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Reducing the Incidence of Hospital Acquired Pressure Injuries with an Interprofessional Collaboration Using Range of Motion Exercises

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Reducing The Incidence of Hospital Acquired Pressure Injuries with an Interprofessional Collaboration Using Range of Motion Exercises

A DNP Project Submitted to the
Graduate Faculty
of Jacksonville State University
in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Nursing Practice

By

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Abstract

Background: Hospital - Acquired Pressure Injuries (HAPIs) are an enormous problem for healthcare institutions and patients. HAPIs are painful, can lead to additional infections, increase the length of stay, and even cause death. Hospitals around the country are experiencing increases in the number of HAPIs. This project was implemented in a medical-surgical unit of local urban hospital in the southeastern Unites States. The medical-surgical unit reported an increase in the number of HAPIs that exceeded the national average of 3%.

Purpose*:* The purpose of this quality improvement project was to apply an interprofessional approach to reduce HAPIs using a range of motion exercises with patients on a medical-surgical floor who scored an 18 or less on the Braden Scale.

Methods*:* The nursing staff was trained on ROM exercises, documentation, and frequency of intervention (two times in 24 hours). The interprofessional collaboration included the wound care nurses providing education and support, physical therapists providing education on how to perform range of motion exercises, and the staff nurses implementing the ROM exercises. The electronic health record (EMR) was audited weekly to evaluate adherence to the protocol. Retraining was provided as needed. ROM exercises compliance and HAPIs were measured during the project time frame and compared to the pre-project implementation data.

Results*:* Results of the paired-t test indicated that there is a significantly large difference between Before ($M = 3$, $SD = 0$) and After ($M = 2$, $SD = 0$), $t(0) = \text{Infinity}$, $p < .001$. The incidence rate for patients on a medical/surgical floor over 2 months was calculated at 2.0%, a decrease from the national average representing a successful intervention.

Conclusion*:* This project revealed that an interprofessional collaboration using ROM exercises can reduce the incidence of hospital-acquired pressure injuries in high-risk patients.

Keywords: pressure injuries, pressure ulcers, wound care, early mobilization, range of motion exercises, interprofessional, collaboration, multidisciplinary, hospital-acquired pressure injuries, and Braden Scale.

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Reducing The Incidence of Hospital Acquired Pressure Injuries with an Interprofessional Collaboration Using Range of Motion Exercises

Hospital-Acquired Pressure Injuries (HAPIs) remain a major health and safety concern. In April 2016, the National Pressure Ulcer Advisory Panel (NPUAP) changed the phrase pressure ulcer with pressure injury in the NPUAP Injury Staging System to define injuries in both intact and ulcerated skin (Kennerly et al., 2022). Pressure injury prevention continues to be a challenge for acute care facilities even with the initiation of evidence-based interventions (Getie et al., 2020). Although pressure injuries exist across various parts of the healthcare setting, the highest incidence occurs in the hospital. According to the World Health Organization (2023), over 2.5 million people in the United States develop pressure injuries yearly. Pressure injuries can negatively affect patient outcomes and quality of life. Pressure injuries are painful, challenging to heal, costly, and life-changing for patients (Joyce et al., 2018). HAPIs can leave patients vulnerable to serious adverse events such as infections, disabled, and even death (Rodinelli, et al., 2018).

This Doctorate of Nursing Practice (DNP) project objective was to reduce the incidence of HAPIs. To reduce the number of HAPIs a collaborative/ multidisciplinary approach was applied. The team was comprised of staff nurses, wound care nursing experts, and physical therapy staff. using ROM exercises for patients who have been identified as high risk for developing HAPIs. ROM exercise increases perfusion and circulation, which in turn offers tissue protection and prevents tissue damage.

Background

All hospitalized adult and geriatric patients are at risk for developing HAPIs. HAPIs are defined as any localized damage to the skin and underlying soft tissue, usually over a bony

prominence or related to a medical or other device resulting from constant pressure during an inpatient hospital stay (Kennerly et al., 2022). When the skin is exposed to continuous pressure it can lead to a decrease in blood flow, ischemia, and tissue death. HAPIs are a significant health issue and one of the biggest challenges acute facilities face daily (The Joint Commission, 2018). According to the Centers for Medicare and Medicaid Services,(2021), about 40 % of HAPIs are avoidable and this results in the reduction of reimbursement and payment to acute care facilities. The development of HAPIs is a sentinel event as it relates to patient safety measures. HAPIs result in significant emotional distress, depression, loss of independence, weakness, and debilitation for the patient (Gasper et al., 2019). The Joint Commission (2022), indicated that HAPIs cause remarkable consequences to the patient which include a longer length of stay in the hospital, increased medical or surgical interventions, increased morbidity, and premature mortality. The Agency for Healthcare Research and Quality [AHRQ],(2020) specifies that HAPIs result in 60,000 deaths a year, more than 17,000 lawsuits, and 11.6 billion in healthcare dollars.

According to Siotos et al., (2022) the incidence of pressure injuries in the United States remained stable with no noteworthy improvement from 1990 to 2017. The national incidence of HAPI is 3%, Alabama is 3.8% and at a local hospital it is 4%. Combating HAPIs is not only a global or national issue but also a local issue. The medical-surgical unit at a urban hospital in the southeastern United States had the highest rate of HAPIs compared to the other surrounding urban hospitals. The wound care nursing staff, nurse manager, quality improvement committee, and this DNP student confirmed an increase in the incidence of pressure injuries in the medical-surgical unit of this acute care facility. The medical-surgical floor saw a HAPI rate of 4%. This increase reflects an average of one to two HAPIs a month. The local facility reported 44 HAPIs

in 2022 and 23 currently. This unit admits approximately 750 patients a year with a variety of medical diagnoses and conditions such as diabetes, heart disease, vascular disease, and other identified comorbidities. The vulnerable population at risk for developing pressure injuries are patients with decreased mobility, diabetes, peripheral vascular disease, spinal cord injuries, sensory deficient disorders, gerontology, and other identified comorbidities. Because of the increased rate of HAPIs, the proposed enhanced intervention such as an interprofessional collaboration between staff nurses, wound care nurses, and physical therapist using ROM is necessary, timely, and appropriate.

