, with 89% of items rated as strongly agree or agree. The expert panel agreed that the views of the funding body did not influence the content of the new staffing model and that competing interests of the development group were addressed (see Brouwers et al., 2010).

Finally, the overall guideline assessment was completed by nine of the 10 participants. The same participant who did not complete Domain 6 was the same participant who did not complete the overall score question. It is unknown why this participant did not complete the last two pages of the AGREE II instrument. However, this same participant marked all answered items as a 7. The overall score from the nine participants was 91%, with 100% rating the new staffing care model as one of highest possible quality or high quality. All nine participants recommended the new staffing model for use, without modifications. Only one participant made comments in the notes section stating, “It was quite clear, easy to follow, and user friendly.”

These findings suggest that end users are ready for a change from the current nurse staffing model. This is significant because the current staffing model had been in place for years without an update, and RNs were being used in the patient care technician role, admission nurse role, or medication nurse role. The RNs were not functioning at their fullest potential, and stakeholders in the organization did not link this to the excess in ACTs. The new evidence-based nursing care model demonstrated the connection between the RN role and patient outcomes. This is a positive contribution to social change because implementation of the new model may reduce ACTs and improve quality

measures. The facility could then share this staffing model with other acute inpatient rehabilitation nursing units in the organization. Patient outcomes could be positively affected in the other facilities, and more patients may achieve successful rehabilitation.

Implications from these findings also include the need for additional research on staffing models in IRFs. There is very little research on nurse staffing models in the IRF. This facility could use the implementation of this new model as a research project in their nursing unit by evaluating specific patient outcomes pre and post implementation, by evaluating nursing staff satisfaction pre and post implementation, or by evaluating patient satisfaction pre and post implementation.

### **Recommendations**

The new staffing care model has been recommended for use in the IRF. The project team made it clear they want to decide when and how to implement the new staffing model. I recommended this facility should use Lewin's change theory in the implementation plan for this new model. Even though the expert panel recommended the staffing guideline, there are multiple staff members who will be affected and who did not participate in this project. It is vital for the nurse leaders to involve all nursing staff in the planning process for implementation and gather feedback throughout the process. In addition, frontline staff should be allowed to participate in ongoing evaluation of the effectiveness of this model. One suggestion is for frontline staff to be involved in quality outcomes auditing so they can see firsthand the impact of the change in staffing models.

### **Contributions of the Doctoral Project Team**

The doctoral project team was a small team that included stakeholders from nursing, quality, and finance. As project leader, I assigned roles to each member, which was an easy task based on their areas of expertise. Due to scheduling conflicts, conference calls were the most feasible means for meetings. We also had constant e-mail communication.

The project team was instrumental in providing formative feedback informally throughout the process and formally through use of the AGREE II tool. As project leader, I learned the importance of taking constructive feedback and applying it to the development of the model. After receiving the results of the formative review from the team, I had to make substantial revisions in the clarity of the presentation. The project team did not believe that end users would understand how to apply the AGREE II instrument to the rating of the new model. This feedback assisted me in developing a clear presentation of the model, and the summative review demonstrated that end users understood and accepted the model without need for modification.

The project team will likely take the lead in implementing the new staffing model in the future. One team member reported that because of her involvement on this team, she understood how to write and evaluate guidelines for the facility's Joint Commission Stroke Certification. Another member of the project team told me she learned so much throughout this process that she was inspired to go back to school for her doctorate. As project leader, I learned the importance of clear, consistent communication, which includes active listening.

### **Strengths and Limitations**

Strengths of this project include the amount of evidence linking the RN's role to quality patient outcomes. The new staffing care model was developed based on evidence, and expert end users participated in the summative reviews of the new model. Limitations include the lack of evidence specific to IRFs. Because the IRF patient must be medically cleared to go to acute rehab and to participate in 3 hours of therapy per day at least 5 days a week, the nurse's role is not entirely the same as in acute medical-surgical care units. Additional limitations include the small sample size of one facility in a rural area with limited resources. Results may not represent the entire population of IRFs.

