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Effects of Education on Pressure Ulcer Prevention in Developmentally Disabled Individuals

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Abstract

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MS, Walden University, 2014

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Project Submitted in Partial Fulfillment

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Abstract

Pressure ulcers were a continuing concern among the nonverbal developmentally disabled population of a state institution. The lengthy use of wheelchairs, the inability to body shift, and physical and mental impairment were attributes of the target population that have been cited in the literature as contributing to pressure ulcer. The purpose of this quasi-experimental pretest/posttest project was to evaluate the effectiveness of an education intervention for direct care staff on the prevention treatment, and eradication of pressure ulcers among patients with developmental disabilities. Orem's self-care deficit theory, particularly the emphasis on the need for nursing staff to perform self-care activities for persons who are unable to manage the activities themselves, was the theoretical basis of the project. The Iowa model of evidence-based practice provided the evidence translation direction for the project. All licensed practical nurses and healthcare technicians employed by the institution were invited to participate in the education. Participants completed a pretest on pressure ulcer prevention and management knowledge before the education was presented, and after the educational component of the project concluded. Statistical significance of the differences in pretest to posttest scores was not calculated because the sample size was small (n = 37); however, all participants achieved 100% correct answers on the posttest up from a 50% mean score among licensed practical nurses and a mean score of 30% among health care technicians. Social change was evaluated within the institution by a decrease in new pressure ulcer cases to zero in the week following the education, and a commitment from the director of nursing to provide pressure ulcer education to all new direct care employees and refresher courses for continuing employees.

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Section 1: Overview of the Evidence-Based Project

Introduction

Pressure ulcers (PU) affect a significant number of individuals. PU is categorized as a localized injury to skin or underlying body tissue that usually occurs over bony prominences (National Pressure Ulcer Advisory Panel [NPUAP], 2015). There are various categories/stages of pressure ulcers that result from pressure on the underlying skin or a combination of pressure and shear to a particular area. These stages range from a nonblanchable erythema to partial or full thickness skin loss and unstageable injury of unknown depth (NPUAP, 2015). This debilitating disease is costly and has a high mortality rate (NPUAP, 2015). PU are preventable, but require a considerable amount of effort and dedication by patients and care providers to decrease the prevalence.

There are several factors that increase the prevalence of PU in any population. They are (a) wheelchair use, (b) the presence of a shunt, (c) urinary incontinence, (d) amputation above the knee, (e) a recent surgery, (f) male gender, (g) obesity, (h) inability to position change, and (i) residence in a nursing home (Kim et al., 2015). Healthy People 2020 (2012) highlighted the problem and placed PU prevention as one of their goals. Pressure ulcer is a disease that is preventable, but serious complications can occur if not prevented or cured. Individuals who remain in one position for an extended period of time or have a certain body part receiving constant pressure will develop ulcers (NPUAP, 2015).

This project was intended to provide education to nurses and other care providers on ways to decrease and prevent PU. Decreasing the occurrence and prolongation of PU will contribute to positive social change by decreasing the morbidity and the subsequent financial burden on patients and the health care system. Upward of 2.5 million people have pressure ulcers each year and over 60,000 die (Sendelbach, Zink, & Peterson 2011). Furthermore, the treatment cost for one ulcer ranges from $10,000 to $86,000 per person, totaling over $11 billion annually (Sendelbach et al., 2011). The most recent epidemiologic information from the Centers for Disease Control and Prevention (CDC) on PU stated that one in every 10 nursing home patients suffers from pressure ulcer (CDC, 2009). Other statistics from the CDC (2009) revealed that (a) long-term care residents and hospital patients 64 years of age and older have a 14% likelihood of developing PU, (b) males have a 13% likelihood, and (c) residents who have less than a 1 year stay in a long-term care facility have a 16% probability of developing PU. Patients and residents with substantial weight loss and those suffering from incontinence are also at high risk.

This project was intended to target the developmentally disabled (DD) population. Because of the broad scope of the DD population, emphasis was placed specifically on DD individuals who are both nonambulatory and nonverbal, factors that make them particularly vulnerable to the development and prolongation of PU. The inability to change position independently or to communicate needs places DD patients at high risk for developing PU. Therefore, it is important for care providers to anticipate their needs

and deliver patient-centered care. PU can be prevented, but it takes the collaboration of every member of the interdisciplinary team.