Needs Analysis

A SWOT analysis was conducted at the DNP facility and currently, there is no standardized protocol in place to perform ROM exercises. Nurses do not routinely perform ROM exercises on patients. The hospital quality management monthly report identified one to two HAPIs a month from January 2022 through December 2022. The most visible gap identified by the quality management index monthly report, wound care nurse, physical therapy staff, and the DNP was that no perfusion enhancement protocol that increases circulation and perfusion that aids in wound healing such as ROM exercises (early mobilization, activities, or exercise) is currently being utilized in the facility or unit. Early mobilization activities can include frequent moving or positioning, passive and active exercise of the limbs, side lying, bed mobility activities, and pressure relief interventions (Kennerly, 2022). ROM exercises are designed to move the joint and soft tissues through several physiological positions. One benefit of ROM exercises is it improves circulation and helps in the wound-healing which reduces pressure injuries.

Problem Statement

In a monthly quality management meeting at an urban hospital in the southeastern United States hospital, a brainstorming and exploratory meeting was conducted. The chief nursing officer (CNO), wound care nursing staff, nurse managers, nursing councils, quality management system design coordinator, and the DNP student met to talk about the increase in the incidence of HAPIs. It was in this meeting that the wound care nurses and the DNP student presented the idea for the need to incorporate early mobilization (ROM) exercises for adult and geriatric patients who are at risk for developing HAPIs. This was the inception of this quality improvement project. The wound care nursing team also introduced the idea of a collaborative/multidisciplinary approach which included staff nurses, wound care nurses, and the physical therapy department. The meeting concluded with the plan to come up with a plan and ideas that could decrease the incidence of HAPIs. The hospital administration and quality management department had growing concerns because despite their best evidenced-based efforts patients continued to develop HAPIs. If this trend continues to rise, patients will have poor health outcomes and decreased quality of life. An enhanced protocol to provide ROM to increase circulation and perfusion to tissue can potentially prevent HAPI.

The PICOT question that guided this project was as follows: In geriatric/adult patients on a medical and surgical floor with a high risk for developing hospital-acquired pressure injuries, does an interprofessional collaboration with wound care nursing and physical therapy to provide ROM exercises, compared to current pressure injury prevention practice decrease the incidence of HAPIs, within 8 weeks?

Aims and Objectives

This quality improvement (QI) project aimed to evaluate if implementing range of motion exercises over eight weeks would reduce the incidence of HAPIs in adults and geriatrics on a medical-surgical unit. The objectives guided the project and described measurable strategies that the Doctorate of Nursing (DNP) student implemented for the changes. The objectives for the QI project were the following:

1. Provided education to the nurses on the medical-surgical floor on how to correctly perform ROM exercises,
2. Educated the nurses on the medical surgical floor on how to properly document in EMR after completion of ROM exercises
3. Evaluated if, after initiation of ROM, the incidence of HAPI decreased in the medical surgical unit decreased after 8 weeks.

Review of Literature

Adult and geriatric patients admitted to the medical-surgical floor are not exempt from developing hospital-acquired pressure injuries despite current interventions and advances in healthcare. An appraisal of the literature to produce a collection of evidence-based research was imperative to determine if an interprofessional collaboration between staff nurses, wound care nurses, and physical therapists using ROM can decrease the incidence of HAPIs.

The databases used included the Cumulative Index to Nursing and Allied Health (CINAHL), PubMed, Cochrane, OVID, and Google Scholar. The following keywords were used: pressure injuries, pressure ulcers, wound care, early mobilization, range of motion exercises, interprofessional, collaboration, and hospital-acquired pressure injuries. These resulted in 428 results. The results were further narrowed by including the keywords medical surgical unit and

intensive care unit. Inclusion criteria included peer-reviewed articles, randomized control studies, and qualitative and quantitative reviews within a five-year time frame from November 2017 through November 2022. This review focused on scholarly articles on early mobilization, ROM exercises, risk factors, and pressure injuries.

Risk Factors

HAPIs continue to be a significant health complication for patients and nursing staff (Chung et al., 2022). HAPIs have harmful implications for the patient, which often result in enormous suffering, diminished quality of life, and higher mortality. Several risk factors have been identified that place patients at high risk for developing pressure injuries. A systematic review conducted by Chung et al., (2022) reported that age, decreased mobility/activity, nutritional status, and diseases that reduce sensory perception such as spinal stenosis or peripheral vascular disease place a patient at higher risk for developing pressure injuries. Aghazadeh et al., (2021) agreed after conducting a descriptive cross-sectional analytical study that included 200 patients from four educational hospitals with various medical diagnoses such as diabetes, heart disease, peripheral vascular disorders, pneumonia, and other comorbidities. The study results concluded that the incidence of pressure injuries was higher in patients with immobility, spinal injury, diabetes, and stroke. Both authors agreed that weight, age, exposure to friction and shearing, immobility, decrease sensory perception and exposure to prolonged pressure, and nutritional well-being played a critical role in the development of pressure injuries. Alderden et al., (2017), validated that the elderly, people with diabetes, poor perfusion, poor nutrition, and decreased mobility were at higher risk for developing pressure injuries.

Although immobility is not the primary cause of HAPIs, in combination with other factors can be key to their development (Jaul et al., 2018). A peer-reviewed article by Jaul et.al.

(2018) revealed that immobilization, which is defined as prolonged periods in bed for extended lengths of time, contributes to the development of pressure ulcers or injuries. Liu et al., (2019) also validated that immobility plays a significant role in the development of HAPIs after conducting a multi-center cross-sectional exploratory descriptive study that included 23,985 immobile patients recruited to determine if age, comorbid conditions, or the length of immobility increased the incidence of pressure injuries. The study concluded patients who were immobile for more than 10 days developed pressure injuries. The study validates that immobility is a significant risk factor for the development of pressure injuries.