### **Summary**

Results of formative feedback led to the development of a clear, concise, evidence-based nurse staffing care model (Appendix G) that was accepted for implementation following a summative review by 10 expert end users. Because very little research is available for nurse staffing models in IRFs, this project may be used to evaluate the impact of nurse staffing on patient outcomes in this facility as well as in other similar facilities. The goal is a reduction in ACTs and an improvement in patient outcomes.

## Section 5: Dissemination Plan

The plan to disseminate the new staffing care model and results of this scholarly project to the IRF included a podium presentation to the senior executive team. The senior executive team includes the chief executive officer; chief financial officer; directors of nursing, therapy, case management, and quality; infection control manager; nursing supervisors; and the prospective payment manager. The project results will be presented to members of the frontline nursing team during a monthly staff meeting after the senior team decides on an implementation plan.

This scholarly project may also be disseminated to other IRFs that belong to the same health system as the project site. The number of ACTs continues to be problematic in some of these other facilities, and the new staffing care model may be beneficial for their patient outcomes. The staffing model could be presented at the organization's annual nurse leader meeting, which would include representatives from all facilities.

This scholarly project will be presented at the annual Nursing Research Symposium sponsored by a hospital in the local tri-state area. Nurse leaders and administrators from local hospitals, skilled nursing facilities, and colleges attend this symposium. Furthermore, this project may be disseminated as a poster presentation at the annual American Nurses Association conference and as a published article in the *Association of Rehabilitation Nurses* journal.

### **Analysis of Self as Practitioner, Scholar, and Project Manager**

According to DNP Essential I, Scientific Underpinnings of Practice, the doctorate-prepared practitioner focuses on nursing actions that will positively affect

health status changes and develop new practice approaches based on nursing theories to support the change (AACN, 2006). It was easy for me to see the effects of the current nurse staffing model on patient outcomes at the project site while I was working in the role of chief nursing officer. At the time, I did not have the tools or experience in evidence-based practice to develop a plan for improvement. The DNP project prepared me to identify the nurse's role in patient outcomes, analyze supportive evidence related to the problem, and formulate a plan for process improvement.

The DNP Essential III, Clinical Scholarship and Analytical Methods for Evidence-Based Practice, supports the doctorate-prepared nurse's role as a scholar in applying knowledge to solve a problem (AACN, 2006). Since my entry into nursing over 16 years ago, I have been passionate about identifying nursing process problems and creating solutions. I believe the frontline nurses have the most influence in creating positive change at the bedside. As a nurse leader and DNP scholar, I feel empowered to encourage problem-solving by the bedside nurse. I feel I can make a more significant impact on patient outcomes by supporting, motivating, and teaching the bedside nurses, whom I am privileged to lead. The DNP program provided me with the knowledge to develop a solution to a nursing practice problem and share the process with my nursing team in hopes they will feel empowered to do the same.

My role as a project team leader proved to be challenging. I have been involved in multiple committees and task forces during my time as a nurse leader. However, this was the first time I had to lead a project in which the team did not see the need for change. I learned that it was not necessary for the team to agree with my plan, but it was essential

for the team to be part of creating the plan. As we discussed the evidence of missed nursing care effects on patient outcomes, the project team became more focused on creating a solution that would improve successful rehabilitation of patients and meet staffing needs. I learned to listen to the team's concerns instead of having my mind set on the answer. I believe that is why the new staffing care model was accepted for implementation without any modifications. I am thankful for what I have learned through this process, and I feel empowered to volunteer to lead project teams within my organization.

### **Summary**

The purpose of this evidence-based project was to design a nurse staffing care model that would support the RN's role in the care and treatment of the rehab patient and ultimately lead to the patient achieving successful rehabilitation. An evidence-based staffing model was developed through the commitment of a project team and was unanimously accepted for implementation by stakeholders. Dissemination of this project is planned on local and national levels in hopes that fellow nurse leaders will strive to support the professional nurse's role in improving patient outcomes.

