Using Education and a Prevention Protocol Tool to Decrease the Incidence of Pressure Ulcers in a Nursing Home

Kristina L. Scalzitti
Valparaiso University

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USING EDUCATION AND A PREVENTION PROTOCOL TOOL TO
DECREASE THE INCIDENCE OF PRESSURE ULCERS IN A NURSING HOME

by

KRISTINA L. SCALZITTI, MS, FNP, NP-C

EVIDENCE-BASED PRACTICE PROJECT REPORT

Submitted to the College of Nursing and Health Professions

of Valparaiso University,
Valparaiso, Indiana

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For the degree of

DOCTOR OF NURSING PRACTICE

2015
DEDICATION

When I look back to where I have come from and where I am today, I have grown immensely as a Nurse Practitioner, within my career and my education, as well as a person. I am thankful for such a wonderful, supporting family as I finish the highest degree in the nursing profession. Thank you to my husband Joe for being supportive when I decided to go back to school just three months after having our son. Since I started LPN school 15 years ago, he has been encouraging me to continue on and do my best. A big thank you to my parents for always encouraging me and supporting me in my decisions. Thanks to my loving dad, who I strive to make proud. When my nursing career started as an LPN he was the one who pinned me and now will see me walk to accept my Doctorate. A plaque given to me by mom stating “she believed she could and she did” has been next to my bed motivating me throughout the last few years. Well mom, I believed I could and I did! Also, I appreciate all the help my mom did with proof reading all my papers since LPN school. I have grown as a writer and you as an editor. Finally, a special thank you to my daughter Sophia for understanding when I had to do homework and could not play. I hope I have been a good role model as a mom and career woman with showing that you can do anything you put your heart and mind to. To baby Michael who was three months old when I started this program and now 22 months old, we did well with our midnight feedings and late night writing together in the baby Bjorn or bouncy seat next to me. I love you all very much. This has been worth all the sacrifice with late night writing and long hour weekends doing homework. I love the nursing profession with the diversity in degrees and fields, the history, the passionate caring, and how nurses make a difference in patients’ lives, the medical field, and community as a whole. I am proud to say I am a nurse and part of an elite group of professionals with my Doctorate.

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ABSTRACT

Over 1.3 million persons are residents in nursing homes (NHs); one in ten have pressure ulcers. The purpose of this evidence based practice project was to determine if implementation of a pressure ulcer prevention tool, along with staff education, decreases the incidence of pressure ulcers within the NH. Florence Nightingale’s Environmental Model and the Stetler Model were used to guide this project. The setting was a NH in northwest Indiana. Eleven nurses attended a 15 minute educational session on pressure ulcer prevention and implementation of the Pressure Ulcer Prevention Protocol Intervention (PUPPI) tool. PowerPoint slides were distributed and flyers about the PUPPI tool were posted. The PUPPI tool consists of several areas: sensory perception, moisture, activity, mobility, nutrition, and friction and shear. The tool was utilized three times a week for 12 weeks, in addition to current practice, for patients with a Braden score of 18 or below. Pressure ulcer rates were collected four month retrospectively, during the intervention, and two months post intervention. Analysis of data was done using descriptive statistics with SPSS and Microsoft Excel. Two months post-intervention, total pressure ulcers rates (n=40) were considerably different from 2014 (n=58) showing a positive outcome with a downward trend in rates of wounds. Stage IV pressure ulcers from 2014 showed a significant decrease two months post-intervention (t(4)=3.333, p<0.05). There was a statistically significant decrease by 50% in facility acquired pressure ulcers from to 2014 (n=18) to two months post-intervention (n=9) (t(3)=2.306, p<0.05). Also, the total number of patients with facility acquired pressure ulcers were statistically significant decreased from 2014 (n=16) by over 50% two months post-intervention (n=7) (t(3)=3.220, p<0.05). The relationship between 2014 (r(39)=.296, p>.05) Braden scores and albumin levels and two months post (r(39)=.282, p>.05) showed a weak correlation with no significance. All participants who completed the post intervention survey (n=8) felt the educational session and the PUPPI tool were beneficial
to pressure ulcer prevention, with the majority recommending adding the tool to daily practice. Prevention of pressure ulcers with protocols, education, and assessment tools, improves patient outcomes with a decrease in the incidence of pressures ulcers.

*Keywords:* nursing home, pressure ulcer, wounds, ECF, education, protocols, prevention, nurse
CHAPTER 1

Introduction

Background

Within the United States, 12.7% of the population is over the age of 65, with an estimated population in 2013 of 316,128,839 people (United States Census Bureau, 2013). The older population in 2030 is projected to be twice as large as their counterparts in 2000, growing from 35 million to 72 million, and representing nearly 20 percent of the total U.S. population (Federal Interagency Forum on Aging Related Statistics, 2012). The estimated population for Indiana is 6,570,902, and 13.6% of those are 65 years or older (United States Census Bureau, 2013). The number of Indiana residents age 85 and older is expected to grow by 48% by 2030 (American Association of Retired Persons [AARP], 2009).

According to the National Center for Health Statistics (NCHS) 2013, there are 15,700 nursing homes (NH) in the United States which represent a total of 1,669,100 million beds. Currently, there is an 86% occupancy rate with 1,383,700 million residents residing in NHs (Centers for Disease Prevention and Control [CDC], 2013). There is an average length of stay of 835 days since admission (CDC, 2013). The Midwest has the largest supply of NH beds (National Center for Health Statistics [NCHS], 2013). There are approximately 952,100 full time equivalent (FTE) nursing staff employees, including nurses and aides, working in NHs (NCHS, 2013). The NCHS (2013) stated that of those 952,100 FTEs, 65.4% are aides, 22.9% are Licensed Practice Nurses, and 11.7% are Registered Nurses.

According to Centers for Medicare and Medicaid Services (CMS) (2012), pressure ulcers of Stage II or greater were present in 5.9% of NH residents in the United States. There was a 5.3 % occurrence of such ulcers in Indiana. More than one in 10
NH residents in the United States have a pressure ulcer (NCHS, 2009). In 2011, 21% of NHs in Indiana failed to prevent and treat pressures ulcers Stage II or greater (CMS, 2012). Residents of NHs for a year or less were more likely to have pressure ulcers than those with longer stays (NCHS, 2009). In Northwest Indiana, there are 10 nursing homes in Porter County and 20 in Lake County. With such important issues and statistics, there needs to be a change with the current standard of care regarding prevention of pressure ulcers in long-term care.

Defining Pressure Ulcers

As part of the physiological aging process, older adults have dry, fragile skin with a loss of turgor and elasticity, which predisposes them to skin irritation or breakdown (Hunter, Anderson, Hanson, Thompson, Langemo, & Klug, 2003). In fact, the epidermal layer, composed primarily of keratinocytes and stratum corneum, decreases by half by age 80 years (Hunter et al., 2003). Pressure ulcers are localized injury to the skin, underlying tissue, or both usually over a bony prominence, as a result of pressure or pressure in combination with shear (National Pressure Ulcer Advisory Panel, [NPUAP], 2007). There are five main factors for prevention of pressure ulcers: hydration, nutrition, support surfaces, skin care, and risk assessment. Also, there are four stages of pressure ulcers. Stage I is intact skin with non-blanchable erythema of a localized area usually over a bony prominence (NPUAP, 2007). Stage II is a partial thickness wound with loss of dermis presenting as a shallow open ulcer with a red, pink wound bed, and without slough, but may also present as an intact or open/ruptured serum-filled or serosanguinous filled blister (NPUAP, 2007). Stage III are full thickness skin loss with subcutaneous fat visible, but bone, tendon, or muscle are not exposed, and slough may be present but does not obscure the depth of tissue loss (NPUAP, 2007). Stage IV are wounds with full thickness tissue loss with exposed bone, tendon, or muscle with possible slough or eschar present (NPUAP, 2007). There is often undermining and
tunneling, and can extend into muscle and/or supporting structures such as fascia, tendon, bone, or joint capsule making osteomyelitis likely to occur (NPUAP, 2007). Finally, Unstageable wounds include wounds with bruising that indicate deep tissue injury and wounds with eschar or gangrene.

**Evolution of Nursing Homes**

During the Industrial Revolution, there was a growing number of elderly, single, and widowed people. Prior to this time, elderly were taken care of by families. As cities grew, families became more spread out, resulting in elderly residing in almshouses (USLegal, Inc, 2014). In 1880, one third of the residents of almshouses in the United States were elderly, and by 1923, two thirds were elderly (USLegal, Inc, 2014). During the 1930s, the Social Security Act of 1935 was initiated and things began to change for the elderly. Those on Social Security were mandated where to live: private versus public homes. During that time, private facilities were not regulated by the government, which meant that they were poorly run, dirty, overcrowded, and not specific to patients’ needs. Public facilities were government regulated and only the truly indigent could stay in public homes (USLegal, Inc, 2014).

Furthermore, by the 1950s, Congress realized that the situation needed to change, and the Social Security Act was amended so that recipients could be eligible for residence in public facilities (USLegal, Inc, 2014). In 1965, the development of Medicare and Medicaid services provided regulation on NHs with the first set of standards of care established in 1967. Congress has revised the standards of care numerous times to help ensure the best care is provided to the residents. Today, there are strict guidelines and regulations that need to be followed to maintain certification with insurances and the government. The treatment of pressure ulcers is included in these guidelines. With the increasing number of elderly individuals, nursing homes will be the way of life for many.
This will lead to higher risk for development of pressure ulcers; therefore protocols for prevention need to be current.

**Statement of the Problem**

Evidenced based practice (EBP) describes a model of care whereby Advanced Practice Nurses, using current evidence or research knowledge, make decisions using clinical expertise and patient preferences to guide patient care. The highest quality of health care is delivered with the best outcomes. The problem this EBP project will address is the prevalence of pressure ulcers within nursing homes, and the best evidenced based practice for prevention.

**Purpose of project.** The purpose of this EBP project was to determine if implementation of a pressure ulcer prevention tool along with staff education decreases the incidence of pressure ulcers within the NH. The overall goal of this EBP project was to decrease pressure ulcers by using preventative measures. To achieve this goal, a prevention tool for pressure ulcers was introduced. In EBP, clinical questions are asked in a certain format called a PICOT question, which pertains to the population, intervention, comparison, outcome, and time to yield the most relevant and best evidence (Melnyk & Fineout-Overholt, 2011). The PICOT question addressed for this EBP project was: *In older adults living in a nursing home, what is the effect of a pressure ulcer prevention tool and staff education, compared to usual care, on the incidence of pressure ulcers over a three month period?*

**Clinical significance.** One in 10 NH residents in the United States have pressure ulcers (NCHS, 2009). With such a high prevalence of wounds in NHs, there needs to be a change in education and training to reduce the incidence of pressure ulcers and prevent them (Bangova, 2013; NCHS, 2009). Treating wounds is 2.5 times more costly than preventing them (Catania, Huang, James, Madison, Moran, & Ohr, 2007; JBI, 2008; Vap & Dunayev, 2000). Implementation of a protocol, along with staff
education, reduces the incidence of skin breakdown, including pressure ulcers (Bangova, 2013; Buss et al., 2004; Catania et al., 2007; EPUAP & NPUAP, 2009; Hunter et al., 2003; Slade, 2013; Tippet, 2009).

**Data from the literature supporting the need for the project.** Historically, pressure ulcers have been documented for thousands of years, with early descriptions in autopsies of Egyptian mummies (Tippet, 2006). Development of a pressure ulcer can result in serious outcomes including pain, infectious complications, prolonged and expensive hospitalizations, persistent open ulcers, psychological harm, and increased risk for mortality (Tippet, 2006). When patients are in bed and immobile, the source of external pressure can be a bed surface, tight bedcovers, or pressure and friction generated when the legs become restless (Bangova, 2013). Prevalence of pressure ulcers in NHs within the past two decades has nearly doubled, increasing overall from 9.2% in 1989 to 15.5% in 2003-2004, and nosocomial prevalence increasing from 5.6% to 10% (Tippet, 2009). Globally, as of 2010, pressure ulcers resulted in about 42,600 deaths, which is a 32.5% increase from 1990 (Lozano et al., 2012).

**Data from the clinical agency supporting the need for the project.** The nursing home where this project took place is located in northwest Indiana, Duneland community. The facility being used has been serving the Duneland communities, including the towns of Chesterton, Burns Harbor, Porter, and Beverly Shores, as well as the Indiana Dunes, since 1985. They take pride in their mission to be committed to creating an environment that makes its residents feel they are part of a caring family. Residents and families can have peace of mind knowing they are safe and well cared for by a dedicated and compassionate team. According to CMS (2013), the overall rating for this NH is 1/5 stars. (One is the lowest rating and five is the highest). The rating for staffing is 1/5 stars, health inspection is 2/5, stars and quality measures is 3/5 stars.
According to Gabel (2001), it ultimately is the leader’s responsibility to develop the organization’s ability to anticipate, create, and/or react to change possibilities or requirements in a manner that will enhance the function of the organization and further the development of its mission. Positive attitudes, longevity of the staff, and the directors of nursing’s willingness for implementing evidenced based practice change is important. Good leadership is essential in any organization, and leaders should establish a culture that accepts and embraces the need for change. The culture of this facility is one that welcomes change and creates an enlightened approach to providing healthcare, and is highly regarded and widely known for providing comprehensive, individualized care within the healthcare community. However with strict state requirements still score low on the star rating systems and have room for improvement. Employed are Registered Nurses, Licensed Practical Nurses, Certified Nursing Assistants, Physical, Occupational, and Speech Therapists, Social Workers, and Nutritionists, all of whom share a common goal of providing quality health care.