Interventions

HAPIs are common and unpleasant adverse events occurring in clinical practice affecting the health and well-being of patients and increasing the financial burdens on healthcare systems (Huang, 2021). It is crucial to use an evidence-based reliable assessment tool to identify pressure injuries for early prevention. The Braden Scale is a widely used tool to assess pressure injury risk. A systematic review metanalysis by Huang et al., (2021), where 60 studies were conducted involving 49,326 results indicated that the probability of a positive result was 78% when the Braden Scale was used to assess a person's risk of developing a pressure injury. The Braden scale is an effective tool with moderate validity to assess patient risk for developing pressure injuries. In a peer-reviewed article, Kennerly et al., (2022) indicated that the Braden scale is a valid tool to predict the development of pressure injuries. Huang et al., (2021) and Kennerly et al., (2022), agree that the Braden Scale is the most widely used skin assessment tool and allows nurses the ability to use their expertise to accurately identify patients' overall risk for skin breakdown and pressure injuries. The goal of the Braden Scale is to identify patients who are a risk for developing pressure injuries and prompt the use of appropriate preventative measures

and strategies to prevent pressure injuries. This use of the Braden Scale tool facilitates the appropriate identification of high-risk patients.

Early mobilization has been identified as an effective nursing intervention to avert immobility–related problems and improve patient health outcomes. Multiple authors concluded that early mobilization is essential for reducing HAPIs (Ippolito et al., 2022; Nieto- Garcia et al., 2020). Nieto- Garcia et al. (2020) report early mobilization covers a wide range of interventions, including positioning, ROM exercises, transferring training, and ambulating, and were identified as effective strategies in the reduction of HAPIs. In a systematic review by Nieto- Garcia et al., (2020) the authors further assert that repositioning every two hours can decrease the incidence of HAPIs in problematic areas such as sacral, occipital, scapular, and heels. Additionally, movement, positioning, and early mobilization, along with evidence-based wound care practices can decrease the chances of patients developing pressure injuries and slows the progression of current ulcers (Nieto- Garcia et al., 2020). Early mobilization should include different kinds of movement, ranging from passive exercises understand resistance exercises to active ambulation (Wittmer et al., 2021). The authors noted that the initiation of early mobilization resulted in a 50% decrease in the number of HAPIs.

Exercising improves wound healing, and physical functioning and increases the quality of life of patients (Smith et al., 2018). A randomized control conducted by Hanna et al., (2021), concluded that ROM exercises improved peripheral circulation among patients with type two diabetes. Qui et al., (2022) supported implementing leg, ankle, and foot exercises to significantly reduce pressure injuries. Exercising in combination with a leg compression hose reduced healing time by day number eight (Qui et al., 2022). It was noted the patients with venous pressure

ulcers, who participated in ROM exercises saw a decrease of 67% in the size of ulcers as compared to the ones who did not participate in exercises.

ROM exercises have been proven to be a notable intervention for pressure ulcers. The Chief of Physical Therapy at the local veteran hospital and director of the outpatient service at the county facility in Alabama agreed that ROM exercises are beneficial when they are performed at least two to three times in 24 hours. According to Indrawati et al., (2018), ROM exercise should be performed at least 2-3 times a day to stimulate blood circulation and maintain muscle elasticity.

Using a multidisciplinary team approach to decrease HAPIs is not a new concept or approach. A multidisciplinary/collaborative team care approach for the management of pressure injuries is based on the demand to manage patients with numerous comorbidities and with growing evidence that shared decision-making has benefits on wound healing (Flores et al., 2019). Wound care is a common concern for multiple disciplines, which is why the multidisciplinary/ collaborative approach is effective. In a systematic review by Isaacs et al., (2021), pressure injuries were reduced by 86% when a multidisciplinary and collaborative approach was used. In addition, Clarkson et al., (2019) endorsed that the interprofessional or integrated team approach for pressure injuries prevention is considered the gold standard and best practice. In a randomized study by Alizo et al. (2018), 95 spinal cord injury patients were identified during the pre-implementation phase. These patients who received the multidisciplinary approach-yielded positive results post-implementation. The patients who received the intervention of the multidisciplinary approach had a shorter length of stay, fewer nosocomial infections, and fewer hospital-related complications. This study in agreement with Clarkson et al., (2019) confirms that a multidisciplinary team approach can improve patient

outcomes. The authors further agreed that a multidisciplinary and collaborative approach is the most successful way to manage chronic and serious illnesses.

In summary, the implementation of ROM in pressure injury prevention is proven to be a noteworthy solution for adult and geriatric patients who are at high risk for developing pressure injuries. The fundamental significance of this review was that using the collaborative//multidisciplinary approach is essential in decreasing the incidence of HAPIs. Therefore, the literature supports the implementation of early mobilization such as ROM exercises on a medical-surgical floor.

Theoretical Model

Changes in healthcare organizations will more likely thrive and advance when health professionals are included in the change (Nilsen et al., 2020). The change theory developed by Kirk Lewin who is considered the father of social psychology theory aligns well with changes related to healthcare because it is a precise and easy theory to understand (Nursing Theory, 2022). Lewin's framework provides a basis for promoting individuals within a healthcare system to accept changes that may be necessary, consider possible alterations, and implement the changes in practice or policy (Curley, 2020). This is an opportunity to discuss with the nursing staff the goals and purpose of the project and to address the nurse's concerns with honesty and transparency.

Lewin’s Change Theory consists of three stages unfreezing, changing, moving, and refreezing (Curley, 2022). Unfreezing is the first stage of the theory in which the gap in practice is identified or discovered. The current standard of care for preventing pressure injuries at the student’s residency site includes skin assessment within 24-72 hours of admission, use of the Braden Skin Scale, daily skin assessment, appropriate wound care nursing consults,

repositioning/turning/turning the patient every two hours, selecting surfaces, and the elevation of head and heels. The standard of care also includes prophylactic dressing, no draw sheets, or layers, and using only one absorbent pad. It also includes using devices to relieve and redistribute pressure, incontinence management, and nutritional support. The gap identified is there is no perfusion enhancement such as ROM exercises (early mobilization, activities, or exercise) currently being utilized in the facility or unit.

The second phase of Lewin's Change Theory is changing, moving, or transitioning. This is the transitional phase where nurses receive education, and training and gain knowledge on the importance of ROM in patients who are at risk for developing pressure injuries. The nurse was introduced to an intervention, a new way of doing things and getting away from the status quo. During this phase, the nurses are asked for their opinions and expertise on the subject matter, so they feel like they were included in the project and take ownership of the success. During this phase, the behavior and attitude toward new interventions may be accepted. The student provided the benefit of ROM exercises and how it affects patient outcomes.