Background

This project was conducted at a long-term care facility that has a high occurrence of PU among the patient population. Internal data identified that 35% of the population were afflicted with PU. Compared to the most recent nursing home statistics published by the CDC (2009), which indicate 2% to 28% of people in this setting suffering from PU, the percentage at this institution is high. The population of DD residents who were addressed by this DNP project are unable to communicate their needs and depend totally on their care providers. These care providers are Registered Nurses (RNs), Licensed Practical Nurses (LPNs), and support staff. The support staff members are Health Care Technicians (HCTs) who had no medical training. They were hired and placed on the hospital units to assist patients with activities of daily living (ADL) and instrumental activities of daily living (IADL). They are given a 2-week orientation on the unit, but they lack the necessary knowledge of the rationale for turning and changing patients. Additionally, they often contribute to the pressure ulcer problem by causing shear ulcers from improper positioning and diaper removal. These observations give credence to Florence Nightingale's statement that PU is not to be blamed on the disease but on the delivery of nursing care (Lyder & Ayello, 2008). This is substantiated in a report by Moore (2010), who highlighted a study that showed 79% of 740 nurses had knowledge of PU prevention, but only 68% had actually implemented that knowledge. The knowledge deficit at the clinical site for this project can be attributed to both the nursing and HCT

staff. Murray (2012) emphasized that training assistants in nursing (AINs) on PU prevention decreased pressure ulcer injury from 11% to 7% in a private hospital.

Problem Statement

The problem addressed by the project was the high rate of new, reoccurring, and nonhealing PU among residents with DD in a long-term care setting compared to national benchmarks. Patients at this site suffered severely from pressure ulcers. This condition was caused by lack of position change, skin tear as a result of shear, compromised skin due to delayed diaper change, and poor judgment on the part of care providers. Several patients had PU that healed and reoccurred within days, others had ulcers that lasted for years. According to the NPUAP (2013), all PU can heal if the proper attention and treatment is rendered. Therefore, it was necessary to provide the needed attention by providing evidence-based information through education.

Purpose Statement and Project Objectives

The purpose of this DNP project was to provide an educational intervention to nurses and other care staff regarding prevention and treatment of PU in DD patients. The DD population encompasses a broad spectrum of individuals; therefore, for the purpose of this project, only DD patients who were nonverbal and immobile were considered. The target population were current residents at a state hospital. This project was important due to the vulnerability of these patients and their dependence on care providers. Staff members were educated on ways to prevent the development and advancement of PU. The objectives for this educational intervention project were (a) teaching nursing actions geared at preventing and eliminating PU, and (b) evaluating the effects of the nursing

education through a pretest/posttest design. The long-term objective of the project was to decrease the incidence and prevalence of PU in the facility.

Project Question

The question that was answered by this project was: Did an educational program increase the knowledge of PU prevention and treatment among care providers at a state residential institution?

Frameworks for the Project

The Iowa model of evidence-based practice was used as the evidence translation framework for this project. This model includes steps to identify the problem, incorporate literature critique to identify high level evidence, and initiate the necessary change process. Dorothea Orem's self-care deficit theory was useful for situating the project goal of PU reduction within the scope of nursing practice and responsibility.

Evidence-Based Significance of the Project

Several national organizations are interested in the eradication and prevention of PU. Healthy People 2020 (2012) listed PU prevention as one of its primary goals. The CDC has PU prevention and elimination as a major goal. The NPUAP has developed evidence-based criteria and documentation on dealing with and preventing PU. Despite the public and professional emphasis on the problem, PU continues to plague the at-risk population. The Centers for Medicare and Medicaid Services (CMS) stated in 2008 that they will refuse to pay for PU caused while patients are institutionalized or hospitalized (Cooper, 2013). Therefore, every effort should be made to educate care providers on the necessary steps to eliminate the problem. If this institution loses its Medicare and

Medicaid funding, it would have to close. If this happened, the DD population may be unable to find suitable housing accommodations.

Eliminating the problem of PU would lessen the financial burden on the state, along with alleviating unnecessary discomfort felt by the patients. Patients were sent to an outside wound clinic to have their wounds debrided several times per month. Paying an outside provider for wound care was costly. Other costs incurred were transportation and increased payroll cost to provide care staff to accompany these individuals to wound clinic appointments.

One other factor necessitated the implementation of this project. Over the years, much research has been conducted on PU development and treatment, but none of the studies specifically targeted the DD population. The focus of previous studies has been elderly patients residing in nursing homes, community settings, and acute care settings (NPUAP, 2015). Only a few studies looked at people with spinal cord injuries (Byrne & Salzberg, 1996; Ferguson, Wittig, Payette, Goldish, & Hansen, 2014). While patients with spinal cord injury may be sedentary, they can communicate their needs, can advocate for themselves, and can be taught how to prevent and heal PU. The DD population addressed by this project were incapable of learning about PU management. This project was instrumental in highlighting the fact that educating nurses is essential to decreasing the PU incidence and prevalence in this population.