Furthermore, customized care plans are created for each resident which address the needs and wishes of the resident and his/her family, and include everything from medical requirements to personal dietary preferences, while also ensuring residents receive the specific care that they require. These care plans are designed to utilize all of the resources and services that they have to offer, are reviewed on a regular basis, and are modified to meet each individual's specific goals.

Additionally, the NH is a limited liability corporation and a for-profit corporation. It is a non-multiple nursing home ownership (UCompareHealthCare.com, 2014), and it participates in Medicare and Medicaid insurance programs. The population served consists of mainly elderly individuals, but the NH can provide care for the adult population for short or long term care. Residents with intellectual disabilities, rehab patients of different ages who are working toward the goal of returning home post-
discharge, and the elderly who need assistance with activities of daily living may also reside at a NH for long term care. It is a one-floor facility, with the capacity of 100 residents. There is easy access to all areas with a centralized nurses’ station available to all residents for assistance.

Importantly, an internal force that impacts the nursing care is the nurse to patient ratio, which, according to CMS (2013) is 1 hour and 6 minutes per resident, per day, which is below average. In comparison, the average for Indiana is 1 hour 50 minutes, and the national average is 1 hour and 38 minutes (CMS, 2013). Also, the Registered Nurse hours per resident per day is 32 minutes at the facility, 50 minutes for Indiana, and 48 minutes for the national average (CMS, 2013). This is valuable time missed for pressure ulcer prevention. In addition, the percentage of short stay residents with pressure ulcers is 1.3%, which is comparable to the nation. It is lower than Indiana’s rate of 1.6% (CMS, 2013). However, long term residents’ percentage of pressure ulcers is 6.7%, compared to Indiana at 6.8%, and a national average of 6.2% (CMS, 2013). There is still room for improvement in pressure ulcer prevention based on these statistics. Even a tenth of a percentage improvement means fewer wounds, less chance for infection, less pain associated with wounds, fewer financial concerns with wound care, less deficiencies with health inspections, less staff time spent on wound care, and increased productivity and improved quality of care and patient interactions.

In addition to internal forces, there are external forces such as health inspections that impact the facility. The last health inspection was performed in May of 2013. They had a total of 16 deficiencies in their last inspection, compared to the Indiana average of 7.7 and national rate of 6.8 (CMS, 2013). They have not received any penalties or payment denials in the last three years according to CMS (2013).

Overall, the prevention of pressure ulcers will increase the quality of care which will lead to improved quality of life and health. The impact would be great on the
population of the residents in NHs with less wounds, pain, distress, and risk for infection. Also, there would be a monetary benefit due to less money being used for wound care, and fewer deficiencies with health inspections as well.
CHAPTER 2

Theoretical Framework and Review of Literature

For this EBP project, a Pressure Ulcer Prevention Protocol Intervention (PUPPI) tool was utilized, along with education to the NH nurses about pressure ulcer prevention. The PUPPI tool was used daily with assessments, during a three month time period. The PUPPI tool used was derived from a preexisting tool developed for another research project in 2007. This case-control study took place in the James Cancer Hospital at Ohio State University Hospital, showing good results with a decrease in pressure ulcers by over 50%, within three months. They were able to maintain percentages well below the national benchmark on hospital acquired ulcers at 2.9% and below after the initiation of this tool. Prior to implementation, the all pressure ulcer rate was at 11.1%, with hospital acquired at 6.6%, and after implementation all pressure ulcer rate at 4.1%, with hospital acquired at 2.0%. The author contacted the creator and researcher who granted permission to use the tool and make any changes deemed fit. Since it was initially used in a hospital setting, this author made some adjustments to work within the nursing home (NH) atmosphere.

Furthermore, this tool had several areas addressing sensory perception, moisture, activity, mobility, nutrition, and friction and shear. The education was directed toward the importance of utilizing of this tool for pressure ulcer prevention. The Advanced Practice Nurse (APN) implemented the tool and educational material while applying a nursing model and the conceptual framework to guide this EBP project. The nursing model that was utilized is Florence Nightingale’s, Environmental Model, with the Stetler Model as the EBP model.
Nursing Theory

Florence Nightingale’s Environmental Model. Florence Nightingale was born in Florence, Italy in 1820 to a wealthy aristocratic family. She came of age during the Industrial Revolution in Victorian England, with factories, towns that were overcrowded with slums and filth, leading to an increase in infectious diseases. Wealthy Victorian women, with a desire to pursue a career, was not common, especially a career in nursing, as it was considered a lowly occupation. While traveling, she went through several months of nurses’ training and secured a job as a superintendent of a hospital for women in 1853 (Salotti, 2003). During the Crimean War, she and a team of nurses improved the unsanitary conditions at a British base hospital, reducing the death count by two-thirds and decreasing the incidence of infected wounds sustained in battle (Biography, 2014). Most infections arise spontaneously from poor environmental conditions (Nightingale, 1859/2003). When she returned from war, she placed emphasis on preventative health as she taught nursing students to focus on their observational skills. Furthermore, Nightingale changed the public’s image of nursing and made it a respectable career.

Moreover, Nightingale viewed the manipulation of the physical environment as a major component to nursing care (George, 2003). The development of the Environmental Model came about from her work, *Notes on Nursing*. Environment is defined as the surrounding matters that influence or modify a course development. (Weber, 1991, as cited in George, 2003). Nightingale identified 13 areas to be addressed for prevention of illness and for health-oriented care (Fitzpatrick & Whall, 2005). Those areas included health of houses, ventilation and warming, light, noise, variety, bed and bedding, cleanliness of rooms and walls, personal cleanliness, nutrition, taking food, chattering hopes and advices, observation of the sick, and social considerations (see Figure 2.1). These 13 environments center around the patient, with
the nurse, as an observer, around the environments. When an area is in stress or out-of-balance, it will affect the patient, which will impact the environment, further effecting the patient.

*Figure 2.1* Florence Nightingale’s Environmental Model

**Application to the project.** Implementation of a pressure ulcer prevention tool entails several areas of assessment which are all included within Nightingale’s Environmental Model. Environment is stressed as an important concept within this Model. Environmental aspects of care have several application to this project. An important concept within her theory includes bedding and clean sheets. With prevention of pressure ulcers, having clean bedding is important to prevent debris in wounds, especially pressure ulcers within the sacral, pelvic, ischium, trochanter, and coccyx area. When a patient has soiled linen, it is important to change the linen to keep the areas free and clear of any foreign material in order to prevent it from entering the wound and
contaminating it. Another factor is the bed as a whole. Providing the proper and necessary support surface is a vital factor for wound prevention. Utilizing a waffle mattress or a low air loss mattress helps prevent pressure ulcers in high risk patients.

In addition to clean linen, the concept of personal cleanliness is observed through bathing. Within the nursing home, there are scheduled bath days which are essential for good hygiene. Also, when needed, patients within nursing homes, are provided proper care associated with bowel movements and incontinence. Providing this care quickly and efficiently prevents pressure ulcer formation with skin breakdown. Applying skin barrier cream after care is given will aid in prevention of skin irritation as well as for cleanliness.

Another key concept is nutrition. Adequate nutrition, an albumin level of 3.5 g/dl or greater, is important for optimal pressure ulcer prevention (Catania et al., 2007; Serpa & Santos, 2014). An albumin level less than 3.5 g/dl is a clinically significant predictor for pressure ulcers (Serpa & Santos, 2014) Looking at patients’ albumin levels and initiating supplements, encouraging eating, and stimulating appetite if needed, is essential in pressure ulcer prevention (Catania et al., 2007; JBI, 2008; EPUAP & NPUAP, 2009; Serpa & Santos, 2014). Involving the dietitian is another component to adequate nutrition. Hydration is also important to maintain good skin integrity and to prevent breakdown.

Several more concepts include cleanliness of the environment as a whole, ventilation, lighting, and noise. Providing a clean environment that is well ventilated, and has adequate lighting is conducive to the healing process. Proper ventilation and temperature are important for wound prevention. Monitoring the temperature within a patient’s room will prevent sweating as in warmer rooms. Hunter et al. (2003) found that drier skin may be present during winter months when humidity is low, and higher skin breakdown in warmer months with higher humidity. This can be especially true within
the elderly population, as they tend to prefer a warmer climate, which could lead to moisture and subsequent skin breakdown. Adequate lighting is essential in order to accurately examine the skin for identification of skin breakdown. With improper lighting, a Stage I pressure ulcer could be missed which could result in further breakdown. Noise reduction is important for adequate sleep, because patients need rest to heal and gain their strength. This improves their activity level, which ultimately decreases their risk for pressure ulcers.

Another concept within the Environmental Model is entitled chattering hopes and advices. This concept refers to providing good information in order to assist with healing and to avoid false hope. The nurse should provide encouragement to move, reposition, and eat, which helps prevent pressure ulcers.

Furthermore, the concept of observation of the sick is essential for the nurse caring for the patient. As stated by Nightingale (1859/2003), "the most important practical lessons that can be given to nurses is to teach them what to observe, how to observe, what symptoms indicate improvement, what the reverse, which are of importance, which are of none, what are the evidence of neglect, and what kind of neglect" (p. 88). With education on pressure ulcer prevention and assessment, the nurse will utilize his/her observational skills and implement proper tools for prevention.

Finally, the concept of social considerations is addressed, with influence on pressure ulcer prevention. Looking at the patient’s home environment is vital upon discharge. If the patient is at high risk for pressure ulcers and there are plans for discharge to home, the environment needs to incorporate the same concepts followed at the nursing home and promoted by Nightingale’s Environment model. Home health and visiting nurses are an important extension of this concept.
Conceptual Framework

Stetler Model. Originally developed in 1976 as the Stetler/Marram Model, the Stetler Model’s focus is on individual practitioners putting evidence based research into practice. It has undergone three revisions, and in 2001, it became related to the concept of EBP nursing. In 2009, it was modified to better clarify the role of supplemental evidence and implementation tools and is known as the practitioner-oriented model (Melynyk & Fineout-Overholt, 2011; Schmidt & Brown, 2012). The Stetler Model gives step-by-step instructions for integrating research into practice. It provides an excellent framework for implementing evidence into practice (Romp & Kiehl, 2009). This model serves as a foundation for this EBP project.

To explain, there are five phases associated with the Stetler Model; preparation, validation, comparative evaluation with decision making, translation and application, and evaluation. Phase I consists of defining and affirming a need for EBP, reviewing content, organizing work load, and initiating a search for evidence. During phase II, assessment of the body of evidence is done by critiquing research found, then choosing and summarizing evidence as it relates to need. Phase III is applying a set of utilization criteria to evidence, labeling, condensing, organizing, and attributing meaning to all evidence collected. In addition, making decisions related to fitting within a setting, feasibility, substantiating evidence, and current practice is also performed. Phase IV is translating or applying the research to a practice setting, converting findings into the type of change to be made or recommendations to be given, and adopting the implementation of evidence based findings. Finally phase V is evaluating the plan after implementation by using a tool that measures outcomes of change, goal achievement, and cost.

Furthermore, for this EBP project, a plan has been devised according to the Stetler Model and following the five phases. First, a need was identified for ways to
prevent pressure ulcers in NHs by the above national average statistics. The workload was done by an APN. Also, a search was done on the research question about pressure ulcer prevention and the effectiveness of staff education and implementation of a prevention tool. Implementing a change consisted of reviewing current practices for pressure ulcer prevention and current evidence. Secondly, the APN critiqued and summarized the research to apply the most credible, valid research available. Thirdly, organization of the literature was done and decisions were made on which articles to best be utilized within the project.

Fourthly, developing an educational session to be conducted to the nursing staff and implementing the PUPPI tool was carried out. Educating the nurses on the PUPPI tool and prevention of pressure ulcers is important for compliance and prevention. Lastly, evaluating the effectiveness, cost savings, patient safety, ease of use with staff, and most importantly the reduction in the rate of pressure ulcers was performed. Around three months after the implementation, the rate of pressure ulcers were evaluated after using the prevention tool and provided education. Evaluation was done by reviewing charts, assessing the rate of pressure ulcers the same four months the previous year before the change, and the three month period after during the change, and two months after the change. In addition to educating the nursing staff, a survey tool was utilized upon completion of the three month period to assess the ease, effectiveness, and overall opinion of the tool. There are monthly meetings for the nursing staff where the PUPPI tool was suggested to be discussed, education regarding the implementation, and questions could be answered.