The final stage of Lewin's theory is refreezing. In this phase of the theory, the staff moves from the transition phase toward stabilization or acceptance of new policy or practice change. The goal of refreezing is to support change and provide guidance, open communication, and regular feedback to the staff. The final phase of theory is addressing the sustainability of new policy or practice protocol. The Lewin Change Theory supports the success of the implementation of this project. After the completion of the project, the student analyzed, interpreted, and published the results. Based on the positive outcome of the project and supporting evidence, the intervention will serve as a guideline for the other medical-surgical units and expand throughout the hospital including the intensive care units (ICU).

Methodology

Agency Description

The DNP student project site was conducted at a local urban hospital in the southeastern United States whose mission is to provide safe and quality care for the people we serve. The facility is a level 1A acute tertiary medical and surgical care center with nine community-based outpatient clinics (CBOCs) serving over 71,000 in the southeastern United States. The core values focus on the mission of caring with the core values of integrity, commitment, advocacy, respect, and excellence.

IRB Approval Process

Before the initiation of the IRB approval process, CITI training (see Appendix A) had to be obtained. The DNP's project residency site did not constitute research activities. Therefore, a regulatory review was not required and the project was exempted from IRB approval (see Appendix B). The facility's IRB requires attestation form be completed before publication (see Appendix C).The educational facility then granted an exemption from their IRB for the Protection of Human Subjects in Research (see Appendix D).

Setting

This quality improvement project occurred in the 6B, medical–surgical unit. The institution is a local urban institution located in the southeastern United States that is supported by hospitalist physicians, hospital leadership, and frontline staff. The unit provides care for patients with a variety of diagnoses such as diabetes, peripheral vascular disease, hypertension, pneumonia, and cardiac disorders. The average length of stay is five to seven days. The facility has good resources and strong beliefs in creating a safety culture for patients and utilizing evidence-based practice interventions.

Population

The target population for this quality improvement project included all full-time nursing staff on the medical-surgical floor. The sample size of 15-25 staff nurses consisted of all full-time registered nurses (RNs), licensed practical nurses (LPNs), certified nursing assistants (CNAs), and patient care technicians (PCTs). The project is open to both 12-hour shifts which include day and night shift schedules.

Inclusion/Exclusion Criteria for the Population

The quality improvement (QI) project was open to all full-time RNs, LPNs, CNAs, and PCTs staff on the 6B floor. The staff consists of fifteen full-time day-shift nursing staff and twelve full-time night-shift nursing personnel. From the total of twenty-seven nurses, 25 full-time nurses participated. Nurses who are employed to work part-time, for per diem, or on a contract basis were excluded from participation.

Recruitment

A flyer was created, laminated, and placed in high-frequency areas such as the unit break room, nurses' locker room, medication room, computers located at the desk, near the computers on wheels (COWS), and in restrooms on the unit (see Appendix E). The flyer contained information on what the educational session was about and how to contact the project coordinator for questions if needed (see Appendix F). The launch of the project was on February 07, 2023, and concluded on April 10, 2023. The educational session was held on the 6B unit in an empty patient room from February 7, 2023, through February 11, 2023, at various times to ensure all full-time nursing staff received educational training. The DNP student contact information was made readily available in the event a qualifying participant had questions about the project.

Consent

After reviewing the informational letter, each participant was asked to read and sign the Agreement to Participate Form (see Appendix G). The consent form was obtained and collected from all participants before project implementation. It was clearly stated that participation was strictly voluntary. It was also emphasized that the project will be student lead. All participants were made aware that the purpose of the project was to determine if ROM exercises will decrease the incidence of HAPIs. Participants were ensured their information would be kept confidential and facility administration was excused from participation and would not be provided with information concerning who participated. Participants were also made aware that all consent forms would be housed in a locked file cabinet in the preceptor's office. The participants were ensured that their participation would not have barriers to their job, performance evaluation, or promotion opportunities. If at any time the participants felt uncomfortable, they could withdraw from the study without penalty. It was understood that participation would be kept confidential, but the data collected would be published in the DNP manuscript or used for quality improvement.

Project Design

The DNP project will use a quality improvement study design. A quality improvement project improves performance efforts and aids in defining the problem that the quality initiative focuses on (Puri & Tadi, 2022). The basis of this quality improvement project assumes that implementing a range of motion exercise (ROM) will decrease the number of hospital-acquired pressure injuries (HAPIs). This quality improvement project will use quantitative data, including the number of HAPIs from the hospital quality improvement index, and the electronic health record before and after implementation. Initial and weekly chart audits of nurses on the medical-

surgical floor were obtained to monitor nurses on the usage of ROM exercises and documentation.

The first phase of implementation began with inviting nurses on the medical-surgical floor to an educational session that includes all aspects of ROM exercises and pressure HAPIs. The educational session helps the nurses to acknowledge and assess the change in the process needed, allowing them to identify and pass through the unfreezing phase of Lewin's Change Theory, which is also where the readiness for change can be assessed. According to Wojciechowski et al., (2016), this describes the phase where nurses are made aware of the problem, making it possible for the nurses to let go of the old way of thinking and let go of the status quo. The educational session will be a guide in assisting nurses to recognize and understand the need and create a plan (P), the first stage of the Plan-Do-Study-Act (PDSA), to correct the problem using ROM exercises. The educational sessions were conducted over two weeks, including nurses on dayshift, night shift, and weekend shifts. The DNP student provided education and training on how to document electronic health records. The educational sessions allowed time for questions to be addressed and for commitment by nurses to the plan to be assessed. In the phase of the PDSA cycle, the plan of the change is tested, and the who, what, when, and where are collected (Institute for Healthcare Improvement [IHI], 2022).