Nature of the Project

The DNP project used a quasi-experimental pretest/posttest design to determine the effect of education on staff knowledge of PU. This project entailed educating nurses

and care staff on the ways to decrease PU and eliminate the already existing ulcers. It was important to apply this quality improvement initiative that targeted and improved the skills of care providers caring for residents with DD (Garman & Scribner, 2011). It is the responsibility of all organizations to provide the necessary continuing education to facilitate patient-centered care. There was no doubt that PU was a problem at this institution and that the patients were incapable of helping themselves. Therefore, it was necessary to provide the education needed to foster a PU-free environment and measure the outcomes of that education.

Definitions

Category/Stage I: Nonblanchable Erythema: Skin that is intact and shows no signs of blanching when touched. This area may show signs of redness in clear colored skin, where as in darkly colored skin there may be no visible sign of blanching or color. The area is usually soft, firm, painful, and warmer or cooler compared to surrounding tissue. This stage may be difficult to detect in individuals with dark colored skin (NPUAP, 2015).

Category/Stage II: Partial Thickness Skin Loss: This stage is not used to describe tape burns, skin tears, or perineal dermatitis, but bears the resemblance of open skin with partial loss of dermis. It may present with intact skin in the form of a blister filled with serous fluid. It may also present with a dry shiny appearance without slough (NPUAP, 2015).

Category/Stage III: Full Thickness Skin Loss: Although bone, tendons, and muscles are not visible, subcutaneous fat may be easily seen. There may be the presence

of undermining, tunneling, and slough. This stage is dependent on the body part affected. Areas such as the ears and nose that do not have much body fat may have a shallower crater versus the buttock area (NPUAP, 2015).

Category/Stage VI: Full Thickness Tissue Loss: Exposure of bone, tendon, and muscle, with evidence of slough or eschar present. There is presence of undermining and tunneling. The depth of this stage varies depending on the body part involved. At this stage, the wound is deeper than the nerve endings (NPUAP, 2015).

Unstageable: Depth Unknown: Full thickness tissue loss where the base of the wound is undetectable due to slough and eschar. In order to determine the stage accurately, the removal of dead tissue is essential (NPUAP, 2015).

Developmentally Disabled (DD): For the purpose of this project, patients who are developmentally challenged, unable to communicate their needs, are cognitively impaired, and unable to position change.

National Pressure Ulcer Advisory Panel: An organization of several different groups that deals with the etiology, incidence, and prevalence of PU (NPUAP, 2015).

National Clearing House Wound Care Guidelines (NCHWCG): A national website that provides information on staging and treating ulcers, recommendations as to treatments, and educational information on assessing people with wounds and PU (NCHWCG, 2013)

Slough: Classified as dead skin on a sore or ulcer (NPUAP, 2015).

Assumptions

Change can happen if it is strategically planned and implemented in a positive manner, along with the presentation of evidence-based material. I assumed that all nurses working at this institution shared the objective of the American Association of Colleges of Nursing (AACN; 2006) of welcoming new knowledge to improve their practice and the outcomes of their patients.

Additionally, I also believed that the organization would have welcomed the findings of this study and use the recommendations to advance patient care. If the recommendations are accepted and implemented strategically, then the prevalence of PU at this institution would decline and, ultimately, be eradicated. Finally, I hoped that this research project would initiate more research on the topic of eliminating PU within the DD population.

Limitations

One limitation of this study was the time frame allotted to complete the project. Initially I expected this project to be implemented within 2 months. I further anticipated that there would also be a time constraint in getting the participation of all nurses and care staff. Many employees worked on a *pro re nata (*PRN) basis and may not have been scheduled to work during the week(s) of the education. To alleviate this situation, permission was requested from the nurse executive to notify all relevant staff about the upcoming training weeks. During the weekly meetings, the nurse manager/nurse executive reminded all staff about the upcoming training. Additionally, e-mails were sent out to relevant staff about the training sessions.

Dealing with the issue of PU will contribute to social change within the DD population in different ways. The effects of health education have an impact on the trajectory of health care (Chena, Yang, & Guangya, 2010). Thus, educating nursing and care staff on the special needs related to PU in the DD population would open the door for additional education. In addition, the idiosyncrasies of caring for this vulnerable population were highlighted, making it easier to attend to the residents' needs. The implementation of this project not only educated nursing and care staff at this specific facility, but decreased the number of existing PU cases.