Finally, these types of interventions would work well within any NH. Quality of care and patient safety are important factors to consider as well as pressure ulcer prevention. By implementing a change, the quality of care is enhanced, due to the increased time attention spent on several key factors for prevention. These factors include skin care,
nutrition, hydration, risk assessment, and support surfaces. By ensuring these areas are met to the fullest, there is an improvement in patient safety by preventing infection and pain, and increasing quality of life, mentally, emotionally, and physically. Not only nursing compliance is important, but also patient compliance. There may be barriers to prevention if patients are non-compliant with treatment, nutrition, hydration, or position change. Therefore, education at the patient level is vital and may need to be implemented as well in further projects.

Methodology

There was an extensive search using databases which include Joanna Briggs Institute (JBI), Cochrane, MEDLINE, Proquest, Cumulative Index to Nursing and Allied Literature (CINAHL), National Guideline Clearinghouse (NGC), and Ostomy Wound Management Journal archives. Various combination of key search terms were used and included extended care facilities or ECF, nursing homes, long term care, elderly, older people, geriatric, wounds, pressure ulcer, decubitus, prevention tools, protocols, risk assessment, prevent, and prevention. After the initial search was completed, abstracts and full texts were reviewed. With such a common topic for research, there were numerous articles produced with each search. The final search with each database was more conclusive by using MeSH terms. Finally, a hand search was performed from available literature with hard copies and reviewed for relevance and inclusion criteria.

Inclusion. For this literature search, inclusion criteria involved English language articles published within the last 15 years, regarding extended care residents, the elderly, and geriatric population. However, hospital settings were included since they are similar in care and environments with protocols and regulations to NHs but, the main focus was on NH care. Also, the key terms pressure ulcer, wounds, decubitus were all used in searching, as well as prevention, protocols and tools. Literature included
qualitative and quantitative studies as well as systematic reviews, meta-analysis, Joanna Briggs Institute Best Practice Sheet, and clinical guidelines.

**Exclusion.** In contrast, the exclusion criteria eliminated articles found on pressure ulcer prevention in home care or outpatient settings. Also, treatment guidelines were excluded. Non pressure ulcers were also bypassed. Finally, any literature older than 15 years was eliminated from the search.

**Summary of Evidence**

This topic has been rather extensively researched (see Table 2.1). Thus, the use of Boolean operators, truncation symbols such as the asterisks, and quotes were found helpful during the literature search. The APN started the literature search looking for systematic reviews and guidelines. JBI yielded 59 results using terms “ecf and pressure ulcer” initially. MeSH terms of “pressure ulcer and prevent*” presented with 5 relevant articles, of which two of those were synthesized for this EBP project. NGC had 39 results using the terms “pressure ulcer and prevent* and ‘nursing home’ or ecf” with six relevant. Out of those six, only one matched the criteria relating to prevention in long term care, where others were hospital based. Cochrane’s database provided four hits using search terms “risk assessment tools and prevent* ulcer”. Of those included, only one was relevant encompassing prevention and not treatment, but was a duplicate from another search. There were many guidelines in the NGC, JBI, and Cochrane that include treatment, which was an exclusion for the EBP project.

In addition, the use of MeSH terms were useful to reduce the number of results, to find relevant information in large databases. Also, the assistance of Valparaiso University’s research librarian was utilized in this process. For example, when using MEDLINE, the MeSH terms “mm Pressure ulcer/pc and ‘nursing home’ or ECF” produced 116 results. From the 116, there were 22 relevant, however multiple articles were duplicate and were already being reviewed. Therefore, only one article was
reviewed for this project. Without the use of MeSH terms, Boolean operators, and quotes, a search on MEDLINE yielded over 10,000 results. CINAHL, produced 21 articles with the search terms “MH Pressure Ulcer/PC and long term care or nursing home or extended care facility and protocol”. Six relevant articles, but one article was used meeting the full inclusion criteria, excluded articles included older than 15 years, dissertations, chronically ill children, management, and interventions not relevant to this project.

Throughout the literature search, there were duplicates within Proquest, Medline, and CINAHL. With such large numbers of articles, different search terms were used to narrow down the search. However, multiple articles did not meet the inclusion criteria. There were many articles mostly performed in the hospital which were not always relevant to the topic. The initial search with Proquest yielded over 11,000 hits. By narrowing the search using the terms “ecf or ‘nursing home’ and pressure ulcer prevention” produced 116 results. Upon using subject headings “su (pressure ulcer prevention) and nursing home” the results produced 72 hits, of which several were excluded, due to being dissertations. There were 30 hits relevant to the project with four articles. Also, the remaining articles were excluded for being treatment of pressure ulcers or from different settings, such as hospice and home care.

Finally, a hand search through specific periodicals was done with The Ostomy Wound Management Journal and Wound, Ostomy, and Continence Journal using the terms “nursing home and pressure ulcer prevent*”. There were numerous articles generated by the search, with 347 results found. Specific types of wounds and treatment was again included in the results and also different settings other than NHs. After reviewing the relevant articles, the results were decreased to 20, of which two were utilized.
Table 2.1

Summary of Search

<table>
<thead>
<tr>
<th>Search Database</th>
<th>Articles found</th>
<th>Relevant to project</th>
<th>Included in Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>JBI</td>
<td>59</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Cochrane</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>National Guideline Clearinghouse</td>
<td>39</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Proquest</td>
<td>72</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>CINAHL</td>
<td>21</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Medline</td>
<td>116</td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td>Hand search through specific wound journals</td>
<td>347</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>658</strong></td>
<td><strong>90</strong></td>
<td><strong>11</strong></td>
</tr>
</tbody>
</table>

Levels of evidence. To determine the level of evidence for each article, the guidelines from Melnyk & Fineout-Overholt (2011) was utilized. See Table 2.2 for the rating system for the hierarchy of evidence from Melnyk & Fineout-Overholt (2011) for an explanation of each level and number of articles used per level. Level I is the strongest evidence, and level VII is the weakest.
Table 2.2


<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Articles used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level I</td>
<td>Systematic review, meta-analysis of all relevant RCTs</td>
<td>4</td>
</tr>
<tr>
<td>Level II</td>
<td>Well-designed RCTs</td>
<td>0</td>
</tr>
<tr>
<td>Level III</td>
<td>Well-designed controlled trials without randomization</td>
<td>1</td>
</tr>
<tr>
<td>Level IV</td>
<td>Well-designed case-control and cohort studies</td>
<td>2</td>
</tr>
<tr>
<td>Level V</td>
<td>Systematic reviews of descriptive and qualitative studies</td>
<td>1</td>
</tr>
<tr>
<td>Level VI</td>
<td>Single descriptive or qualitative studies</td>
<td>1</td>
</tr>
<tr>
<td>Level VII</td>
<td>Opinion of authorities and/or reports of expert committees</td>
<td>2</td>
</tr>
</tbody>
</table>

Multiple articles were reviewed and critiqued to find the best available evidence. Table 2.3 summarizes the literature examined and utilized. During the literature search, there were 11 articles that fit the inclusion criteria and were graded as good or higher level of evidence.
### Table 2.3

**Summary of Evidence**

<table>
<thead>
<tr>
<th>Citation</th>
<th>Level of Evidence</th>
<th>Purpose</th>
<th>Population</th>
<th>Design/Method</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMDA, 2013</td>
<td>I</td>
<td>To improve quality care given to patients and offer a systematic approach to recognizing, assessing, treatment, and monitoring patients at risk and those with pressure ulcers.</td>
<td>ECF residents</td>
<td>Clinical guideline with external and internal peer review of published meta-analysis literature.</td>
<td>Recommendation included the use of a pressure ulcer prevention algorithm with the clinical guidelines for decreased incidence of pressure ulcers in ECFs.</td>
</tr>
<tr>
<td>Bangova, 2013</td>
<td>VII</td>
<td>Review of the effect of education and knowledge on the prevention</td>
<td>ECF residents</td>
<td>Literature review on pressure ulcer</td>
<td>Education and training are vital in</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Methodology</td>
<td>IV</td>
<td>Description</td>
<td>IV</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------</td>
<td>-----</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-----</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Buss et al., 2004</td>
<td>VI</td>
<td>To examine beliefs of nurses and doctors in ECFs on pressure ulcer prevention.</td>
<td>ECF Nurses and doctors</td>
<td>Qualitative study interviews with nurses and doctors in ECFs.</td>
<td>Implementation of knowledge, education, protocols, and team approach are important for nurses attitudes and beliefs for pressure ulcer prevention.</td>
</tr>
<tr>
<td>Catania et al., 2007</td>
<td>IV</td>
<td>Development of a pressure ulcer prevention tool and intervention protocol (PUPPI) to decrease</td>
<td>At risk patients defined as malnourished,</td>
<td>Case-Control Study involving hospital patients at risk for</td>
<td>Pressure ulcers were decreased by 50% after the</td>
</tr>
<tr>
<td>Study</td>
<td>Level</td>
<td>Study Design</td>
<td>Population</td>
<td>Methodology</td>
<td>Conclusion</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>--------------</td>
<td>-------------</td>
<td>-------------</td>
<td>------------</td>
</tr>
<tr>
<td>EPUAP &amp; NPUAP, 2009</td>
<td>I</td>
<td>Prevention recommendation to guide evidence based care to prevent development of pressure ulcers.</td>
<td>At risk patients defined as immobile, acutely ill, alteration in skin, malnourished, and elderly.</td>
<td>Meta-analysis of published literature</td>
<td>Recommendations include education, repositioning, good high protein nutrition, and good support surfaces show reduction in pressure ulcers.</td>
</tr>
<tr>
<td>Hunter et al., 2003</td>
<td>III</td>
<td>The effectiveness of skin care to prevention of skin breakdown or pressures ulcers in ECFs.</td>
<td>ECF residents</td>
<td>Quasi-experimental design study, data collected for 3 months,</td>
<td>Good skin care, protocols, education programs showed a</td>
</tr>
<tr>
<td>JBI, 2008</td>
<td>I</td>
<td>To provide health care professionals recommendation how to prevent pressure ulcers</td>
<td>At high risk patients defined as mobility impaired, elderly, acute ill, and spinal cord injuries.</td>
<td>Best practice review of four systematic reviews</td>
<td>Risk assessment tools should be done on admission and daily, repositioning, foam mattresses nutritional supplements for pressure ulcer prevention and decrease incidence.</td>
</tr>
<tr>
<td>Author/S.</td>
<td>Level</td>
<td>Study aim</td>
<td>Studies/Methods</td>
<td>Literature review</td>
<td>Findings/Conclusion</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Moore, 2001</td>
<td>VII</td>
<td>To examine issues involved in promoting more effective pressure ulcer management.</td>
<td>Studies involving nurses at different levels of education and pressure ulcer prevention.</td>
<td>Literature review of studies conducted on pressure ulcer prevention and education.</td>
<td>It is evident effective pressure ulcer prevention education and knowledge is essential to promote best practice.</td>
</tr>
<tr>
<td>Niederhauser et al., 2012</td>
<td>V</td>
<td>To examine the evidence supporting the combined use of interventions to prevent pressure ulcers.</td>
<td>Patients in Acute and long term care facilities</td>
<td>Systematic Review describing multifaceted pressure ulcer prevention.</td>
<td>Pressure ulcer prevention programs with education to nursing staff, protocols with using risk assessment tools shown successful in</td>
</tr>
<tr>
<td>Slade, 2013</td>
<td>I</td>
<td>Best evidence regarding prevention of pressure ulcers through coordinating use of pressure area care.</td>
<td>At high risk patients defined as immobile, malnourished, elderly, and acutely ill.</td>
<td>Systematic review of published literature</td>
<td>Recommendations include a risk assessment tool upon admission, protocols development and implementation, staff education allocated to annual agenda for pressure ulcer prevention and decrease incidence.</td>
</tr>
<tr>
<td>Tippet, 2009</td>
<td>IV</td>
<td>The observed effects quality improvement efforts and results of prospectively collected pressure ulcer incidence data.</td>
<td>ECF residents</td>
<td>Prospective cohort study. Data collected 2 years pre implementation team approach educational program, and protocols and 4 years post.</td>
<td>Decrease in wounds after implementation by 99% by the fourth year post implementation and decrease in cost of $124,000/year.</td>
</tr>
</tbody>
</table>
In addition to levels of evidence, each article was critiqued and assigned a grade of evidence. Grade A is the best, highest quality evidence, which means it demonstrates consistent results, sufficient sample size, adequate control, and definitive conclusions (American Nurses Association [ANA], 2014). Also, grade A has consistent recommendations based on extensive literature review that includes thoughtful reference to scientific evidence (ANA, 2014). Grade B is good quality evidence with reasonably consistent results, sufficient sample size, some control, and fairly definitive conclusions (ANA, 2014). Also, grade B has reasonably consistent recommendations based on a fairly comprehensive literature review, which includes some reference to scientific evidence (ANA, 2014). Finally, grade C is characterized by low quality or major flaws, has little evidence, inconsistent results, insufficient sample size, and conclusions that cannot be drawn (ANA, 2014).