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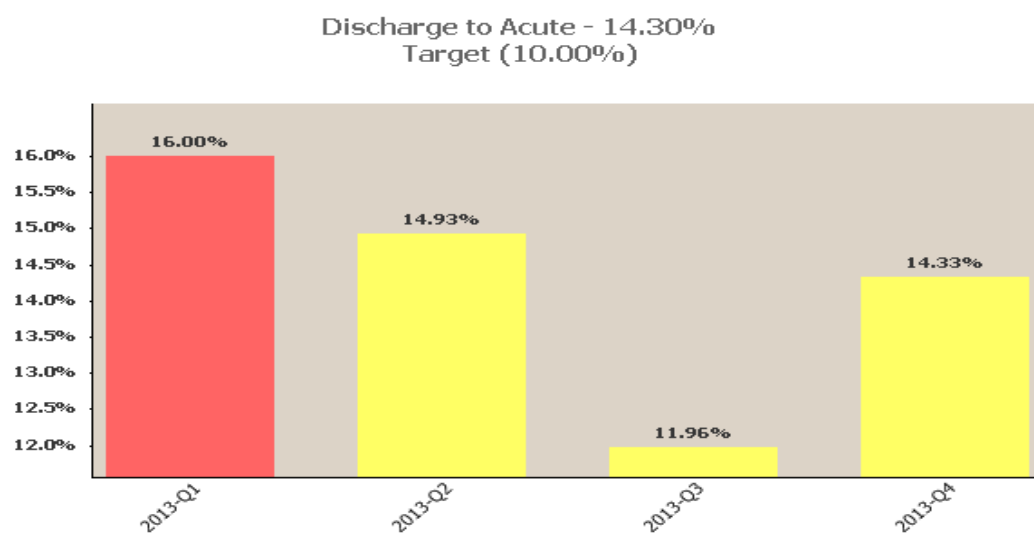
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## Appendix A: 2013 Discharge to Community

FinClassGroup	#Discharges	DC to Comm	DC to SNF	DC to Acute
	1196	77.59%	7.94%	14.30%
Medicare	964	76.87%	8.92%	14.00%
Non Medicare	232	80.60%	3.88%	15.52%

*Table 1.* This table illustrates the number of patient discharges in 2013 and has them broken down into discharge to community, skilled nursing facility (SNF), and acute care. “Green” represents metrics that are on target for goal achievement. “Yellow” represents numbers that are not within target, but have potential to be achieved. “Red” represents metrics that are significantly far from goal.



*Figure 1.* This bar graph represents the percentage of ACTs by quarter for 2013. Note the target goal is 10% or less. This goal is not achieved in any of the quarters.

## Appendix B: 12 Month Projection for Revenue

RAND Analysis  
Example (annual)

A 25% reduction in ACT would approximate	32	patients
Estimated average length of stay under RAND	<u>9</u>	days
Total patient days	288	
Average reimbursement	<u>\$1,191.81</u>	
Effect on reimbursement	<u><u>\$343,241.28</u></u>	
A 30% reduction in ACT would approximate	38	patients
Estimated average length of stay under RAND	<u>9</u>	days
Total patient days	342	
Average reimbursement	<u>\$1,191.81</u>	
Effect on reimbursement	<u><u>\$407,599.02</u></u>	

*Table 2.* This table represents an annual projection of revenue gained from decreasing ACTs by 25% and 30% respectively.