Summary

Pressure ulcers are preventable and can develop serious complications if not identified and treated in a timely manner. Individuals who remain in one position for an extended period of time or have a certain body part exposed to constant pressure will develop ulcers (NPUAP, 2015). DD patients are especially vulnerable because they cannot communicate their needs. Additionally, the CMS refused to pay for PU caused while patients are hospitalized or institutionalized (Cooper, 2013). Therefore, it is up to all members of the interdisciplinary health care team to collaborate and prevent the incidence of this disease. Section 2 will evaluate evidence as it relates to PU development and eradication and look at the role of staff education in decreasing PU.

Section 2: Review of Scholarly Evidence

Introduction

The clinical practice problem for this DNP project was the high incidence of PU among residents with DD in a state residential facility. The purpose of the project was to present an educational intervention to nurses and care staff, regarding prevention and treatment of PU in DD patients. Patients with DD are unable to help themselves; therefore, they rely on nurses and care staff for their daily needs. These staff were instructed on the proper ways to assist these individuals. Thus, the long-term intended outcome would be the elimination of all PU. In order to accomplish PU eradication through an evidence-based nursing education program, it was essential to review scholarly literature. This section of the DNP project presents the current evidence on PU prevention and treatment and explains the strategies used to collect the information. In addition, I assess the relevance of the research as it relates to the nursing clinical practice problem. Additionally, this section provides the background and context of the project, along with a description of the evidence translation model and the theoretical orientation of the project.

Literature Search Strategy

The literature search strategy involved the search of several databases: The Walden Library Databases, the Cochrane Database of Systematic Reviews, and the CINAHL Plus with Full Text. Key search terms used on the selected databases included *developmental disability*, *disabled individuals, wound care, pressure ulcers*, and *nursing education*.

The scope of the literature review involved a search of peer-reviewed literature from 2010 through 2016, written in the English language, and available in full text review. The searches that included any combination of the words *pressure ulcer*, *disability* or *disabled* yielded no results. Therefore, the search terms and time frame were changed to *pressure ulcer* and *nursing from 2000 to 2016*. The Cochrane Database of Systematic Reviews yielded over 200 results, which were narrowed down to 10 results with the inclusion of the word *education*. Of these results, two were abstracts with no available information and did not fit the current project. They appeared to be studies currently under way with no conclusions. Three articles dealt with nursing curriculum, which was not adequate for the project in a clinical setting. Three articles dealing directly with pressure ulcers and nursing education that were appropriate for this project were chosen. These articles were (a) "Knowledge of Pressure Ulcer Prevention: A Cross-Sectional and Comparative Study Among Nurses" by Hulsenboom, Bours, and Halfens (2007); (b) "Certification and Education: Do They Affect Pressure Ulcer Knowledge in Nursing?" by Zulkowski, Ayello, and Wexler (2010); and (c) "Decreasing Pressure Ulcers Across a Healthcare System" by Sendelbach et al. (2011).

The article by Hulsenboom et al. (2007) assessed nurses' knowledge by presenting them with a PU questionnaire. Initially, 522 nurses were given the questionnaire and then educated on PU prevention. At the end of 12 years, the same questionnaire was given to 351 nurses and the analysis was conducted. The hypothesis was that pressure ulcer care would improve by increasing nursing knowledge. The data collected focused on three areas: (a) how much nurses working at a particular hospital

knew about the current PU preventive measures, (b) the differences between nurses who care for PU patients on a daily basis versus nurses who do not, and (c) PU knowledge among the nursing staff after a 12-year period. The researchers concluded that the knowledge of PU prevention in a hospital setting was moderate among nurses, and educating them increased the knowledge on the subject, but if they did not deal with PU on a consistent basis, the knowledge decreased over time.

The article by Zulkowski et al. (2010) highlighted a study done with 460 nurses to determine if wound care certification and nursing education had an impact on decreasing the prevalence of PU. The study concluded that certification and education significantly improved nurses' performances and decreased PU in the hospital setting. Lack of knowledge places patients at risk for compromised skin, increased ulcer formation, and prolongation of ulcers, which ultimately increases the prevalence of the disease. Knowledge deficit among nursing staff increases PU-related health care costs and mortality rates among patients.

The final article addressed PU in an acute care setting. It highlighted the fact that 2.5 million patients are affected by PU each year, and over 60,000 die (Sendelbach et al., 2011). The study consisted of a PU prevention program with 10 participating hospitals conducted within a health care system in Minnesota. In addition to PU education, information was made available via intranet for all nurses to review at their leisure, and whenever they had questions relating to PU. Videos addressing PU and PU prevention were shown on TV screens in each patient room. A large picture with an iceberg was placed on the door of all patients at risk for PU. This picture represented the notion that

compromised skin usually has much more going on underneath the surface. Additionally, a “Skin Day” was established to raise awareness of PU in all facilities. Ultimately, these educational interventions resulted in a 33% drop in PU incidence in all participating Minnesota hospitals.