Using the John Hopkins Nursing Evidence Based Practice (JHNEBP) research and non-research appraisal tool, multiple articles were reviewed and appraised. This tool was developed by nurses and faculty at The Johns Hopkins Hospital and The Johns Hopkins University School of Nursing, for evidence-based practice and includes a scale for evaluating the level of evidence and criteria for evaluating the quality of evidence (ANA, 2014). This tool was chosen due to the ability of the tool to evaluate the quality of the evidence and use with all levels of evidence. This tool was used for all level II-VII evidence.

Evidence Appraisal

**Level I evidence.** Two clinical guidelines were reviewed and appraised using the AGREE II tool, which is used for appraisal of guidelines for research & evaluation. This is a tool designed for clinical guidelines and consist of 23 questions, which cover six domains. It is a thorough evaluation of guidelines that help the reader have a better
understanding of reliability and validity. According to the Agree Research Trust (2013), the purpose of the AGREE II, is to provide a framework to assess the quality of guidelines, provide a methodological strategy for the development of guidelines, and determine how information ought to be reported in those guidelines.

Furthermore, using the Agree II tool, the American Medical Directors Association (AMDA) guidelines yielded an 86% reliability and validity as a Level I evidence, grade A quality (2013). It was great in development, clarity, and presentation. Editorial independence was maintained. However, it failed to state any potential organizational barriers when applying the guidelines or any possible costs for the facilities were not mentioned. AMDA's approach was to offer providers a systematic, four phase, algorithm to recognizing, assessing, treating, and monitoring patients with pressures ulcers in NHs with detailed steps in each phase.

Additionally, the European Pressure Ulcer Advisory Panel (EPUAP) and the National Pressure Ulcer Advisory Panel (NPUAP) came up with a clinical practice guideline for pressure ulcer prevention (2009). Reviewed for this project was the quick reference guide of these guidelines. Using the AGREE II tool, it scored an 85.6% reliability and validity as level I, grade A evidence. The reference is very detailed in the explanation of each component to pressure ulcer prevention. It excelled in the areas of development, clarity, and presentation, with editorial independence maintained. The guide is thorough with each level of assessment with risk, skin, nutrition, repositioning, and support surfaces represented. It describes several levels of the strength of the evidence with A as the strongest, B as good evidence, and C as the lowest strength. A common theme noted in many of the different areas is education among health care professionals being a level B: good evidence (EPUAP & NPUAP, 2009). Inspecting often, not using massage as a prevention, and using skin emollients to hydrate dry skin to reduce risk of skin damage, were also at a level B, good evidence (EPUAP & NPUAP,
There is strong evidence (level A) for high protein and oral nutritional supplements in addition to the usual diet, for those at risk for nutritional deficiencies and skin damage, showing a significant reduction in pressures ulcers (EPUAP & NPUAP, 2009).

Another strong level of evidence (level A) is repositioning often to reduce the duration of pressure over vulnerable bony prominences in a bed as well as a chair to reduce pressure ulcer prevalence (EPUAP & NPUAP, 2009). For support surfaces, there shows a reduction in pressure ulcers with strong, level A evidence by using a higher specification foam mattress, rather than standard mattress, for all individuals at risk (EPUAP & NPUAP, 2009). Also, the same recommendations is for alternating pressure active support mattresses (EPUAP & NPUAP, 2009). Finally, placing a pillow under the calves to elevate heels, providing pressure redistributing seat cushions while in a chair, and using natural sheep skin pads are a good level B evidence in pressure ulcer prevention (EPUAP & NPUAP, 2009).

The Joanna Briggs Institute (JBI) best practice review sheet, is level I, grade B evidence. The JHNEBP tool was utilized. The research question was clearly stated and search strategies were listed with details of the types of studies used. Exclusion and inclusions were discussed as well as limitations. JBI performed four systematic reviews on pressure ulcer prevention. The goal for this review was to offer health care professional’s recommendation on methods for preventing pressure ulcers. Recommendations made included risk assessment tools performed on admission and daily thereafter, repositioning, foam mattresses, use of the Braden Scale, and nutritional supplements for pressure ulcer prevention.

Another systematic review done by Slade (2013) looked at the best evidence regarding prevention of pressure ulcers through coordinating use of pressure area care. This is a level I, high grade A evidence using the JHNEBP tool. The research question
was easily identified and search strategies were clearly stated with details of the types of studies used including randomized control trials. Exclusions and inclusions were not stated, but limitations were disclosed. Slade (2013) looked at high risk patients defined as immobile, malnourished, elderly, and acutely ill. Recommendations included using risk assessment tools upon admission performing, daily skin assessments, developing and implementing protocols, and educating staff for pressure ulcer prevention all show consistent results with pressure ulcer prevention. Daily personal care with application of a skin barrier, rehabilitation if a mobility issue is present, and use of Braden Scale were also recommended.

**Level III evidence.** Furthermore, Hunter, Anderson, Hanson, Thompson, Langemo, & Klug performed a quasi-experimental, pre and post-test study design (2003). The goal of the study was to show the effectiveness of skin care to prevention of skin breakdown or pressures ulcers in NHs. The participants included 136 adult nursing home residents within two nursing home facilities. Baseline data was collected weekly for three months regarding skin condition using assessment, Braden scores and current facility usual care and protocols. After the three month data collection was completed, the project managers provided a week long educational program encompassing definitions, assessments, and documentations of types of skin conditions and breakdown. Incorporated into these educational sessions was the experimental intervention with the prophylactic use of the study’s skin care barrier products. Following the week long educational sessions, the three month clinical trial commenced with current skin care protocol with the addition of skin protectant and body wash. Results showed that good skin care, protocols, and education programs illustrated a decrease in skin breakdown from 31.6% to 21.3% with a statistically significant reduction in Stage I and II ulcers from 19.9% to 8.1%. This was a Level III, grade B, good study. There was
a good sample size without randomization and clearly stated data collection and method. Hunter et al. discussed results and analysis in detail and identified limitations as well.

**Level VI evidence.** A study conducted by Tippet (2009) looked at the observed effects of quality improvement efforts and results of prospectively collected pressure ulcer incidence data. The author performed a prospective cohort study, with data collection two years pre-implementation, a team approach, an educational program, and protocols. Data was again collected at four years post intervention. The study was conducted at a 151 bed NH with an average monthly census of 137. Person-months in the pre-initiative period totaled 3,234 with post-initiative total 6,446 (Tippet, 2009). There was a decrease in wounds after implementation by 99% and decrease in cost of $124,000/year. These results confirmed that pressure ulcers can be significantly reduced in NHs when well established guidelines are followed and protocols with education are implemented. This was a Level IV, grade B good study. There was a good sample size without randomization and clearly stated data collection and method. Tippet also discussed results and analysis in detail and identified limitations as well.

Catania, Huang, James, Madison, Moran, & Ohr (2007) conducted a case-control study involving hospital patients at risk for pressure ulcers and health care providers involved in their care. The authors developed a pressure ulcer prevention tool and intervention protocol to decrease prevalence of pressure ulcers and to be adapted into practice at facilities. A pressure ulcer prevention tool was developed encompassing the Braden Scale’s six risk areas comprised of sensory perceptions, moisture, activity, mobility, nutrition, and friction/shear. Albumin levels for nutrition and skin barrier creams were also included. The study was done on a five inpatient unit facility. The nursing staff was given packets of in depth educational material for pressure ulcer prevention with an educational session provided. In the first quarter, more than 700 patients were evaluated with 30% determined to be at risk for pressure ulcers. From those, a sample
size of 146 showed a drop in the rate of pressures ulcers from 11.1% to 4.11%. The results showed pressure ulcers were decreased by 50% after the protocol and interventions were utilized. These results have been maintained well under the national average for more than two years since the article was written (Catania et al., 2007). For hospital acquired ulcers since implementation of the project, the rate of pressure ulcers has remained under 2.94% with 2.12% being the average rate.

To conclude, this was a level IV, grade A high quality study. There was a strong sample size without randomization and clearly stated data collection and method. Literature search and background were evident to the research topic. The development of the intervention of the pressure ulcer prevention tool was discussed in great detail. Results were displayed and shown for 1 ½ years post implementation. Catania et al. also discussed results and analysis in detail and identified limitations as well.

**Level V evidence.** Another systematic review without randomization was a study conducted by Niederhause, Van Deusen Lukas, Parker, Ayello, Zulkowski, & Berlowitz (2012). This study is a level V, high grade A evidence. The research purpose was to examine the evidence supporting the combined use of interventions to prevent pressure ulcers. The population reviewed included patients in acute and long term care facilities and nursing staff. The authors performed a systematic review describing multifaceted pressure ulcer prevention. There were several areas reviewed which included pressure ulcer prevention best practice with assessment tools and protocols, staff education, clinical monitoring and feedback, and skin care champions. The results showed that pressure ulcer prevention programs, with education of nursing staff, and protocols using risk assessment tools were successful in pressure ulcer prevention. The research question was easily identified and search strategies were clearly stated with details of the types of studies. Exclusions and inclusions were stated, and limitations were disclosed. Design method and data analysis were described in detail and easy to follow.
**Level VI evidence.** A study conducted by Buss, Halfens, Abu-Saad, & Kok (2004) looked at a qualitative approach to pressure ulcer prevention in nursing homes in the Netherlands. As a level VI, good grade B evidence, the authors examined the beliefs of nurses and doctors in NHs on pressure ulcer prevention. The study population was NH nurses and doctors in five different Dutch NHs. The sample size of 18 was comprised of 14 nurses and four doctors. After those 18 interviews were completed, interviewing was stopped because of data saturation (Buss et al., 2004). Data discussed in the interviews included pressure ulcer prevention information from available protocols from facilities and EBP. It was found that protocols were outdated and staff was following old information for prevention and were not as familiar with the current, up-to-date recommendations for pressure ulcer prevention. Poor attitudes toward pressure ulcer prevention and lack of involvement was shown to hinder diffusion and integration of knowledge into practice (Buss et al., 2004).

Finally, results showed that implementation of knowledge, educational programs, protocols, and positive team approach was important for prevention in pressure ulcers. There was a small sample size, but for qualitative research, this was a good size to obtain saturation. The authors clearly stated data collection, method, and analysis. Literature search and background were evident to the research topic. The research questions were evident.

**Level VII evidence.** Bangova (2013) reviewed the effect of education and knowledge on the prevention of pressure ulcers and heel ulcers in NH patients. This is a level VII, grade B article. The author is from the health care field and used scientific evidence to formulate her conclusions. Bangova performed a comprehensive literature review on pressure ulcer, including heel ulcer, prevention in NH patients. It was found that throughout several articles, education and training were basic requirements. Also, having visual educational flyers helped to raise awareness for pressure ulcer prevention.
It can be concluded from this literature review that education and training are vital in preventing heel pressure ulcers in nursing home residents.

Another literature review done by Moore (2001) examined issues involved in promoting more effective pressure ulcer management. The author looked at studies involving EBP, education content, educational level, ritualistic practice, and attitude. Important findings were evident throughout the literature reinforcing the importance of education. Knowledge assists nurses in making appropriate clinical decisions and developing preventive strategies to target risk areas (Moore, 2001). Formal education was essential in promoting EBP. Advanced practice nurses made more accurate decisions for patient care and prevention. Strong knowledge basis was essential to deliver safer care, proving education is important to pressure ulcer prevention (Moore, 2001). Effective pressure ulcer prevention requires nurses to have an in-depth understanding of the process that predisposes patients to pressure ulcer development (Moore, 2001). The author found that encouragement, support, and positive attitude were important factors along with research and the availability of nurses to access research.

Overall, this is a level VII, grade B article. The author is an expert in the field of wound prevention and is highly educated. Moore used scientific evidence and relevant literature to formulate her conclusion, but did not state her method of research. The opinion of the author was stated within the conclusion as well as findings from the literature.

**Construct Evidence Based Practice**

**Synthesis of literature.** During the review of literature, a consensus was demonstrated that pressure ulcers are preventable with adequate hydration, nutrition, support surfaces, risk assessment, and skin care (American Medical Directors Association [AMDA] 2013; Bangova, 2013; Catania, Huang, James, Madison, Moran, &
Ohr, 2007; European Pressure Ulcer Advisory Panel [EPUAP] & National Pressure Ulcer Advisory Panel [NPUAP], 2009; Moore & Cowman, 2014; NPUAP, 2007). Identifying those at risk is an important first step with prevention of pressure ulcers (EPUAP & NPUAP, 2009; Joanna Briggs Institute [JBI], 2008; Slade, 2013). Involvement of the physician with the multidisciplinary NH team is essential for prevention and treatment (Buss, Halfens, Abu-Saad, & Kok, 2004; Moore, 2001; Tippet, 2009).