## Appendix C: Missed Nursing Care Model

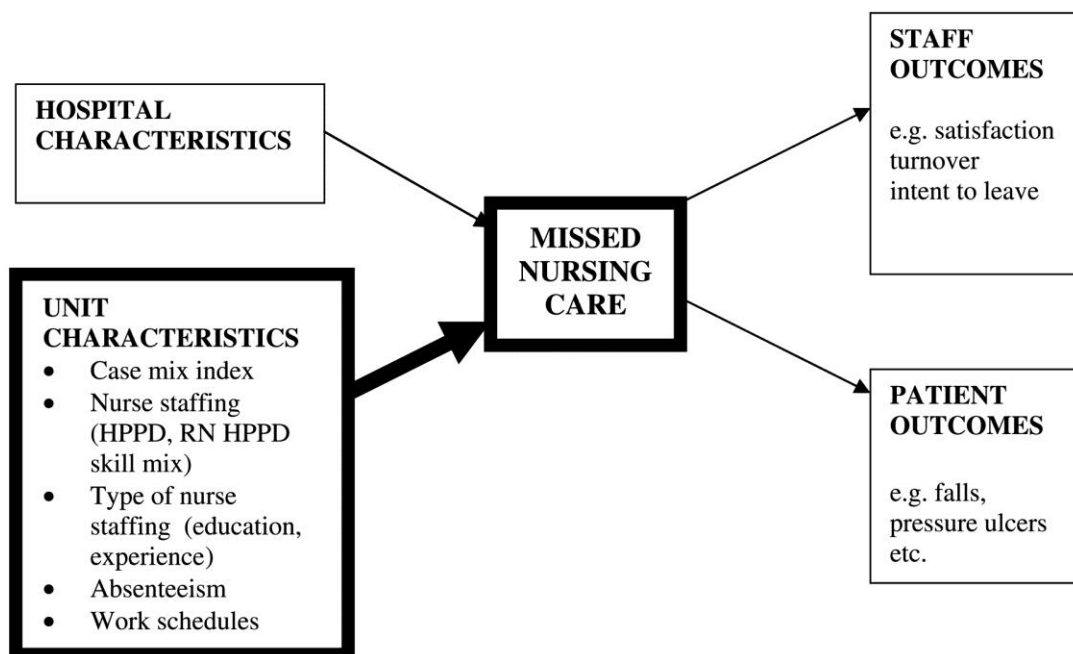
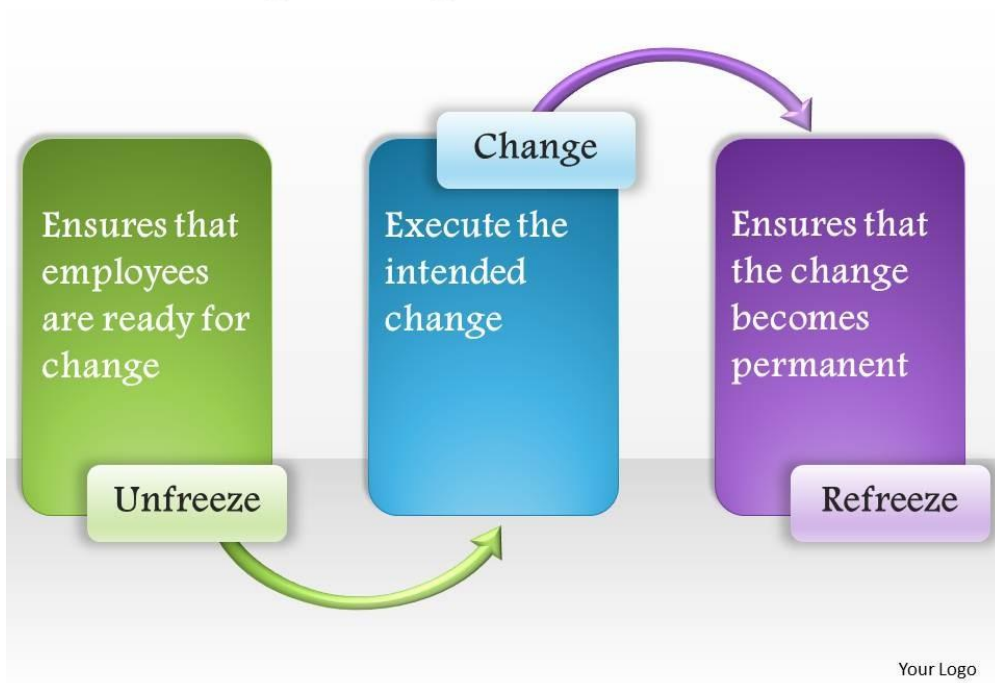