These articles, along with other appropriate websites such as the CDC, NPUAP, the National Institute of Health (NIH), and the National Clearinghouse Wound Care Guidelines (NCWCG), support the project intervention. Contributions from these websites were very instrumental in guiding the literature analysis, pretest and posttest, as well as materials to be used in the education of the staff. Additionally, information from these websites will eventually contribute to the evaluation of the project. (NPUAP, 2015; CDC, 2009; NIH, 2016; NCWCG, 2013). These resources will be discussed further in the next subsections.

There was no peer-reviewed literature addressing PU in the DD population. However, Dr. Braden of the Department of Economic Security in Arizona addressed this issue. Braden’s comments were centered on the fact that, due to their disability, the DD population is at great risk for developing PU and should be monitored closely (Braden, 2009). Because PU is a result of lack of repositioning, those with a cognitive impairment are at higher risk. They lack the ability to communicate the need to move or to report that a pressure area is uncomfortable. Braden explained that additional causes of PU are wrinkled sheets, crumbs in the bed, wheelchair use with an uneven tilt, creases in clothing, persistent perspiration, friction where one body part is constantly rubbing

against another body part, and shear where skin moves in one direction and the bone or muscle moves in another direction (Braden, 2009).

Relevance and Contribution to Nursing Practice

This project has the potential to advance nursing practice because it deals with an important issue in a population that has not been studied widely. PU is such a problem in health care settings that the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and also the CMS focused attention on how patients with wounds are treated (Zulkowski et al., 2010). In 2005, the CMS raised the question of the knowledge deficit of health care workers relating to wound care. Specific focus was placed on nurses. Although patient care is done by a multidisciplinary group, nurses are the primary caregivers on a day-to-day basis and delegate patient cares to other staff members.

Several recommendations on wound care prevention are listed by the NPUAP (2015); they include implementation of the Braden Scale, identification of risk factors such as nutritional deficit, skin assessment, frequent turning, keeping skin clean and dry, the use of barrier protectant for the skin, and avoiding vigorous rubbing to skin areas with the potential for breakdown. Additionally, other strategies have been used to target the problem.

One strategy used by the CMS to help alleviate this problem is their refusal to pay for PUs developed while patients are hospitalized (Cooper, 2013). This keeps providers vigilant when dealing with patients who have the propensity for skin to breakdown.

Therefore, the use of existing research covering PU in other populations was very useful in beginning the process of addressing the issue among the DD population.

General Literature

The NPUAP served as a resource throughout this project, along with the NCHWCG. The NPUAP provided information on identifying and staging PU, along with up-to-date treatments. The NCHWCG is a national website that provides information on staging and treating ulcers and educational information on assessing people with wounds and PU. Most of the educational literature was an adaptation of nurse education material used by Primaris, a quality improvement organization contracted by the CMS to develop educational materials for health care.

Conceptual Models and Framework

The 1960s and 1970s saw a great expansion in the development of theories, models, and frameworks to guide nursing practice. This era saw the beginning of several conceptual models and theories coming out of the metaparadigm of the nursing discipline (Masters, 2010). The Iowa model of evidence-based practice was used in many educational projects and will be used as the evidence translation model for this project. This four-phase model places emphasis on looking at the health care system holistically from the standpoint of the provider, the patient, and the infrastructure, while utilizing research to guide practice (Dontje, 2007). This model involves identification of the problem, literature critique, identifying research evidence, and finally, the initiation of a change in practice. Specifically for this project, the Iowa model was utilized by looking at the holistic care for the DD population using evidence-based methods as a driving

approach. Evidence-based methods were incorporated in the educational materials that were presented, which contributed to a change in practice related to how the institution deals with PU.

In addition to the Iowa model, Orem's self-care deficit theory was used to illustrate the nurse's role in helping this patient population. This theory was developed to improve the care delivered by nurses in the hospital setting (Banfield, 2011). The basic premise behind the theory was that people should be self-reliant, caring for themselves and their family. When patients cannot provide self-care, as is true of the DD population in the state institution, they are dependent on the knowledge and abilities of the caregiver to provide the necessary care. Other facets of Orem's theory highlight the fact that patients are distinct; nursing is an integrative action between two people; the success of primary health care prevention constitutes successfully meeting the needs of the patient; and the fact that self and dependent care are learned within context of a socio-cultural environment (Banfield, 2011). For this project, the use of the Orem's model illustrated that the DD population is dependent on nursing and care staff for their everyday needs. The uniqueness of this population necessitates integrated work by all health care professionals.