The second phase of implementation consists of nurses performing range of motion (ROM) exercises and documenting the Braden assessment tool skin score in the electronic medical record to identify the patients at risk. If a patient scores 18 or less on the assessment, the nurses-initiated ROM exercises and documented the wound care assessment tool in the EHR. Nurses move and pass through the change phase of Lewin's Change Theory and the do (D) stage of PDSA by putting the ROM exercises into practice and collecting data to evaluate if the

exercises are successful. Data was collected and documented using Excel and will conclude within eight weeks of implementation.

The third phase of implementation consists of nurses moving into the study (S) phase of the PDSA model by realizing how vital ROM exercises are and the importance of adapting to the new process. The purpose of the study phase in the PDSA cycle is to determine if there was an improvement (Lincoln et al., 2022). The data collected changes the nurses' perception and also allows them to see how beneficial ROM exercises are in decreasing pressure injuries. The (S) phase consists of a weekly chart review to ensure ROM exercises are performed and documented correctly. Re-education will be offered if deemed necessary.

The final implementation phase is where the nurses move through the refreezing phase of Lewin's Change Theory, and the act (A) phase of the PDSA by accepting the new protocol or practice of implementing ROM exercises for hospitalized patients who are at risk for pressure injuries. The goal of refreezing is to support change and provide guidance, open communication, and regular feedback to the staff. In the refreezing phase of Lewin's change theory, the nurses accept the new change in protocol or practice, and it becomes a habit or the new way of doing things (Wojciechowski, et al., 2016). The goal of the (A) phase is to identify how vital ROM exercises are, and the need for a plan of continuous improvement. The nurses were given an update on the project throughout the implementation process and the student elicited feedback on the project, tools, and outcomes. After the completion of the project, the student analyzed, interpreted, and published the results. The management and executive board at this local hospital reviewed the results to determine if the project is sustainable.

Based on the outcome of the project and supporting evidence, the intervention can potentially serve as a guideline to implement ROM exercises and expand throughout the entire

hospital to reduce pressure injuries. One advantage of this quality improvement project is a decrease in the incidence of HAPIs on the medical-surgical floor. Another advantage of this QI improvement project is it will improve patient outcomes and overall satisfaction. Barriers to this QI project were staff resistance to change, non-compliance in implementing the ROM exercises by nursing staff, changes in the nurse manager, and a lack of a standard data entry for documenting the completion of the ROM secondary to administrative delays.

Data Review Process

The integrity of the data must be maintained. The data was extracted from the electronic health records (EHR) on the medical-surgical floor. To maintain the integrity and quality of data an Excel spreadsheet was created. Excel can create graphs, and charts and perform computations that are beneficial in interpreting results and giving final presentations.

Risks and Benefits

There was a minimal potential risk for any nurse who participated in this project. Confidentiality and anonymity were maintained for the project. Careful consideration for the safe initiation of ROM exercises that ensure patient safety was a top priority to mitigate any injuries or harm to patients. The benefits to the staff included improving the standard of care and improving patient outcomes.

Compensation

Light refreshments were offered at each session. Participants received **e**ducational handouts and reminder posters were distributed throughout the unit. The nursing staff that participated in the QA project did not receive any compensation or monetary benefit for participating. No overtime was offered or granted for attendance to any educational training or involvement in any aspect of the project.

Timeline

The timeline outlined an overview of the DNP student project to include planning, development, implementation, and evaluative dissemination. The time was essential as it allowed the principal investigator to plan the project and practice time management throughout the project. The timeline also served as an instrument to assess the needs and changes that were required during the project (see Appendix H).

Budget and Resources

The student incurred minimal costs for refreshments, handouts, and educational materials. The total cost for the implementation of this project was $400.00. The organizational site did not incur any financial expenditure for this project. The training space, staff, visual aids, and technology required to complete education sessions were provided by the facility (Table1).

Table 1

Budget and Resources

Item	**Budget**	**Actual Cost**
Printed Material	$300	$150
Badge cards	$60	$30
Refreshments for Educational sessions(4)	$300	$220
Total Cost:	$660	$400

Evaluation Plan

Statistic Considerations

The paired T-test was used to measure the mean of the characteristics (pressure injuries) among high-risk geriatric and adult patients. The paired t-test measured the same dependent variable (pressure injuries) at two different points in time. A weekly review of charts was done over 3 months before the implementation of the project for patients who had a Braden score of 18 or less. Sixty-five patients were identified during the chart review. During the 2-month

implementation period, fifty-one patients were identified. The ROM exercise intervention was initiated in addition to the pressure injury prevention usual standard of care.

Data Maintenance and Security

Unidentified patient information was collected from the institution's electronic medical records during chart audits. No identifiable information such as name, sex, age, race, or medical records number was collected. The nursing staff were labeled by number, not name to maintain confidentiality. Data was stored on an encrypted USB drive and kept in the DNP office in a locked file cabinet. The DNP student and statistician were the only individuals who had access to data. The data will be kept for less than three years and will be destroyed per facilities and JSU guidelines and policy.