Figure 2. Missed Nursing Care Model (Kalisch, Tschannen, & Lee, 2012)

## Appendix D: Lewin's Change Theory

**Lewin Change Management Model***Figure 3. Lewin's Change Theory*



## Appendix E: AGREE II Copyright Permission

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Appendix F: AGREE II Instrument



## DOMAIN 1. SCOPE AND PURPOSE

1. The overall objective(s) of the guideline is (are) specifically described.

<b>1</b> Strongly Disagree	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b> Strongly Agree
-------------------------------	----------	----------	----------	----------	----------	----------------------------

*Comments*

2. The health question(s) covered by the guideline is (are) specifically described.

<b>1</b> Strongly Disagree	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b> Strongly Agree
-------------------------------	----------	----------	----------	----------	----------	----------------------------

*Comments*

3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.

<b>1</b> Strongly Disagree	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b> Strongly Agree
-------------------------------	----------	----------	----------	----------	----------	----------------------------

*Comments*

**DOMAIN 2. STAKEHOLDER INVOLVEMENT**

4. The guideline development group includes individuals from all relevant professional groups.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

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5. The views and preferences of the target population (patients, public, etc.) have been sought.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

---

6. The target users of the guideline are clearly defined.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

### DOMAIN 3. RIGOUR OF DEVELOPMENT

7. Systematic methods were used to search for evidence.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

8. The criteria for selecting the evidence are clearly described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

9. The strengths and limitations of the body of evidence are clearly described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

**DOMAIN 3. RIGOUR OF DEVELOPMENT continued**

10. The methods for formulating the recommendations are clearly described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

11. The health benefits, side effects, and risks have been considered in formulating the recommendations.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

12. There is an explicit link between the recommendations and the supporting evidence.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

**DOMAIN 3. RIGOUR OF DEVELOPMENT** continued

13. The guideline has been externally reviewed by experts prior to its publication.

<b>1</b> Strongly Disagree	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b> Strongly Agree
-------------------------------	----------	----------	----------	----------	----------	----------------------------

*Comments*

14. A procedure for updating the guideline is provided.

<b>1</b> Strongly Disagree	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b> Strongly Agree
-------------------------------	----------	----------	----------	----------	----------	----------------------------

*Comments*

#### DOMAIN 4. CLARITY OF PRESENTATION

15. The recommendations are specific and unambiguous.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

16. The different options for management of the condition or health issue are clearly presented.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

17. Key recommendations are easily identifiable.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*



## DOMAIN 5. APPLICABILITY

18. The guideline describes facilitators and barriers to its application.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

19. The guideline provides advice and/or tools on how the recommendations can be put into practice.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

20. The potential resource implications of applying the recommendations have been considered.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
------------------------	---	---	---	---	---	---------------------

*Comments*

**DOMAIN 5. APPLICABILITY** continued

21. The guideline presents monitoring and/or auditing criteria.

<b>1</b> Strongly Disagree	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b> Strongly Agree
-------------------------------	----------	----------	----------	----------	----------	----------------------------

*Comments*

**DOMAIN 6. EDITORIAL INDEPENDENCE**

22. The views of the funding body have not influenced the content of the guideline.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

*Comments*

23. Competing interests of guideline development group members have been recorded and addressed.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

*Comments*

## OVERALL GUIDELINE ASSESSMENT

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For each question, please choose the response which best characterizes the guideline assessed:

### 1. Rate the overall quality of this guideline.

1							7
Lowest possible quality	2	3	4	5	6	Highest possible quality	

### 2. I would recommend this guideline for use.

Yes	
Yes, with modifications	
No	

### NOTES

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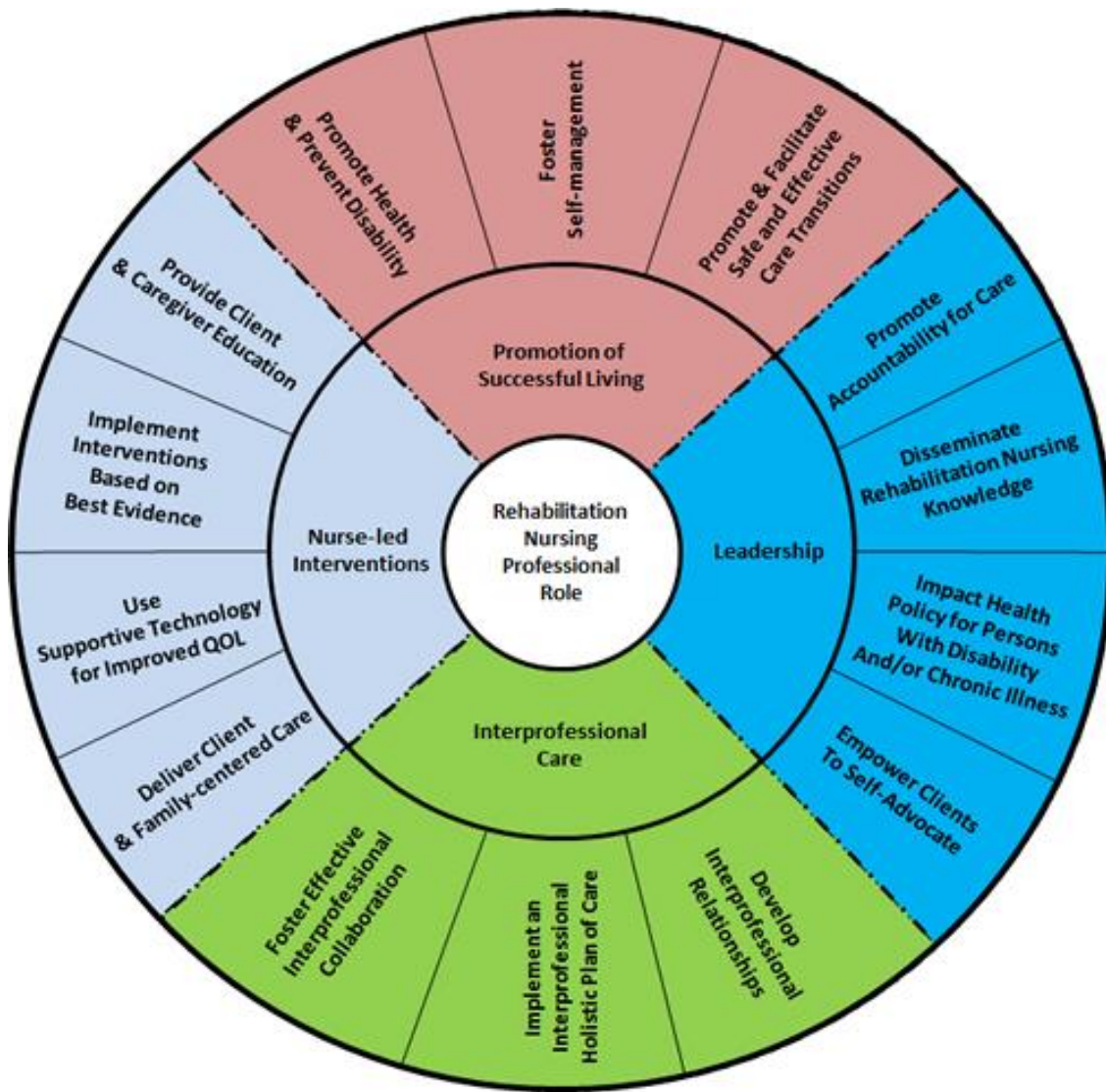
## Appendix G: Staffing Care Model