Background and Context

The clinical site where this project was conducted served DD individuals with severe cognitive impairment who lacked the ability to position change. Many of these individuals are bedridden and spend most of their time either in the bed or in a wheelchair. This made them prime candidates for the development of PU. These residents

statistically have a 2% to 28% pressure ulcer incident rate (Park-Lee & Caffrey, 2009). PU could be found on these individuals in various stages. These individuals were at risk for sepsis, and ultimately, death. The care of patients with DD placed a strain on the staff rendering care and led to a high turnover. The institution hired LPNs and HCTs for direct patient care, many of whom lacked the clinical knowledge and experience to care for these patients adequately. RNs are hired, but they seldom perform direct patient care; they primarily perform administrative duties. The use of the Iowa model was expected to assist in evaluating the knowledge deficit and locating evidence-based resources to help rectify the problem.

The expertise the researcher brought to this project was the fact that she is an Advance Practice Nurse working as the Wound Care Coordinator for this facility. This position afforded her the opportunity to assess the deficit in nursing knowledge and placed her in a position to be a change agent. Having firsthand knowledge of the needs of the DD patients and the areas that need correction within the facility was an asset to this project. Being an Adjunct Instructor working with two of the local universities, attested to her ability to present the educational component of this project. Additionally, her DNP practicum is at this facility, which provides her with the expertise of a qualified preceptor. The preceptor was instrumental in helping with the collecting and presenting of relevant data.

A bias that she may have had related to this project was her passion for patients with wounds because of personal experiences dealing with PU in a family member. This

bias was used as a catalyst to fuel the passion of being an advocate for patients who cannot advocate for themselves.

Summary

Evidence-based materials presented in this section came from a variety of sources, including the Cochrane Library Databases and other reputable sources. Peer-reviewed articles highlighted the fact that there is a need for educating nurses on PU prevention and treatment. Not only is there a need, but also studies have shown that educating nurses and care staff have decreased PU in many population (Zulkowski et al., 2010). Ultimately, this project has the potential to advance nursing practice, because it deals with an important issue in a population that has not been studied widely. The Iowa model has helped to shape the project and Dorothea Orem's self-care deficit theory has illustrated the nurse's role in helping this vulnerable population. Orem's theory was developed to improve the care delivered by nurses in institutional settings (Banfield, 2011).

Section 3: Approach

Introduction

The clinical practice problem addressed in this project was the high rate of PU in the DD population at a state institution. The purpose of this project was the implementation of a staff educational intervention regarding prevention and treatment of PU in DD patients. In this section, I present the design of the project, highlight the makeup of the project team, and explain the expected project outcomes. Additionally, I describe the target population, explain the data collection methods and analysis, and present the project evaluation plan.

Project Design and Methods

The design for this study was a quasi-experimental pretest and posttest design. The quantitative data collection method incorporated a questionnaire that tested the nurse and care staff knowledge of pressure ulcer development and prevention. This questionnaire (see Appendix A) was adapted from Primaris (2012), which is a Healthcare Business Solutions company, hired by the Medicare Quality Improvement Organization in Missouri to develop educational material for managing PU. This questionnaire was used by permission under their free download disclaimer (Primaris, 2015). Primaris is a business consulting group serving physicians, medical groups, health care systems, and hospitals. Services rendered include educational materials on various health care subjects and solutions to help companies transform their care delivery methods to avoid unnecessary hospitalizations and readmissions of patients. The use of this company has helped many health care facilities to increase revenue and satisfy health care reform

mandates. Other pertinent information that was considered in the collection of the project data were the different categories of staff (RN, LPN, and HCT) and the demographic variables age, gender, and job description.

Project Team

The project team was comprised of five individuals: myself, one nurse manager, a nurse educator, my clinical practicum preceptor, and the nurse executive of the institution. I served as the project manager of the team; the nurse manager was responsible for assisting with the program in general. The nurse executive served in the capacity of a project advisor, and the nurse educator and my preceptor helped to collect and correct pretests and posttests and performed other duties such as administrative functions. I also served in the capacity of the nursing instructor; I disseminated the educational materials and ensured that participants understood the information. Initially, it was expected that the team would meet once per week for the first month, then twice per week for the duration of the project. The project was expected to last 2 months. The first 5 days were designated for the formation and meetings of the team members. Expected duties in the project were to be communicated to each team member at that time. One week was allotted for nursing education. During this time frame, the pretests were to be given to all consenting participants at the time of the education. The pretest was to be administered, collected, and graded by me, the nurse educator, and my preceptor. The participants were not to be provided with the answers to the pretest questions. After the educational intervention, the posttest was administered and collected

and the answers to the pretest/posttest questions were presented. Any final questions or concerns were addressed by me as the presenter or by the nurse educator.