By implementing a new or revised pressure ulcer protocol, there will be involvement and enhanced education with physicians and nurses. Educational programs could be used to inform nurses about evidence-based knowledge, the benefits of protocols, and to motivate them to use the available protocols (Bangova, 2013; Buss et al., 2004; EPUAP & NPUAP, 2009; Hunter, Anderson, Hanson, Thompson, Langemo, & Klug, 2003; Slade, 2013; Tippet, 2009). Implementing protocols and prevention tools while educating the nurses, is a proven benefit and shows direct results of lowering the prevalence of pressure ulcers (Bangova, 2013; Catania et al., 2007; Hunter et al., 2003; Slade, 2013; Tippet, 2009).

As indicated by multiple articles reviewed, pressure ulcers are largely preventable, and education and training are essential to reduce the incidence of pressure ulcers in the hospital and NH settings (Bangova, 2013; Buss et al., 2004; Hunter et al., 2003; Tippet, 2009). Implementation of protocols and tools for prevention of pressure ulcers is necessary and important within ECFs (Bangova, 2013; Buss et al., 2004; Catania et al., 2007; Hunter et al., 2003; Tippet, 2009).

Additionally, the rising cost of health care is affected by the increasing cost for wound care and inadequate reimbursement, especially in the NH setting. According to O’Connor (2012) with *McKnight’s Long Term Health Care News and Assisted Living*, the global wound care market will surpass $20 billion in the next two years, and treatment costs will increase with the severity of ulceration and associated complications.
In 2005, the average cost for healing a Stage IV ulcer was $37,000 (Derby-Bemis, 2008). Expenses to treat pressure ulcers include nursing staff, practitioners, supplies, longer stays, and antibiotics and/or surgical procedures, all of which increase the health care costs. Approximately 90% of daily care costs are associated with nurses’ and nursing assistants’ time (Bangova, 2013). Prevention will also decrease risk for infection or surgical interventions, which are also costly. According to JBI (2008), pressure ulcers, are in many cases, preventable, and a targeted preventive approach will be less costly than one that is focused on treating already established ulcers.

With such a high prevalence of wounds in NHs (one in 10 NH residents had a pressure ulcer within the United States), there needs to be a change with education and training to reduce the incidence of pressure ulcers and to prevent them (Bangova, 2013; NCHS, 2009). Also, prevalence in the past two decades has nearly doubled nationally, increasing overall from 9.2% in 1989 to 15.5% in 2003-2004, and nosocomial prevalence has increased from 5.6% to 10% (Tippet, 2009). Treating wounds is 2.5 times more costly than preventing them (Catania et al., 2007; JBI, 2008; Vap & Dunaye, 2000).

Implementation of a protocol for skin care, along with a prevention tool with staff education, reduces the incidence of skin breakdown, including pressure ulcers (Bangova, 2013; Buss et al., 2004; Catania et al., 2007; EPUAP & NPUAP, 2009; Hunter et al., 2003; Slade, 2013; Tippet, 2009).

In summary, based on the best evidence in the literature, there is a need for pressure ulcer prevention within healthcare, especially in the NH. There is proven cost effectiveness with prevention over treatment of pressure ulcers. Importantly, involvement of staff with educational training is crucial to better outcomes. However, a perceived barrier may be staff compliance and/or patient compliance. Those barriers may hinder prevention of pressure ulcers if non-compliant with treatment, nutrition,
hydration, or position changes. The evidence clearly states that with education, protocols, and risk assessment tools, there is a decrease in prevalence in pressure ulcers (Bangova, 2013; Buss et al., 2004; Catania et al., 2007; Hunter et al., 2003; Tippet, 2009). Also, the prevalence of pressure ulcers in the past two decades has nearly doubled, and proves the need for implementation of an intervention for a decrease in incidence.

To conclude, there is room for change in the NH setting, and even small improvements make a difference. The incidence of pressure ulcers can be significantly reduced and reductions sustained by changing the culture of an organization and adopting evidence-based prevention strategies (Tippet, 2009). Education will be essential to a change within any NH. Providing better care, with prevention of pressure ulcers at the center with protocols, education, and assessment tools (such as the PUPPI tool), will improve quality of care, patient safety, and cost. All factors improve nursing care and decrease deficiencies with health inspections. Pressure ulcer prevention is a multifaceted topic with continuing education and change needed within NHs for better quality of care overall.
CHAPTER 3

Implementation of Practice Change

The primary outcome and overall goal for this EBP project was to decrease the incidence of pressure ulcers within the nursing home and increase staff awareness of prevention education. The intervention was to educate the nursing staff on pressure ulcer prevention and the PUPPI tool. This was accomplished with an educational presentation with a group and one-on-one sessions, implementation of the PUPPI tool, and handouts regarding both the PUPPI tool and pressure ulcer prevention.

Setting

The setting for this EBP project was a nursing home (NH), established in 1985, in the Duneland Community, which is located in Northwest Indiana. This 100 certified bed facility averages 95 residents and participates in Medicare and Medicaid. The Director of Nursing and staff were receptive to the project and proposed interventions, and in the planning phase were willing to adapt to their usual routine, but due to management changes, no decision has been made at this time.

Intervention and Planning

For this EBP project, the intervention was to educate the nursing staff on pressure ulcer prevention using the PUPPI tool. This was done prior to implementation of the tool and again midway through project. The APN provided a 15-20 minute educational session to discuss the use of the tool, purpose, and goals of the project. Six smaller one-on-one sessions were also conducted for those who were unavailable to attend the larger group session. These educational presentation included statistics about pressure ulcers in the nursing home, staging of pressures ulcers, risks and benefits of pressure ulcer prevention, review of prevention strategies, and detailed explanation of the PUPPI tool. In addition to the initial education session, the APN
provided multiple one-on-one educational in-services to the nurses involved in the program throughout the 12 weeks. PowerPoint slides (see appendix B) were handed out to the staff regarding what was discussed in the education session with pressure ulcer prevention and the PUPPI tool. Time was allowed for questions and concerns to be addressed at the end of the presentations. Flyers were posted in the break room, medication room, and the nurse’s station to serve as reminders about the PUPPI tool, benefits of pressure ulcer prevention, and key elements to pressure ulcer prevention.

Furthermore, the tool was completed three days a week on Monday, Wednesday, and Friday, on patients at high risk for pressure ulcers with a Braden score of 14 or below and weekly on Mondays for those at low risk with a Braden score of 18-15 (Indiana State Department of Health [ISDH], 2014). The PUPPI tool was implemented during a 12 week time period. The PUPPI tool that was used was derived from a preexisting tool developed for another research project regarding pressure ulcer prevention (Catania et al., 2007). The APN contacted the creator and researcher and has received permission to use the tool and make any changes as needed. Since it was initially used in a hospital setting therefore, some adjustments were made to better fit with the NH atmosphere (see Appendix C).

Moreover, this PUPPI tool consist of several areas, sensory perception, moisture, activity, mobility, nutrition, and friction and shear. In revising the tool, current protocols were reviewed for continued development of the modified PUPPI tool. The modified PUPPI tool utilized for this project incorporated the current practice of using the Braden scale and identifying moderate and high risk patients. A patient not at risk has a Braden’s score of 19 and above, Low risk is a score of 18-15, Moderate risk is a score of 14-12, High risk is a score of 12 and below (ISDH, 2014). Once a patient was determined to be at moderate or high risk for a pressure ulcer with a Braden score of 14 or below, the PUPPI tool was applied to the daily routine for that patient on Monday’s,
Wednesday’s, and Friday’s. For patients with Braden scores of 15-18, the PUPPI tool was utilized weekly.

**Sample**

For this project, the participants were the nurses employed at the facility. Both Registered and Licensed Practical Nurses participated. The sample size was 11 nurses of various ages and gender with different years of experience. Informed consents were obtained from the nursing staff participating in the utilization of the tool and the educational session. Nurses were assured that no penalties would be incurred from declining to participate. Participants were encouraged to ask questions prior to signing the consent, and the APN was on site and available to address any questions or concerns. The subjects were given the APN’s contact information if any further questions or concerns arose.

**Outcomes**

The primary outcome and overall goal for this EBP project was to decrease the amount of acquired pressure ulcers within the nursing home by increasing staff awareness through prevention education. By utilizing the PUPPI tool with proven statistics for decreasing pressure ulcers, the project manager anticipated a positive statistical outcome for this project. A secondary goal for this project was the future and long term use of this tool in the facility, pending positive data showing a decrease in pressure ulcer rate.

**Data Collection and Management**

Upon completion of the project, an anonymous satisfaction survey was distributed to each participant. This survey evaluated the ease and effectiveness of the PUPPI tool. The APN analyzed the demographic data from the surveys. In addition, pressure ulcer rates were also collected from the charts as retrospective data from 2013, September thru December. Pressure ulcers can vary with moisture, humidity, and high
temperatures. Therefore, the APN collected the pressure ulcer rates from the same months, the year prior, for more comparable data. The rates may be higher during the summer months due to these conditions, which may alter the data. At the end of the 12 week intervention and two months post intervention, data was obtained regarding pressure ulcer incidence. This data was analyzed and reviewed along with Braden scales and albumin levels, from those resident’s from the monthly census list. New resident’s admitted to the facility had an initial Braden’s score performed with initialization of the PUPPI tool if they met criteria for project.

Also, the APN was in the facility one to two times a week during the 12 week period. Questions or concerns were addressed at this time for the nurses. Weekly reminders of pressure ulcer prevention and PUPPI tool utilization to the participants was carried out. Wound data sheets were reviewed weekly in addition to the completed PUPPI tools.

During the project, data was kept in a locked file box and secured on a password protected computer. Medical charts protected by HIPPA laws were stored in an electronic medical record system which employees only had access to via password protection. All secure information was kept confidential.

Data Analysis

Finally, analysis of data was done using SPSS and Microsoft Excel. The analysis include ratio level data from incidences of pressure ulcers from residents’ charts, descriptive statistics looking at frequency, means, and standard deviations. Also, demographic information from the subjects including nominal data with genders, ordinal level data with education level and years of practice, and age as ratio level data was analyzed. Also, satisfaction survey answers regarding the education session used a Likert scale for nominal data. The relationship of Braden scores and albumin levels was compared with using a Pearson r correlation.
Risk and Confidentiality

To conclude, there was no physical or other known risks to participating in the project. There were no invasive techniques used. This project was designed to increase nursing knowledge about pressure ulcer prevention, and involved collection of data from charts and participants. This was done before and after an educational intervention to be able to compare data. Confidentiality was maintained throughout the project to ensure protection to the subjects which minimized potential risks. Approval from the Institutional Review Board at Valparaiso University was obtained prior to the initiation of the project.

Finally, anonymity in the reporting of any data was maintained. Subjects or patients names were not used in data collection. Participants in the project were involved in an educational session and were expected to increase their knowledge about pressure ulcer prevention. Secondary outcomes might be a sense of greater competency, job satisfaction, and personal enrichment, and in turn promote better quality care and outcomes to the NH patient for whom they care but for the purposes of this project were not analyzed. Consents were obtained at the beginning of the project, prior to implementation. Questions and concerns were addressed throughout the project. The APN was available throughout the 12 weeks via phone, email, or in person with weekly visits.
CHAPTER 4

Findings

The purpose of this EBP project was to determine if implementation of a PUPPI tool along with staff education decreased the incidence of pressure ulcers within the nursing home (NH). The PICOT question addressed is: *In older adults living in a nursing home, what is the effect of a pressure ulcer prevention tool and staff education, compared to usual care, on the incidence of pressure ulcers over a three month period?*

To assess the effectiveness of education and the utilization of the PUPPI tool, wound incidence was obtained from four months retrospective data, three months during the intervention, and two months post-intervention. Demographic data was obtained and reviewed from the nurse participants. Finally, analysis of the PUPPI tool and educational sessions was performed through a post-intervention survey.