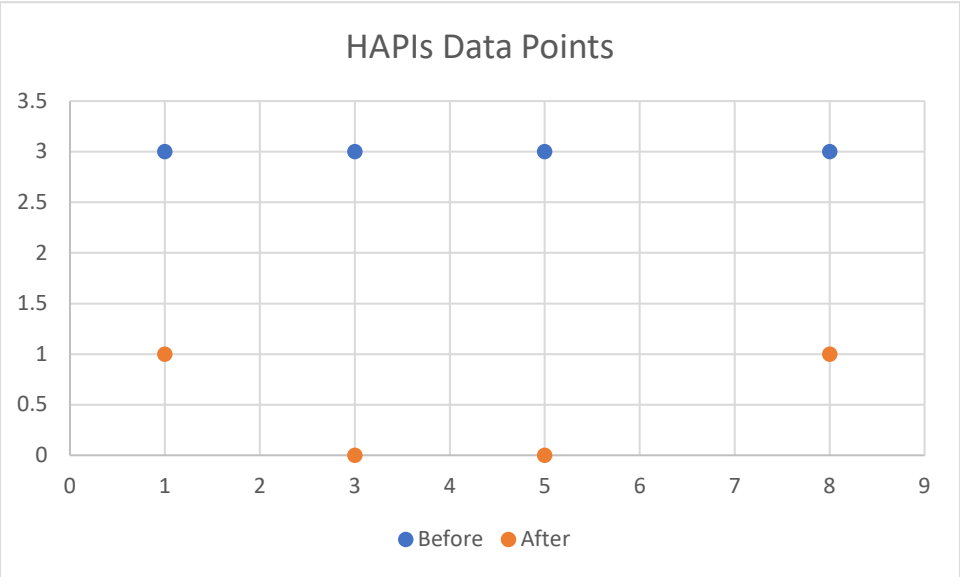
Results

Results of Data Analysis

Over the 8-week intervention period, there were 130 patients identified as having a Braden score of 18 or less. Fifty-one patients were eligible to receive the ROM intervention. Of that number 45% (n=23) received the ROM exercises and 55% (n=28) did not. Over the 12-week pre-intervention period, a total of 3 HAPIs were identified. Results for HAPI was retrieved from daily wound care report and entered and graphed into Excel (Figure 1). After the intervention period, 2 HAPI were found. A paired t-test was performed to analyze the data. Results of the paired-t test indicated that there is a significantly large difference between pre ($M = 3$, $SD = 0$) and post ($M = 2$, $SD = 0$), $t(0) = \text{Infinity}$, $p < .001$.

Figure 1

HAPIs Data Points



Discussion

The results of the DNP project supported a statistically significant and clinically significant reduction in HAPIs (p-value of < .001). Notably, 45% of the nursing staff conducted ROM exercises on patients who were identified as being at high risk for developing HAPIs. The success of this project is related to the nurse's participation. This was largely attributed to the DNP student's enthusiasm for the project, visibility, and hands-on approach. The DNP student made frequent visits to the unit to answer any questions and provided hands-on support and education. Along with being on the unit with the nursing staff, occasionally have conversations with the nurse manager to discuss the importance of implementing ROM exercises in pressure injury prevention.

To ensure the continued success of this project, it will be crucial that executive leadership remains involved. In addition, nursing staffing shortages will need to be addressed. At this level,

nursing engagement and involvement are essential. Providing the healthcare team with additional education and training will be important and necessary to ensure a successful result. This, in turn, increases the patient's chances of having improved health outcomes and quality of life.

Implications for Clinical Practice

The QI project met the goal of decreasing the incidence of pressure injuries on a medical-surgical floor. Using ROM exercises produced favorable outcomes and can be used in other areas of the hospital. For this implementation to be adopted into clinical practice, additional education, more team engagement, and leadership visibility are essential. Additionally, it will be imperative that the multidisciplinary/collaborative approach be used.

Implications for Health Policy

There are several quality measures that hospitals must meet, but there is always room for improvement in the prevention of HAPIs. The Joint Commission (2022) provides guidelines and measures to decrease the number of HAPIs. The Joint Commission recommendations focused on a multi-component approach that includes, thorough skin assessment and inspection, avoiding friction and shearing by positioning, turning, and using transferring techniques. They recommended using a repositing device, mechanical loading, and support surface to reduce skin injury caused by shearing and friction, providing nutritional support, to increase activity and mobility when it is appropriate (The Joint Commission, 2022). The Joint Commission report that pressure injuries are a poor marker of overall health and are a measure of quality improvement safety measures. By demonstrating a decrease in the incidence of HAPIs, the leadership team plans to adopt the use of ROM in the wound care prevention protocol or practice.

Implications for Quality/Safety

In keeping with the mission of the facility to provide quality care to America's heroes it is imperative to use the most updated evidence-based interventions. Quality is defined by AHRQ (2023), as providing care that is efficient, effective, and purposeful for the right person at the right time and yielding the best possible outcome. In addition, safety is the prevention of errors and unpleasant and unwarranted effects on patients. Hospitals strive daily to provide the highest quality care to patients and improve their overall well-being. This QI improvement project exemplifies an overall decrease in the incidence of HAPIs in high-risk patients. The sustainability and implementation of this intervention throughout the organization may reduce HAPIs remarkably.

Implications for Education

Many research articles discussed the importance that education and hands-on training for nurses provide for reducing the incidence of HAPIs. It was apparent throughout this project that ongoing training is essential to develop and execute changes in practice. Healthcare organizations can benefit when they are constantly changing and developing innovative ways to make improvements in patient care. Hospitals have several avenues for training nurses on the prevention of pressure injuries. Using the wound care nursing staff, nurse educators, and continuing education to provide ongoing training is essential. The educational seminar should be offered on units based on needs and competency. Education on the prevention of pressure injuries should be a part of annual evaluations and yearly competency validation and check-off.

Limitations

During the implementation phase of the project, several limitations and barriers were present. One limitation of the project was the short time frame. The project was implemented

over eight weeks, so only short-term goals were assessed. Another limitation was several transitions of nurse managers on the unit during the implementation phase of the project. This caused problems as the staff nurses did not feel supported by leadership and decreased visibility. The nurse manager was not available, secondary to learning and transitioning into a new role and other administrative responsibilities. Another limitation of the project was the limited availability of the physical therapy department. It would have been beneficial to have the physical therapy staff more visible and engaged to address any questions that the staff may have had on ROM exercises.

Other limitations to the study were obtained by the DNP student during a face-to-face encounter about how they thought the project was going. As a result,- of the student conversation, the nurses reported that because of time management, nurse shortage, forgetting, and fatigue, they did not perform the ROM exercises. The nursing staff reported burned out, especially with participation in DNP projects. The DNP was frequently available and hands-on and encouraged to keep spirits high and reminded the staff that this intervention is to improve patient outcomes. The DNP attended the quality meeting, performed wound care rounds, and attended the disciplinary pressure injury committee meeting on the first Wednesday of each month. One limitation noted was resistance to change by the staff, especially the seasoned nurses. Another significant limitation was that the designated data entry for documentation of ROM exercises was delayed by hospital administration and an alternative had to be used.

Dissemination

The senior management, quality management department, various shared governance councils, and committees, along with the wound care team and physical therapist will determine if the results of the data collection by the writer validate implementing ROM in their wound care

prevention protocol. If the decision is made to add ROM to current practice all stakeholders need to be included in decision-making. It is important to have team engagement and open communication with the front-line workers to make the project successful. This ensures that the overall goal of reducing HAPIs is the priority for everyone involved. Based on the favorable outcome of this project the implementation of ROM to decrease the incidence of HAPI can be disseminated to the other medical-surgical floors and ICU.