A 7-day time period was built into the project for unexpected occurrences. The final 5 weeks of the project were to be used to assess all collected data, create reports of the statistical analysis, and present the research findings. Because of the involvement of my preceptor and the site being the place of my employment, the formation of the committee took one day versus the estimated 5 days. After the committee was formed, the nurse executive, acting as the project advisor, indicated that the facility was undergoing several changes and her involvement in the project could not extend over several weeks. Therefore, the team had to recalculate the trajectory of the project to get it completed in 2 weeks versus the 2 months originally planned. The nurse executive presented arguments that solidified the fact that training within the institution usually took a maximum of 5 days and suggested that the educational component of the project stay within that time frame. Appendix B shows an outline of project's revised education timeline. In addition to the changes in the project timeline, the project team composition, the number of employees who participated in the project, the data analysis, and the project evaluation and dissemination plan all were modified as the project progressed. The assumptions and changes in project protocol are discussed below.

Products of the DNP Project

Based on the initial project plan, I presented the results of the data analysis from both the pretests and posttests. The nurse educator looked for trends in content areas that were not understood well after the education. The education material were modified as

needed, based on this analysis, and presented to the facility for ongoing PU training. After the assessment was completed, I presented recommendations based on the findings and the literature review. These recommendations were presented initially to the team. The nurse executive could consider the recommendations, present them to her superiors, and initiate the necessary changes in protocol. The products of the DNP project were the pretest and posttest data, the recommendations based on the findings and the literature review, and a plan for future project evaluation.

Population

The nursing staff employed at this state institution at the time of data collection was approximately 150, which comprised 20 RNs, 80 LPNs, and 50 HCTs, all of whom were targeted to participate in the project educational intervention. Fortunately, the nurse executive was a member of the project team; her input served to encourage buy-in for the project. She was asked to ensure that all nurses participated in the project. She communicated to the staff that the program was intended to improve health care delivery across the facility and to make their jobs easier. Participation in the completion of the pretest/posttest questionnaires was voluntary. Several e-mails were sent from the office of the nurse executive informing nurses and care staff about the upcoming education. It was communicated that reduction and/or total elimination of PU within the facility would decrease the number of dressing changes and other activities related to PU development. It was intended that these facts would promote positive staff participation.

Quantitative Method

There are several different quantitative approach methods, but the one most appropriate for this project was the quasi-experimental approach. This approach "examines cause-and-effect relationship among selected independent and dependent variables" (Grove, Burns, & Gray, 2013). Quasi-experimental research in the nursing field helps to determine the effects of nursing interventions among the independent variable (staff education) and the outcome of the dependent variable (PU incidence and prevalence). The institution currently has several educational classes for all employees. One member of my team, the nurse executive, had the authority to approve classes and materials for all nursing and care staff and require participation in the educational portion of this project. Therefore, as mentioned earlier, the nurse executive's expertise was solicited in notifying the staff and approving the educational materials.

All participants were given 20 minutes to complete the pretest. Presentation of the education took 50 minutes, which was followed by 20 minutes for the participants to complete the posttest. Therefore, the total time for each session was 1.5 hours. The class schedule was a morning class (8:00 a.m. to 9:30 a.m.), an afternoon class (2:00 p.m. to 3:30 p.m.), and a late evening class (10:00 p.m. to 11:30 p.m.). To eliminate the possibility of coercion on my part, the Nursing Educator was asked to administer the pretest and the posttest. The tests were to be graded by me, my preceptor, and the nurse educator.

Data Analysis

The purpose of the data analysis was to organize, reduce, and give meaning to the information collected (Grove et al., 2013). Most data analysis is completed on a computer, especially when there is a large amount of data to be analyzed. To analyze the outcome of the educational intervention, descriptive statistics were used to look at percentages and means. A *t* test statistic was used to compare the mean scores on the pretest and posttest. Areas of knowledge deficit after the education were identified and recommendations for filling the knowledge gaps were presented.

Project Evaluation Plan

The results of this project were to be communicated to the facility through a PowerPoint presentation. The information derived from the pretest/posttest questionnaire given to nurses and care staff, was evaluated for the effectiveness of the education. Members of the interdisciplinary team had the opportunity to analyze the results and make the necessary changes. They also had the opportunity to evaluate the findings and determine its effectiveness as it pertained to the organization's goals and mission (Kettner, Moroney, & Martin, 2008). The long-term goal of this project was to prevent PU in this facility, thus reducing the current prevalence, resulting in numbers below the national benchmarks.