Sample Characteristics

The nurses working at the NH provided the sample to whom education was provided in order to measure the effectiveness of the intervention on pressure ulcer incidence. At the beginning of the EBP project, the starting sample size was 12 nurses, with only eight completing the survey after the project. The ages of the nurses ranged from 44-60 years old with the mean age being 50.75 ($SD=5.339$). Female nurses made up 62.5% ($n=5$) of the sample, with 37.5% ($n=3$) being male. LPNs comprised 62.5% ($n=5$) of the sample with 37.5% ($n=3$) RNs. Years of experience among the nurses varied, with 37.5% ($n=3$) practicing 8-11 years, 12-15 years and 16-19 years both at 6.3% ($n=1$), 20-23 years of experience at 25% ($n=2$), and greater than 24 years at 6.3% ($n=1$).
Outcomes

Pre-intervention pressure ulcer incidence. Data on pressure ulcer stages were collected from September thru December 2013, with descriptive statistics examined for frequencies and means (Figure 4.1). For the month of September, there were 11 pressure ulcers, with 45.4% of the wounds being Stage II. Stage III, IV, and Unstageable were 18.1% each. One pressure ulcer was facility-acquired (which was healed). Also, there were seven total patients with those 11 wounds, indicating several residents having multiple wounds. In October, eight wounds on four patients were recorded, with all wounds being present upon admission to the NH consisting of: Stage I 12.5% (n=1), Stage II 50% (n=4), Stage III 25% (n=2), Stage IV 12.5% (n=1), and Unstageable 0% (n=0). Only one wound was healed out during that month. During November, there were seven patients with a total of eight wounds, with one being facility acquired. Three pressure ulcers comprised 37.5% of the total and were healed by the end of the month. For November, the pressure ulcers consisted of: Stage I 12.5% (n=1), Stage II 50% (n=4), Stage III 25% (n=2), Stage IV 12.5% (n=1) and Unstageable 0% (n=0). Finally, in December 2013, there were six patients with 13 total wounds, all being present upon admission, with 61.5% (n=8) healed by months end. Of those 13 pressure ulcers noted in December, there were: Stage I 23% (n=3), Stage II 30.7% (n=4), Stage III 8% (n=1), Stage IV 8% (n=1), and Unstageable 30.7% (n=4).
During the intervention pressure ulcer rates. Pressure ulcer incidence was collected during the project from September thru November (Figure 4.2). For the month of September, there were 20 pressure ulcers, with Stage II comprising 50% of those wounds (n=10). The remainder were Stage I at 5% (n=1), Stage III, and Stage IV both at 10% (n=2), with Unstageable at 25% (n=5). Findings also showed that five wounds decreased in size and another five wounds healed for September. The total number of patients with wounds was ten, with 50% acquired (n=5) and 50% present upon admission (n=5) for the same month. During October, there were 14 total wounds; however, several wounds changed from Stage II to Unstageable. There were 12 patients total with pressures ulcers, with 50% acquired (n=6) and 50% present upon admission (n=6) for the same month. Stage I, III, IV each were at 7% (n=1) with Stage II at 64% (n=9) and Unstageable at 35.7% (n=5) for October. Additionally, seven wounds were healed during the month. Finally, for November, there was a total of 21 pressures ulcers among 12 patients, with 42% acquired (n=5) and 58% present upon admission (n=7).
Unstageable pressure ulcers were most prevalent at 47.6% (n=10) with Stage I, III, and IV each at 4% (n=1), and Stage II at 38% (n=8) for November. This month showed three pressure ulcers heal, and one Stage II change to Unstageable. Overall, during the intervention, the more severe Stage III and Stage IV pressure ulcers were decreased.

Figure 4.2 Pressure ulcer data during the intervention

Post-intervention pressure ulcer rates. Finally, pressure ulcer data was collected two months post-intervention during December 2014 and January 2015 (Figure 4.3). For December, there were a total of 14 patients with 22 wounds, comprised of 32% (n=7) acquired and 68% (n=15) present upon admission to the NH. There were 0% Stage I and Stage IV pressure ulcers; however, there were 45.4% Stage II (n=10), 9% Stage III (n=2) and 45.4% Unstageable (n=10) for December. In total, seven wounds healed for the month. Finally, January had a total of 22 pressure ulcers with 9% facility acquired (n=2) and 90% present upon admission (n=20) with a total of 10 patients. Stage II pressures ulcers at 63.6% (n=14) were the most prevalent. With Stage I at 4% (n=1), Stage III at 13.6% (n=3), Unstageable at 18.1% (n=4), and Stage IV at 0% for that month. For January, four wounds were healed.
**Comparison of total number of pressure ulcers.** When comparing the rate of pressure ulcers from 2013, 2014, and two months post-intervention (see Figure 4.4) the project manager looked at the frequencies of both months and each wound Stage using descriptive statistics with totals, means, and standard deviations with paired sample t-tests. The total incidence of pressure ulcers from 2013 showed an increase in 2014. However, two months post-intervention, total pressure ulcers rates \((n=40)\) decreased from 2014 \((n=58)\), showing a positive outcome with a decrease in rates of wounds. A paired-sample t-test was used to compare the mean pressure ulcer rate from 2013, 2014, and two months post project. The mean pressure ulcer rate for 2014 was 11.6 \((SD=11.15)\); the mean pressure ulcer rate for two months post-intervention was 8.8 \((SD=10.13)\). No significant difference from 2014 to two months post-intervention was found \((t(8)=0.415, p>0.05)\). The mean pressure ulcer rate for 2013 was 8 \((SD=5.09)\), while the mean pressure ulcer rate for two months post-intervention was 11.6 \((SD=11.15)\). No significant difference from 2013 to 2014 was found \((t(8)=-0.656, p>0.05)\).
The project manager then compared each stage of pressure ulcers. There was a decrease in Stage I pressure ulcers overall from 2013 ($n=5$, $SD=1.25$) to 2014 ($n=3$, $SD=0$) and two months post-intervention ($n=1$, $SD=0.70$). However, there was no significant difference from 2013 to two months post-intervention ($t(4)=0.755$, $p>0.05$). In comparing Stage II pressure ulcers from 2013 ($SD=0.5$), there was an increase in 2014 ($SD=4.26$) with a decrease two months post-intervention ($SD=2.8$). A paired sample $t$-test showed a difference between 2013 to 2014 ($t(5)=-8.385$, $p<0.05$) with an increase in pressure ulcers, but no significant difference from 2014 to two months post-intervention ($t(3)=-1.8$, $p>0.05$).

Total Stage III pressure ulcers from 2013 ($SD=0.5$) to 2014 ($SD=0.57$) did not show any significant changes to two months post-intervention ($SD=0.70$) ($t(5)=-1.549$, $p>0.05$). There was a significant decrease in Stage IV pressure ulcers two months post-intervention ($SD=0$) compared to 2013 ($SD=0.5$) and 2014 ($SD=0.57$) ($t(4)=3.333$, $p<0.05$). Finally, there was an increase in Unstageable pressure ulcers in 2013 ($SD=1.91$) to 2014 ($SD=2.88$) and two months post-intervention ($SD=4.24$); however, this change was not statistically significant ($t(4)=-2.358$, $p>0.05$).

*Figure 4.4 Total pressure ulcer data*
The project manager also looked at the comparison of total of number of patients with pressure ulcers for each stage using a paired sampled t-test (Figure 4.5). During this EBP project, there were 78% female patients ($n=47$) and 22% male patients ($n=13$) with age range of 45-100 years old ($M=77.9$). The total number of patients with pressure ulcers increased from 2013 ($n=30$, $SD=1.15$) to 2014 ($n=42$, $SD=2.17$) with a decrease two months post-intervention ($n=30$, $SD=2.82$), but there was not a statistically significant difference ($t(8)=0.604$, $p>0.05$).

*Figure 4.5 Number of patients with pressure ulcers*

**Types of pressure ulcers.** Comparison was done looking at facility acquired, and upon admission pressure ulcers using a paired sample t-test (Figure 4.6). Facility acquired pressure ulcers are wounds that begin at the nursing home. Many patients present to the nursing home from hospitals, home, or other facilities with pressure ulcers present upon admission. There was an increase in facility acquired pressure ulcers from 2013 ($n=2$) to 2014 ($n=18$), with a significant decrease of 50% ($n=9$) two months post-intervention ($t(3)=2.306$, $p<0.05$). (See Figure 4.6). Pressure ulcers present upon admission showed a persistent decreasing trend overall with 2013 ($n=38$), to 2014 ($n=37$) and two months post-intervention ($n=35$). From 2014 ($n=58$) to two months post-
intervention \((n=44)\) the total amount of pressure ulcers, facility acquired and present upon admission, decreased, but the change was not statistically significant \((t(4)=.415, p>0.05)\).

*Figure 4.6* Comparison of different types of pressure ulcers

**Patients with different types of pressure ulcers.** Comparison was done observing the number of patients with facility acquired pressure ulcers and patients with pressure ulcers present upon admission using a paired sample \(t\)-test. The total number of patients with facility acquired pressure ulcers in 2014 decreased by over 50% two months post-intervention showing a statistical significance post-intervention \((t(3)=3.220, p<0.05)\). (See *Figure 4.7*). There was a steady decrease, but with no significant change with the total number of patients with pressure ulcers present upon admission from 2013, 2014, and two months post-intervention \((M=19, SD=2.64)\). The total number of patients with all types of pressure ulcers increased from 2013 \((n=24, SD=1)\) to 2014 \((n=34, SD=1)\), with a decrease two months post-intervention \((n=24, SD=2.12)\), but the change was not statistically significant \((t(3)=-1.806, p>0.05)\).
Secondary Outcomes

The project manager also looked at Braden scores pre and post intervention as well as albumin scores pre and post intervention. Pre-intervention Braden scores ($M=15.4$, $SD=2.65$) compared to post-intervention Braden scores ($M=15.7$, $SD=2.75$) presented with no significant change. Comparison of pre-intervention albumin levels ($M=2.9$, $SD=0.50$) with post-intervention albumin levels ($M=2.9$, $SD=0.48$) indicated no significant change. A Pearson correlation was calculated examining the relationship between pre-intervention Braden scores and pre-intervention albumin levels ($r(39)=.296$, $p>.05$) showing a weak correlation with no significance. Post-intervention Braden scores and post-intervention albumin levels were compared using a Pearson correlation ($r(39)=.282$, $p>.05$) displaying a weak correlation with no significance (see Table 4.1).
Table 4.1

Correlations Between Braden Scores and Albumin Levels

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<th></th>
<th>Braden’s Scores Pre-Intervention</th>
<th>Braden’s Scores Post-Intervention</th>
<th>Albumin levels Pre-Intervention</th>
<th>Albumin levels Post-Intervention</th>
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<td>.060</td>
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*. Correlation is significant at the 0.05 level (2-tailed).

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

PUPPI Tool Evaluation

The project manager also surveyed the nursing staff to evaluate the educational program and satisfaction with the PUPPI tool. Overall, the acceptance of the PUPPI tool was favorable. All participants felt the education session and the PUPPI tool were beneficial to pressure ulcer prevention. There was a consensus on the ease of the PUPPI tool and good confidence in using the tool. When using the tool, 25% \( (n=2) \) found it time consuming and 62.5% \( (n=5) \) would recommend adding the tool to usual care for pressure ulcer prevention while 25% \( (n=2) \) would consider adding to daily routine and 12% \( (n=1) \) would not recommend it.
CHAPTER 5

Discussion

The primary outcome and overall goal for this EBP project was to decrease pressure ulcers within the nursing home (NH) and increase staff awareness of prevention education. The intervention was to educate the nursing staff on pressure ulcer prevention and the PUPPI tool. This was accomplished with an educational presentation given to both a group and in one-on-one sessions, implementation of the PUPPI tool, and handouts regarding both the PUPPI tool and pressure ulcer prevention. Data were analyzed and showed that by following protocols, providing education, and using assessment tools, nurses could help decrease the incidence of acquired pressure ulcers in the NH. There were several factors that contributed to the results of this project, and they will be discussed in this chapter.

Explanation of the Findings

For this EBP project, the intervention was to educate the nursing staff on pressure ulcer prevention using the PUPPI tool for a three-month period. To assess the effectiveness of the education and the utilization of the PUPPI tool, records of pressure ulcer incidence was obtained from four months retrospective data, three months during the intervention and two months post intervention. Demographic data was obtained and reviewed from the nurses. Finally, analysis of the PUPPI tool and educational sessions was performed through a post-intervention survey. The PICOT question addressed for this EBP project is: In older adults living in a nursing home, what is the effect of a pressure ulcer prevention tool and staff education, compared to usual care, on the incidence of pressure ulcers over a three-month period? This EBP project showed good results with overall acceptance, ease, and benefits of using the PUPPI tool from the nurses, a decrease in total amount of pressure ulcers, a significant decrease in Stage IV
pressure ulcers, and a significant decrease of over 50% in total number of patients with facility acquired pressure ulcers.

Many barriers to implementation of the project were identified. The total number of nurses at this facility is around 15, but only 11 nurses agreed to participate. Due to two nurses dropping to part-time and one nurse leaving the facility, the final sample size that completed the survey post intervention was eight. The majority of the nurses were female and LPNs. The majority of the nurses agreed that the PUPPI tool was what they were already doing for patients, but the tool presented this in a more organized manner. This tool helped to speed up the process and organize the pressure ulcer prevention with daily care. The nurses stated that the PUPPI tool brought the dietitian and utilization of multivitamins, zinc, and nutritional drinks earlier into the plan of care for patients at high risk for pressure ulcers. Also, the use of skin protectant creams were initiated much sooner. Overall, the acceptance of the PUPPI tool was favorable and the majority recommend it for use in practice.