After the DNP project and after the results have been shared with the stakeholders and the outcomes are favorable, the new intervention can be inaugurated into practice change. The DNP student presented findings to the Quality Review Committee and the presentation and data will be uploaded to the facilities process change memorandum. Additionally, a poster presentation of findings will be presented on Jacksonville State University (JSU) DNP dissemination day which is scheduled for July 13, 2023. After approval from the graduate school a completed manuscript will be added to the JSU repository and hospital IRB database.

Sustainability

The need for pressure injury prevention will continue to be a problem that most acute care facilities face daily. HAPIs are a widespread issue on other medical-surgical floors at this local VA hospital, and this economical (QI) project can tentatively be implemented on another medical-surgical unit with similar high-risk factors and eventually in the ICU.

Plans for Future Scholarship

The literature supported using ROM exercises as a viable intervention for high-risk patients in decreasing the incidence of HAPIs. It will be vital moving forward that the stakeholders and leadership team develop momentum that fosters change. Staff engagement and open communication will be essential. Creating a culture of inclusiveness, civility, and diversity

will allow staff the confidence to share innovative ideas. Also, leadership needs to be more visible and act as an example as the intervention advances toward becoming policy.

Conclusion

The DNP student is saddened that the QI project has ended but is delighted with the fact that the initial implementation of ROM exercises for adult and geriatric patients who are at risk for developing pressure injuries was approved for the DNP project. The concept of implementing early mobilization (ROM) exercise has proven to be statistically and clinically significant. The implementation and conclusion of this project set the foundation for practice and protocol changes that could improve patient outcomes and increase their quality of life.

Though the decrease in the incidence was favorable, additional examination of this intervention is needed, on a larger scale such as a larger medical-surgical floor for a longer period. The student realized even with the best evidence-based QI project, and under perfect or ideal circumstances, eliciting the nursing staff's participation for a non-mandatory DNP lead intervention can be challenging. This issue will need to be addressed by nursing leadership. The objectives and aims of this project have been met.

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Appendix A

CITI Certificate

CITI PROGRAM

Completion Date 16-Aug-2022
Expiration Date 15-Aug-2025
Record ID 50580864

This is to certify that:

ANGELA JOHNSON

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Social and Behavioral Responsible Conduct of Research
(Curriculum Group)
Social and Behavioral Responsible Conduct of Research
(Course Learner Group)
1 - RCR
(Stage)

Under requirements set by:

Jacksonville State University

Verify at www.citiprogram.org/verify/?w285b68ec-63b4-4437-9f99-2931427e5c2d-50580864

Appendix B

Residency Site Institutional Review Board (IRB) Approval Letter

[redacted]

January 12, 2023

[redacted]

Angela Johnson, MSN, RN

[1721161-21 Reducing the Incidence of Hospital-Acquired Pressu
Injuries with an Interprofessional Collaboration Using Range
Motion Exercises

Research/Human Subjects Research Determination

Administrative Review

Determination Decision

Dear Ms. Johnson:

The project listed above was submitted for a determination of whether the project constituted research, and if it did, whether the research was also considered human subjects research LAW 38 CFR
16. After review of the submitted documents, a determination was made that the project:

DOES NOT CONSTITUTE RESEARCH ACTIVITIES because the project is designed for internal [redacted], will not contribute to generalizable knowledge, and is not funded. No further research regulatory review is required. Please contact Quality Improvement for further details on initiating this project.

If you would like to publish or present the findings of your project, please complete the attached ATTESTATION form before publication or presentation.

Any modifications in submitted documents or the addition of new documents could change this decision. [redacted]

Sincerely,

LaTanya Higginbottom
HRPP Administrator

Documents Reviewed:

- Action Plan - Letter to IRB Angela Johnsoncb.pdf (UPLOADED: 01/3/2023)
  Action Plan -Action Plan (UPLOADED: 01/3/2023

Appendix C

Attestation Form

ATTESTATION

Title of Proposed Publication: Reducing Hospital Acquired Pressure Injuries with an Interprofessional Collaboration Using Range of Motion Exercises

Author Attestation: Angela M. Johnson

As an author of the publication referenced above (copy attached), I attest that the findings reported in the publication were not derived, in whole or in part, from activities constituting research as described in VHA Handbook 1058.05.

(Provide for each VA Author and Co-Author)

Author Signature: Angela Marie Johnson Date: 07/11/2023

Author Name: Angela Marie Johnson VA Duty Station: 521

Author Signature: _____ Date: _____

Author Name: _____ VA Duty Station:

Reviewing Official:

_____ Date: _____

Jacob Kepins, Research Compliance Officer

Designated Official:

Name: _____ Date: _____

Title: Medical Center Director

Program Office or Facility: Birmingham VA Medical Center

*****VA signature pending JSU approval******

Appendix D

Jacksonville Institutional Review Board (IRB) Approval Letter

INSTITUTIONAL REVIEW BOARD
JACKSONVILLE STATE UNIVERSITY

Institutional Review Board for the Protection of Human Subjects in Research
249 Angle Hall

700 Pelham Road North

Jacksonville, AL 36265-1602

November 1, 2022

Angela Johnson

Jacksonville State University Jacksonville, AL 36265

Dear Angela:

Your protocol for the project titled Reducing the Incidence of Hospital Acquired Pressure Injuries with an Interprofessional Collaboration Using Range of Motion Exercises" protocol number 11012022-01 has been granted an exemption by the JSU Institutional Review Board for the Protection of Human Subjects in Research.

If your research deviates from that listed in the protocol, please notify me immediately. One year from the date of this approval letter, please send me a progress report of your research project.

Best wishes for a successful research project.

Sincerely,

Je ifer Mead

Senior Human Protections Administrator, Institutional Review Board Phone: 256-782-8144 • Fax: 256-782-8146 • www.jsu.edu • An Equal Opportunity I Affirmative Action Employer

Appendix E

DNP Recruitment Flyer 1

ROM

THAT IS THE QUESTION?