**Department of Nursing: Staffing Model**

<b>Nursing Care Provision</b>	<b>Essential Staffing</b>	<b>Staffing for Acuity</b>	<b>Quality Standards</b>
<p>Nursing care is provided for the stable rehabilitation patient in a 62 bed unit.</p> <p>Responsibilities of the rehabilitation staff nurse:</p> <ul style="list-style-type: none"> <li>• Demonstrate specialized knowledge and skills</li> <li>• Perform hands on nursing care by using the nursing process</li> <li>• Provide direction to ancillary nursing personnel</li> <li>• Coordinate nursing care activities</li> <li>• Demonstrate effective communication skills</li> <li>• Coordinate appropriate resources for individualized teaching/discharge plans</li> <li>• Apply nursing research to clinical practice</li> </ul> <p>Roles of the rehabilitation staff nurse:</p> <ul style="list-style-type: none"> <li>• Caregiver</li> <li>• Teacher</li> <li>• Collaborator</li> <li>• Client Advocate</li> </ul> <p>The professional rehabilitation RN will follow the ARN Nurse Competency Model*. This model contains four domains essential for the role of the rehab RN:</p> <ul style="list-style-type: none"> <li>• Nurse-led Interventions</li> <li>• Promotion of Successful Living</li> <li>• Leadership</li> <li>• Interprofessional Care</li> </ul> <p>*See attachment</p>	<p>The nursing unit is staffed with a charge nurse RN, staff RNs, staff LPNs, rehabilitation techs, and a unit secretary for daily operations.</p> <p>All nursing staff members are oriented and trained upon hire and annually to demonstrate competency in the direct care of the population served.</p> <p>A minimum staffing target of 6.0 nursing HPPD is used as a guideline for the safe staffing of this unit.</p> <p>A charge nurse RN will be scheduled for each shift to oversee the care delivery and operations of the nursing unit.</p> <p>The staffing target for nurses (RN/LPN) is a nurse to patient ratio of 1:8 for both day and night shifts.</p> <p>The nurse will serve as the team leader/primary nurse for his/her patients, which includes the responsibility for overall care delivery and nursing care planning.</p> <p>The staffing target for rehab techs is 1:8 for both day and night shifts.</p> <p>Each rehab tech will be partnered with a team leader/primary nurse and will only perform duties as stated in the rehab tech job description.</p>	<p>Staffing for acuity on the rehab nursing unit considers the following criteria:</p> <ul style="list-style-type: none"> <li>• Complexity of patient's condition</li> <li>• Knowledge and skill level of nursing staff</li> <li>• Infection control and safety issues</li> <li>• Continuity of Care</li> <li>• Projected Number of Admissions</li> <li>• Projected Number of Discharges</li> </ul> <p>Factors that contribute to a higher level of acuity on the rehab nursing unit include but are not limited to:</p> <ul style="list-style-type: none"> <li>• Frequent vital signs or blood sugar monitoring</li> <li>• Multiple IV Medications</li> <li>• Dementia/Delirium</li> <li>• Dialysis</li> <li>• Complicated Wound Care</li> <li>• Continuous Bladder Irrigation (CBI)</li> <li>• Bariatric Patient</li> <li>• High Fall Risk</li> <li>• Suicide Risk</li> </ul>	<p>Quality Measures:</p> <ul style="list-style-type: none"> <li>• Discharge to Community (ACT Rate of 10% or &lt;)</li> <li>• Missed Nursing Care</li> <li>• FIM Gain</li> <li>• Patient Falls</li> <li>• CAUTI</li> <li>• Pressure Ulcers</li> <li>• Medication Errors</li> <li>• Hospital-Acquired Infections</li> </ul> <p>Evaluation:</p> <ul style="list-style-type: none"> <li>• This staffing model will be re-evaluated by the nursing unit leaders at least annually and as needed.</li> <li>• Front-line nursing staff will provide input regarding this model during each annual evaluation and as needed.</li> </ul>

	<p>A unit secretary will be scheduled for day/eve shift to support nursing unit operations.</p> <p>This staffing model is only a guideline. The nurse supervisor or charge nurse's assessment will determine final need for the unit based on patient needs, safety, and acuity levels.</p>		
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Appendix G: Staffing Care Model (cont.)



**Association of  
Rehabilitation  
Nurses  
Competency  
Model**