Of the patients with pressure ulcers who had a Braden Score of less than 18, 78% were female patients and 22% were male patients. Two months post-intervention the total number of patients with facility acquired pressure ulcers decreased by over 50% showing statistical significance ($t(3)=3.220, p<0.05$). Two months post-intervention, facility acquired pressure ulcers, showed a statistically significant decrease of 50% ($t(3)=2.306, p<0.05$). From 2014 to two months post-intervention the total amount of pressure ulcers, facility acquired and present upon admission, showed a decreasing trend, but the change was not statistically significant ($t(4)=.415, p>0.05$). A confounding variable that influenced the data on the total amount of pressure ulcers as well as those present upon admission is that one patient was admitted and readmitted several times over several months. This patient also had multiple pressure ulcers present upon admission with each admit. During the months of December 2014 and January 2015
there was one patient who had six pressure ulcers upon admission from the hospital. This increased the numbers of pressure ulcers that month as that patient was sent to the hospital and then readmitted to the NH several weeks later with an increase in pressure ulcers. It is important to note that one patient had more than one wound to understand a spike in wounds from one month to the next. For January, there were 22 wounds among only 10 patients, showing multiple wounds for one person.

The project manager also looked at secondary data with Braden Scores and Albumin levels pre and post-intervention. The relationship between 2014 \( (r(39)=.296, p>.05) \) Braden scores and albumin levels and two months post \( (r(39)=.282, p>.05) \) both showed a weak correlation with no significance. It was noted that not all patients had recent albumin scores or only had two results to review. If there were multiple albumin levels to review, such as monthly, there would be more data to compare with to assess trends. It is noted that Braden scores are done quarterly, for new admits, and when there is a falls or status change. Stable patients had only two Braden scores to assess while others with changes or readmits had several to evaluate trends.

Halfway through the project, during October/November 2014, there was an unrelated incident which brought the Board of Health to investigate. They were present in the building for over a week. During this time, the APN was asked to postpone coming to the facility that week. After this incident, there was an increase in pressure ulcers during one week time. It is important to note that this was found on one unit where none of the nurses who were participating in this project were working. With the increase in pressure ulcers, a one-on-one educational session was provided on pressure ulcer prevention and the PUPPI tool by the project manager and the Assistant Director of Nursing. With this education, the wounds that were acquired during that time were healed quickly, and within two weeks, all were healed. This data suggest that not only
did the education help, but the presence of the APN may also be an influential factor to encourage proper protocols are being followed.

Stage IV pressure ulcers showed a significant decrease two months post-intervention ($t(4)=3.333, p<0.05$) which correlates with the best evidence found on education and protocol tools decrease pressure ulcers. During the project and two months post-intervention there was a decrease in the most severe stage of pressure ulcers with Stage IV’s. There were several wounds that changed status from one week to the next during the project. Some healed from Stage III to Stage II and others changed from Stage II to eschar, Unstageable pressure ulcers. These changes can affect the data not only in the number of wounds, but also each type of wound from month to month. There was an increase in the Unstageable pressure ulcers two months post-intervention as several wounds changed to scabs or eschar. With the education provided, the nursing staff has more knowledge on correct staging for wounds, which could explain why there were more Unstageable wounds as they were previously staged differently.

There was also a noted change in Braden Scale scores from falls. For example, there was a patient with a very low risk Braden Scale score in 2013 who recently fell. The patient’s score changed to high risk since she fractured her hip which led her to be bed bound. Scores are calculated upon admission, readmission, and quarterly. With such a change in a patient status, falls can increase risk for pressure ulcers which is reflected in the decreased Braden Scale score.

Not only did a change in nurse staffing potentially affect this project, but also the turn-over of providers. There was a physician and an APN specializing in wounds and infection that would round four to five days a week during 2013 with much lower wound rates than currently. However, that pair of providers no longer rounds at the facility, which may have contributed to a higher pressure ulcer rate in 2014. In examining the
incidence of pressure ulcers, 2013 had a much lower rate than 2014, which could have been affected by this turn-over change.

Overall, the results of this EBP project support the literature found on pressure ulcer prevention with a decrease in pressure ulcers after implementation of education and protocol prevention tools. The effect of a pressure ulcer prevention tool and staff education, as compared to usual care, showed a significant decrease on the incidence of Stage IV pressure ulcers, a decrease trend in all pressure ulcers, a significant decrease in facility acquired pressure ulcers as well as a significant decrease in patients with facility acquired pressure ulcers, over a three-month period. There are multiple layers to pressure ulcer prevention, but as a whole there is one common goal. Education, protocols, assessment tools, and staff training are all important parts of pressure ulcer prevention evident in the review of literature and this EBP project.

**Applicability of Florence Nightingale Environmental Model**

Implementation of the PUPPI tool addressed several areas of assessment which are all included within Nightingale’s Environmental Model which relates well to this EBP project. Environmental aspects of care have several application to this project such as providing clean linen, encouraging activity, and using proper support surfaces based on risk for pressure ulcers. Personal cleanliness through bathing and use of Chlorhexidine wash in addition to the application of skin barrier cream after care are interventions that were performed with the PUPPI tool. Another key concept is nutrition. Adequate hydration and nutrition, an albumin level of 3.5 g/dl or greater, was addressed (Catania et. al., 2007; Serpa & Santos, 2014). Those patients’ albumin levels who were below 3.5 g/dl were initiated on supplements, and the dietitian was requested to coordinate care.

Several more concepts from Nightingale’s Environmental model include: cleanliness of the environment as a whole, ventilation, lighting, and noise. Providing a clean environment that is well ventilated, and has adequate lighting, and keeping noise
to a minimum is conducive to the healing process which was addressed. Another concept within the Environmental Model is entitled “chattering hopes and advices.” This concept refers to providing good information in order to assist with healing and to avoid false hope. The nurses provided report on their patients at the end of their shift, including the PUPPI tool, which was in an easily accessible location.

Furthermore, the concept of observation of the sick was delivered through education from the project manager with an educational session regarding types of pressure ulcers, the PUPPI tool, pressure ulcer prevention, and statistics on pressure ulcers. With the educational sessions and one-on-one education, nurses were provided with the knowledge of preventing pressure ulcers through observation. Finally, the concept of social considerations is addressed, by assessing those at high risk for pressure ulcers based on their Braden scores, and ensuring their needs upon discharge are met based on the recommendation of the PUPPI tool. Florence Nightingale’s Environmental Model correlates well with pressure ulcer prevention, and was influential in guiding this EBP project.

**Applicability of the Stetler Model Conceptual Framework**

For this EBP project, a plan was devised according to the Stetler Model following the five phases which was a fitting framework to guide this project. This practitioner-oriented model is a step-by-step instruction for integrating research into practice. The project manager used all five phases of this model during this EBP project including: preparation, validation, comparative evaluation with decision making, translation and application, and evaluation. In phase I, the project manager prepared with identifying a need to prevent pressure ulcers in NHs by the high national average statistics. The project manager reviewed the most current evidence about pressure ulcer prevention. During phase II, assessment of the body of evidence was done by critiquing research found, then choosing and summarizing evidence as it relates to need of pressure ulcer
prevention in NHs. In phase III, a set of utilization criteria was applied to the evidence, labeling, condensing, organizing, and attributing meaning to all evidence collected was done. In addition, decisions were made related to the evidence fitting within the NH setting, feasibility, substantiating evidence, and current practice was also performed.

For phase IV, translating and applying the research to this EBP project, converting findings into the type of change to be made, and adopting the implementation of evidence based findings was done by the project manager. This was done by providing education to the staff on pressure ulcer prevention, developing and implementing the revised PUPPI tool, and providing PowerPoint slides and posting flyers on pressure ulcer prevention education. Finally in phase V, evaluating the effectiveness of the PUPPI tool, ease of use of the tool, and most importantly, the reduction in the rate of pressure ulcers was performed. The Stetler Model was effective for this EBP project in guiding the process of implementation.

**Perceived Barriers**

During this project, there were several barriers that could have affected the results. Within NHs, there tends to be a higher turn-over of staff than other types of healthcare facilities. Turnover rate in long-term care is a significant problem, with rates ranging from 55% to 75% for nurses in NHs (Barbera, 2014). There are many costs associated with high turnover rates, including increased hospital readmission rates, financial strains, poorer quality of care, a decrease in staff and resident morale with job dissatisfaction, increased work stress and overtime, increased accident and absenteeism rates, and resident and family dissatisfaction (Barbera, 2014).

Another barrier was only including the nurses for the education on pressure ulcer prevention. Further research should include educational sessions provided to all patient care staff including nurses, non-licensed care providers who have little health care training in NHs such as nursing assistants, and qualified medication aids. This EBP
project limited the education to only the nurses, but by extending it to other patient care staff could help with further prevention of pressure ulcers. Finally, a limitation was having only half the nurses participate. Participation was voluntary, but that decreases consistency of care when only half were trained in pressure ulcer prevention and half were not.

**Strengths of the EBP Project**

The topic of pressure ulcer prevention is important, which is a strength driving this project. The project manager was available for one-on-one teaching during the project which helped the nurses to continue to provide preventative care and answer any questions with utilizing the PUPPI tool. Another strength is the support provided by the director and assistant director of nursing. They provided help to the nurses when the project manager was not in the building. The decrease in Stage IV and facility acquired pressure ulcers two month post-intervention showed an important strength of this project as well as a significant decrease in patients with facility acquired pressure ulcers. Having a downward trend in all pressure ulcers is positive, and further research could prove significance.

**Weakness of the EBP Project**

The total amount of nurses at this small facility was about 15, but only 11 nurses participated. The small sample size can be perceived as a weakness. Due to two nurses dropping to part time and one nurse leaving the facility, the final sample size that filled out the survey was eight. The project manager should have obtained the nurses’ demographic data attending the educational session at the start of the project, rather than at the end. This would have been helpful with analysis since there was a three person drop out at the end of the project.

This project was only three months long, with a two month follow through. Increasing the length of this project would further help with the prevention of pressure
ulcers and the reduction of the incidences. Also, further education could be provided with a longer study.

Implications for the Future

Although this EBP project resulted in only a few statistically significant improvements, the literature shows that implementing protocols, prevention tools, and education on pressure ulcer prevention significantly decreases pressure ulcers within NHs. It may be that a longer project with a larger sample size would have more statically significant results. The implementation of the PUPPI tool into daily care, along with quarterly educational sessions, would be beneficial to nursing homes for pressure ulcer prevention. With the increasing numbers of baby boomers, the number of Indiana residents age 85 and older is expected to grow by 48% by 2030 (American Association of Retired Persons [AARP], 2009). Prevention education will be even more important with increased numbers of potential patients in NHs. Implementation of protocol tools are also highly effective based on evidence shown by using the PUPPI tool (Catania et al, 2007). There is proven cost effectiveness with prevention over treatment of pressure ulcers. Importantly, involvement of staff with educational training is crucial to better outcomes. Further research can be done to include all patient care staff with a longer duration of time.

Conclusions

To conclude, there is room for change with pressure ulcer prevention in nursing homes. Even small improvements make a difference. Incidence of pressure ulcers can be significantly reduced and reductions sustained by changing the culture of an organization and adopting evidence-based prevention strategies (Tippet, 2009). Education will be essential to a change within any NH. With a high proportion of non-licensed care providers in NHs who have little health care training, further research should be done to include the knowledge enhancement with educational programs for
the nursing assistance and non-licensed care providers (Kwong, Lau, Lee, & Kwan, 2011). With such important issues and significant statistics, there needs to be a change with the current standard of care regarding prevention of pressure ulcers in long-term care. Providing educational programs to the nursing staff is can assist in prevention of pressure ulcers.