Please join us for educational training on range of motion exercises(ROM) and the prevention of hospital-acquired pressure injuries).

When: February 1-2, 2023

February 6,7,8 & 9, 2023

Where: 6B conference room

Time: 7am, 8am,1100am, 2pm, 3pm, 6pm, 6:30 pm, 1100 pm

Who: Nursing Staff 6B

Sponsored by: Physical Therapy Department

Wound Care Nursing Staff

Jacksonville State University Graduate Nursing- DNP student Angela Johnson, MSN, RN

Please contact Angela Johnson for any questions or concerns at 205.276.6817

Appendix F

DNP Recruitment Flyer 2

Hospital Acquired Pressure Injury(HAPI's) and range of motion exercises (ROM)

Please join us for an exciting educational training on hospital-acquired pressure injury prevention using range of motion (ROM)exercises.

When: February 1-2, 2023

February 6,7,8 & 9, 2023

Time: 7am, 8am,1100am, 2pm, 3pm, 6pm, 6:30 pm, 1100 pm

Where: 6B Conference Room

Attended audience: Nursing Staff on 6B

Sponsored by: *Physical Therapy Department*

Wound Care Nursing Staff

Jacksonville State University, DNP student Angela Johnson

MSN, RN

Please contact Angela Johnson for any questions or concerns at 205.276.6817.

Appendix G

Participants Consent Form

INFORMED CONSENT FORM

Study Title: Reducing the Incidence of Hospital-Acquired Pressure Injuries with an Interprofessional
Collaboration Using Range of Motion Exercises
Principal Investigator: Angela Marie Johnson, MSN,RN
Email Address and Phone Number: 0898H@stu.jsu.edu and 205.276.6817

The Purpose of This Study

This study aims to decrease the incidence of hospital-acquired pressure injuries (HAP I's) in a medical-surgical unit.

What Is This Study Procedure?

In this, the participants(nurses) will be recruited from the 16-bed medical-surgical unit after attending an informational seminar on the project. This seminar will include basic information on pressure injuries and range of motion (ROM) exercises information and the important role the nurses play in the success of the project. Education and training for all nursing staff on the medical-surgical unit by the physical therapy department in late November after IRB approval and nurses have consented. Training will include a range of motion exercise instructions by the physical therapy staff and instructions on documentation guidelines. All skin assessments will be reviewed on new admission on medical surgical floors (within 24-72 hours). identify at-risk patients: Braden score S18, spinal cord injuries, limited mobility, decreased sensation disorders (i.e., diabetes, neuropathy, and arterial disease will be enrolled in a pilot study to receive the intervention of ROM exercises along with hospital pressure injury prevention measures (Skin Bundle). A nursing documentation entry will be added to the hospital skin assessment charting tool for nurses to document compliance with ROM exercises on at-risk patients. Continue using the current audit tool to assess, evaluate and monitor skin and high-risk areas (bony prominence). A weekly chart review during the implementation phase of the study will be performed to evaluate project progress and to identify any barriers or issues that may need to be addressed. A retrospective review of medical records and quality/ patient safety reports will be conducted by DNP students over 8 weeks.

Where Will This Study Take Place?

This study will take place at a local urban hospital in southeastern United States on the 6B medical-surgical floor.

How Long Will You Be in The Study?

If you decide to be in this study, your total participation should last no more than 85 minutes to review the new policy, attend educational training, a complete range of motion exercises,

and complete documentation in electronic health records (EHR). The project will last for twelve weeks.

Are There Risks To You IT You Participate?

There are no risks to participants. Participation is not mandatory and will in no way affect your job assignment or performance evaluation. You may decline participation at any time during the DNP Project and not suffer any retribution, retaliation, or harm should you wish to withdraw from the DNP Project.

How Will I Protect Your Privacy and Confidentiality?

The information you provide for the study will be kept confidential by the use of unique identifiers for any potentially identifying information. The principal investigator will collect all data and the data will be stored on the principal investigator's USB drive with a secured pin to access. Any handwritten data will be kept in a locked office and file cabinet in the preceptor's office. The principal investigator will only have access to a key to a locked file cabinet. Data will be shredded 3 months after project completion. In any written reports or publications, your name will not be used only your unique identification number.

What are the Benefits of this study?

The benefits of this study include decreasing the number of patients who are admitted to the unit from being diagnosed with hospital-acquired pressure injuries (HAPIs).

INFORMED CONSENT FORM

Is Participation Voluntary?

Your participation in this study is voluntary. You can say no or stop participation at any time. There will be no penalty to you. It will in no way affect your job assignment or performance evaluation. If you want to stop participation, please notify me immediately by email or phone at the email address or phone number listed on the top of the first page of this form indicating your intent to withdraw from the study.

Do You Want To Participate In This Study?

Your signature below shows you have read this form. You have had time to ask questions about this study. I have answered your questions. You voluntarily agree to be in this study. You understand that you can stop participation at any time. You will get a copy of this consent form for your records.

_____ _____

Print Name of the Participant Date

_____	_____
Signature of Participant	Date

Appendix H

Project Time Line

Task 2022	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
• Project Planning • Site Selection • Problem Statement	**X**							
• 1st needs assessment/Gap Analysis • Stakeholder meeting • 2nd needs assessment/Gap Analysis		**X**						
• Project Scope • 3rd needs assessment/Gap Analysis • Stakeholders Meeting			**X**					
• Project Goal/needs identification • Best Practice Guidelines • Stakeholders Meeting • Identify Project Team Members • Initial PICOT • Final PICOT • Draft Proposal			**X**					
• CITI training				**X**				
• Final Literature Review					**X**			
• IRB Approval							**X**	

• Agency letter of support and project site approval								
• How to Incorporate Assessment Tools in EHR • Develop Staff Education • Identify any patient education needs • Develop data report to monitor compliance • Stakeholders Meeting								**X**
Task **2023**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**
• Educate Staff on the PILOT process • Stakeholders Meeting	**X**	**X**	**X**					
• Final PILOT Implementation • Data Collection • Data Analysis • Stakeholders Meeting				**X**	**X**			
• Final Manuscript • Project Dissemination • Final Presentation • Electronic Portfolio Submission						**X**	**X**	**X**