Providing better care, with prevention of pressure ulcers at the center with protocols, education programs, and assessment tools such as the PUPPI tool, will improve quality of care, patient safety, and cost. All factors improve nursing care and decrease deficiencies with health inspections. Pressure ulcer prevention is a multifaceted topic with continuing education and change needed within NHs for better quality of care overall.
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BIOGRAPHICAL MATERIAL

Kristina is a graduate from Ivy Tech State College where she earned a technical certificate in nursing in 2002 and achieved her LPN. An interest in nursing began when her grandmother was diagnosed with ESRD, creating the desire to learn more and understand her disease process. Over the last 15 years, she has volunteered with her mother, helping with holiday toy drives for children while admitted to Stroger Hospital, silent auctions for children with AIDS, collection of baby items for St Monica’s Home, and toys for a local women’s and children’s shelter. Continuing her education in 2004, she graduated from Purdue University North Central with an Associate’s degree in Science of Nursing and obtained her RN. While working as a Post Anesthesia Care Unit Nurse, Medical-Surgical Nurse, and a Pediatric Nurse, she attended Purdue University Calumet for her Masters in Science and passed her FNP certification in 2009. Kristina served as chair and vice chairperson for the Shared Governance Education Council with St. Margaret Mercy Healthcare systems for four years, and has been a charge nurse, and preceptor for new nurses. As a student, she remained on the honor roll with chancellor’s honors as well as the National Deans List, throughout her academic studies and has been an active member of Sigma Theta Tau International Mu Omega Chapter. Kristina is a Certified Nurse Practitioner with American Association of Nurse Practitioners (AANP). Currently, she is attending Valparaiso University to earn a Doctorates in Nursing Practice. She is a member of the AANP and Society of Nurses in Advanced Practice (SNAP). Kristina has submitted her integrative review on education and pressure ulcer prevention in nursing homes to the Journal of Wound, Ostomy, and Continence Nursing. She will also be presenting her poster presentation of her EBP project at the Wound Care Education Institute, Wild on Wounds national wound conference. She currently works as a Nurse Practitioner specializing in Internal Medicine with Infectious Disease and Endocrinology Specialties performing office and
hospital care. She shows compassion for the elderly, specializing in geriatrics, with rounding at local nursing homes. While working full time, she is married and raising two children: Sophia age 4 and Michael age 21 months. Upon completion of her DNP, Kristina will continue to work in the clinical field providing the best EBP care for her patients.
ACRONYM LIST

AARP: American Association of Retired Persons
ANA: American Nurses Association
CDC: Centers for Disease Control
CMS: Centers for Medicare and Medicaid services
EBP: Evidenced based practice
FTE: Full time equivalent
JBI: Joanna Briggs Institute
LPN: Licensed Practice Nurse
NCHS: National Center for Health Statistics
NH: Nursing home
NPUAP: National Pressure Ulcer Advisory Panel
NGC: National Guidelines Clearinghouse
RN: Registered Nurse
Appendix A

Figure 1.A

*PowerPoint Slides*

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The Effect of Education and Utilization of a Prevention Tool on the Incidence of Pressure Ulcers in a Nursing Home in Northwest Indiana

Kristina Scalzitti, MS, FNP, NP-C
Valparaiso University
Evidence Based Practice Research Project
What is Evidence Based Practice

- Evidenced based practice (EBP) describes a model of care whereby Advanced Practice Nurses, using current evidence or research knowledge, make decisions using clinical expertise and patient preferences to guide patient care.
- The highest quality of health care is delivered with the best outcomes.
- For this EBP research project, the APN will be looking at the best evidence based practice for prevention of pressure ulcers in nursing homes.
Statistics

- Historically, pressure ulcers have been documented for thousands of years, with early descriptions in autopsies of Egyptian mummies.
- 1 in 10 nursing home residents have pressure ulcers.
- Development of a pressure ulcer can result in serious outcomes including pain, infectious complications, prolonged and expensive hospitalizations, persistent open ulcers, psychological harm, and increased risk for mortality.
- Prevalence of pressure ulcers in NHs within the past two decades has nearly doubled, increasing overall from 9.2% in 1989 to 15.5% in 2003-2004 and nosocomial prevalence increasing from 5.6% to 10%.
- Globally, as of 2010, pressure ulcers resulted in about 42,600 deaths, which is a 32.5% increase from 1990.

(Bangova, 2013; Lozano et al., 2012; NCHS, 2009; Tippett, 2009).
Review of the Literature

- Treating wounds is 2.5 times more costly than preventing.
- Implementation of a protocol for along with staff education, reduces the incidence of skin breakdown, including pressure ulcers.
- Implementing protocols and prevention tools while educating the nurses, is a proven benefit and shows direct results of lower prevalence of pressure ulcers.
- Approximately 90% of daily care costs are associated with nurses and nursing assistants’ in treating pressure ulcers.
- In 2005, the average cost for healing a Stage IV ulcer was $37,000.
- Utilization of the Pressure Ulcer Prevention Protocol Intervention (PUPPI) tool, resulted in over 50% decrease in pressure ulcers in a 3 month period.

(Bangova, 2013; Buss et al., 2004; Catania et al., 2007; Derby-Bemis, 2008; EPUAP & NPUAP, 2009; Hunter et al., 2003; JBI, 2008; Lozano et al., 2012; NCHS, 2009; Slade, 2013; Tippett, 2009; Vap & Dunaye, 2000).
Pressure Ulcers

Localized injury to the skin, underlying tissue, or both usually over a bony prominence, as a result of pressure or pressure in combination with shear

Stage I

- Intact skin
- Non-blanchable erythema
- Localized area usually over a bony prominence

(EPUAP & NPUAP, 2009)
**Stage II**
- A partial thickness wound
- Loss of dermis
- Shallow open ulcer with a red, pink wound bed
- Also can present as an intact or open/ruptured serum-filled or serosanginous filled blister
- Without slough

**Stage III**
- Full thickness skin loss
- Subcutaneous fat visible
- Bone, tendon or muscle are not exposed,
- Slough may be present but does not obscure the depth of tissue loss

*(EPUAP & NPUAP, 2009)*
Stage IV

- Full thickness tissue loss
- Exposed bone, tendon or muscle
- Possible slough or eschar present
- Undermining and tunneling and can extend into muscle and/or supporting structures such as fascia, tendon, bone, or joint capsule making osteomyelitis likely to occur

Unstageable

- Wounds with bruising that indicates deep tissue injury
- Wounds with eschar or gangrene

(EPUAP & NPIAP, 2009)
Pressure Ulcer Prevention Protocol Intervention tool (PUPPI)

- This case-control study took place in the James Cancer Hospital at Ohio State University Hospital, showing good results with a decrease in pressure ulcers by over 50% within 3 months.
- They were able to maintain percentage well below the national benchmark on hospital acquired ulcers at 2.9% and below.
- Prior to implementation, the pressure ulcer rate was at 11.1% with hospital acquired at 6.6% and after implementation the pressure ulcer rate decreased to 4.1% with hospital acquired rate at 2.0%.

(Catanian et al., 2007)
Sensory Perception

- Offload and reduce pressure on ankles, heels, and feet with ___ heel protectors or by ___ a pillow to float heels.
- Inspect feet and ankles daily.
- Avoid hot water and heating pads.

Moisture

- Establish a bowel and bladder program for incontinent patients.
- Cleanse skin gently after each incontinent episode with ___ Aloe Vesta Foam Cleanser and ___ soft cleaning wipes.
- Apply skin barrier ointments to bony prominences to protect skin from breakdown and moisture:
  ___ Constant Care Barrier Cream (Prevention) ___ Calmoseptine (Stage I or II).
- Identify fungal infections and treat:
  ___ Nystatin Powder (MD order) ___ Nystatin Cream (MD order) ___ po Antifungal
- Avoid diapers except when patient is out of bed to walk or in chair.
- Incontinence containment devices: ___ Urinary Catheter
Activity

- Encourage increased activity.
- Consult physical therapy if decreased mobility and/or weakness (discuss with MD).

Mobility

- Turn and reposition at least every two hours while in bed or chair:
  ___ Use pillow to offload ___ Use pillows between knees.
- Continue turning every 2 hours on specialty bed.
- ___ Air mattress if high risk or ___ Low air loss bed (if indicated per MD order patients with open wounds).
- Inspect bony prominences daily.
Nutrition

- Evaluate nutritional status of patients who are at nutritional risk, check albumin level per laboratory results. Albumin.
  - If alb < 3.5 inform MD and consult Dietitian and ___Multivitamin (per MD order) and ___Zinc (per MD order) and ___Vitamin C (per MD order).
- Encourage and assist patients to eat and drink nutritional supplements as ordered. Give meds with Med Pass.
- Monitor weights ___Daily ___Weekly ___Monthly
- Clean PEG tube site with warm soap and water daily. ___ Consult Dietitian for PEG tube feedings

Friction & Shear

- Use lift sheets or pads to turn. ___encourage patient to assist. ___ # of needed for assistance ___Hoyer lift
- Elevate head of bed less than 30 degrees (unless on tube feedings).
- Avoid excessive rubbing when cleansing and drying skin.
- ___Use of Chlorhexidine Baths
- Protect from friction. Apply Tegaderm to _____________ Xenaderm to _____________
  Socks to feet ___
Outcomes/Benefits

- Improved quality of care
- Less pain
- Less Infection
- Improved patient outcome
- Increase time with patient interaction
- Improved patient and nursing satisfaction
- Cost effective
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*Use of drawings of wounds is permitted for educational purposes only through the 
National Pressure Ulcer Advisory Panel Website.
## Appendix B

**Pressure Ulcer Prevention Protocol Intervention (PUPPI) Tool, adapted with permission by Kimberly Catania, MSN, RN, CNS, AOCN**

<table>
<thead>
<tr>
<th>Braden Category</th>
<th>Nurse Initials</th>
<th>Date</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>SENSORY PERCEPTION</td>
<td></td>
<td></td>
<td>1. Offload and reduce pressure on ankles, heels, and feet with ___ heel protectors or by ___ a pillow to float heels.</td>
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<td></td>
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<td>2. Inspect feet and ankles daily.</td>
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<td>3. Avoid hot water and heating pads.</td>
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<td></td>
<td>1. Establish a bowel and bladder program for incontinent patients.</td>
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<tr>
<td>MOISTURE</td>
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<td></td>
<td>2. Cleanse skin gently after each incontinent episode with ___ Aloe Vesta Foam Cleanser and ___ soft cleaning wipes.</td>
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<td></td>
<td></td>
<td></td>
<td>3. Apply skin barrier ointments to bony prominences to protect skin from breakdown and moisture: ___ Constant Care Barrier Cream (Prevention) ___ Calmoseptine (Stage I or II).</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>4. Identify fungal infections and treat: ___ Nystatin Powder (MD order) ___ Nystatin Cream (MD order) ___ po Antifungal (______________)</td>
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<td></td>
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<td>5. Avoid diapers to contain effluent except when patient is out of bed to walk or in chair.</td>
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<td></td>
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<td></td>
<td>6. Incontinence containment devices: ___ Urinary Catheter</td>
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<tr>
<td>ACTIVITY</td>
<td></td>
<td></td>
<td>1. Encourage increased activity.</td>
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<td>2. Consult physical therapy if decreased mobility and/or weakness (discuss with MD).</td>
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<td>MOBILITY</td>
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<td></td>
<td>1. Turn and reposition at least every two hours while in bed or chair: ___ Use pillow to offload ___ Use pillows between knees.</td>
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<td>2. Continue turning every 2 hours on specialty bed.</td>
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<td>3. ___ Air mattress if high risk or ___ Low air loss bed (if indicated per MD order patients with open wounds).</td>
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<tr>
<td></td>
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<td></td>
<td>4. Inspect bony prominences daily.</td>
</tr>
<tr>
<td>NUTRITION</td>
<td></td>
<td></td>
<td>1. Evaluate nutritional status of patients who are at nutritional risk, check albumin level per laboratory results ___ albumin. -If alb &lt; 3.5 inform MD and consult Dietitian and ___ Multivitamin (per MD order) and ___ Zinc (per MD order) and Vitamin C (per MD order).</td>
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<td></td>
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<td>2. Encourage and assist patients to eat and drink nutritional supplements as ordered. Give meds Med Pass.</td>
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<td>3. Monitor weights ___ Daily ___ Weekly ___ Monthly</td>
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<td></td>
<td>4. PEG tube site care with warm soap and water daily. ___ Dietitian Consult for nutritional needs with PEG tube feedings</td>
</tr>
<tr>
<td>FRICITION &amp; SHEAR</td>
<td></td>
<td></td>
<td>1. Use lift sheets or pads to turn. ___ encourage patient to assist. ___ # of needed for assistance ___ Hoyer lift</td>
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<td>2. Elevate head of bed less than 30 degrees.</td>
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<td>4. ___ Use of Chlorhexidine Baths</td>
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<td></td>
<td>5. Protect from friction. Apply ___ Tegaderm ___ Socks to feet ___ Xenaderm to ________________.</td>
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</table>
Appendix C

PUPPI Survey

Pressure Ulcer Prevention Protocol
Intervention (PUPPI) Survey

Age: _________
Male or Female
RN or LPN

Years of Practice:  0-3 yrs  4-7 yrs  8-11 yrs  12-15 yrs  16-19 yrs  20-23 yrs  >24 yrs

Please answer the questions below regarding your experience with using the PUPPI tool and education on pressure ulcer prevention. All answers are kept anonymous and confidential and will be used for educational purposes.

1. Was the education session prior to initiation of the PUPPI tool beneficial?
   Yes  No  Somewhat

2. Did you find the PUPPI tool helpful in assessment for pressure ulcer prevention?
   Yes  No  Somewhat

3. Was the PUPPI tool time consuming?
   Yes  No  Somewhat

4. Was the PUPPI tool easy to use and follow?
   Yes  No  Somewhat

5. Were you confident in using the PUPPI tool?
   Yes  No  Somewhat

6. Would you recommend adding this tool to your daily routine for pressure ulcer prevention?
   Yes  No  Somewhat

Please feel free to write comments below on ways to improve or change the PUPPI tool or the presentation for pressure ulcer prevention.
Don’t forget to take care of your PUPPI today!

Pressure Ulcer Prevention Protocol Intervention
Sensory Preception

Activity

Moisture

Pressure Ulcer Prevention

Protocol Intervention

Friction & Shear

Mobility

Nutrition
Pressure Ulcer Prevention Protocol Intervention

Advantages to having a PUPPI:

- Improved Quality of Care
- Cost Effective
- Improved Patient Outcomes
- Increase Time with Patient Interactions
- Less Pain
- Improved Patient and Nursing Satisfaction
- Less Infection