There were four stages of evaluation: formative, process, impact, and outcome (Friis & Sellers, 2014). Currently, this project has passed through all the stages, formative, process evaluation, implementation, and impact evaluation. At the end of the project, impact evaluation began and measured the "knowledge, attitudes, beliefs, and

behaviors" of the participants (Friis & Sellers, 2014, p. 400). To measure the changes relative to the baseline, the pretest/posttest design was used as the key outcome evaluation component. In addition to the impact evaluation, a plan for outcome evaluation was developed for the institution

Generation of Evidence

In this section, I highlight how the evidence was collected and describe the individuals who were instrumental in the collection process. I discuss the participants, including the number of participants, their selection process, and the relevance of the participants to the practice-focused question. Additionally, I point out the procedure that I used to collect the evidence, clearly noting that ethical guidelines were followed.

Participants

The initial intent was to set up a project team comprising five individuals including me as the project manager. However, due to time constraints and the availability of the staff, a committee of four was formed including me as the project manager, the nurse executive, the nurse educator, and my Preceptor.

The nurse educator was instrumental in getting the participation of the targeted staff; RNs, LPNs, and HCTs. Several interoffice e-mails and memorandums were sent out from the director of nursing (DON) office encouraging participation in the project. Flyers and posters were posted around the units, conference rooms, restrooms, and hallways highlighting the date and time of each education class. The upcoming education was mentioned at every shift change for the first 2 weeks in July. The plan was to have the participation of at least 100 individuals. Because the institution employs 150

employees in the target employee categories, a proposed target of 100 participants seemed a realistic goal that would enable performance of the planned statistical analysis. In the end, 37 staff members attended the education and completed the pretest and posttest.

Procedure

The technique used to collect the evidence was done in an educational setting. The questionnaire was developed by me working in the capacity of an employee at the site. The PU questionnaire (see Appendix A) was presented to the Nurse Executive and the nurse educator for the institution. The educational component of the presentation was set up in a PowerPoint presentation and was also presented to the Nurse Executive and the nurse educator. Because the facility already had its own educational material underlying the care of PU, I modified the educational material to best fit the needs of the organization. The mandate to allow the educational material to remain the property of the facility was handed down by the Nurse Executive; therefore, the education PowerPoint presentation will not be provided as an appendix in this project final paper. It was agreed that I would deliver the educational component of the study, but the proctor of the pretest and posttest was the nurse educator for the facility. Additionally, the tests were scored by the preceptor and nurse educator, and the findings were handed over to me for analysis.

The educational component of the project took place over 5 days, with the presentation of two classes per day. Initially the AM classes were geared at facilitating employees working on the 11:00 p.m. to 07:00 a.m. shifts. The afternoon classes were presented 1 hour prior to the start of the 3:00 p. m. to 11:00 p.m. shift. On the first day of

the project, no one attended the morning class, and only three staff members attended the afternoon class so a friendly reminder was sent to encourage participation. The nurses and HCTs indicated that they were tired and could not focus on any educational material after being up all night. Therefore, the decision was made to hold one night class starting at 9:30 p.m. on the third day of the educational component of the project. The option remained opened for those who wanted to attend the morning classes. Day two saw a slight increase in the numbers of staff members attending the education; four persons attended the morning class and five persons attended the afternoon class. On day three, three staff members attended in the morning and six participants attended in the afternoon. The scheduled night class had 4 participants. On day four, only 6 staff members attended the afternoon class. On the final day of the education, no one attended in the morning but 6 participants attended in the afternoon. There were a total of 37 participants who attended in the educational intervention.

Protection of Human Subjects

To ensure the integrity of the project and the ability to abide by HIPPA guidelines, the pretests/posttests did not include any identifiers linking them to any of the participants. The tests did have identifiers relating to gender, job description, and age, which would have been instrumental if a statistical analysis had been conducted. In staying within the guidelines of Walden University IRB regulations, I had to operate as an employee of the organization versus a student in my involvement with the project. No participants under the age of 17 were included in the project and no participants were coerced into participation. Walden University Institutional Review Board (IRB) approval

was provided prior to data collection for the project. The IRB approval number is 07-12-16-0401145.

As discussed earlier, the strategies for recruitment involved interoffice e-mail notifications and flyers posted at various locations within the institution. It was emphasized at the shift change meetings how reducing PU would contribute to a more conducive working environment and lessen the stress on patients and workers alike. Participants were informed that their pretest/posttest scores would not affect their work relationship. Therefore, to alleviate anxiety, participants were allowed to randomly draw a five digit number which was placed on both pretest/posttest and used as identifier. The Nurse Executive decided that all pretest/posttest material would be filed within the institution and would not be distributed externally.

The preliminary IRB application was returned with only minor requirements. The most major requirement was having the researcher clearly stating that her involvement in the educational aspect of the study would be in the capacity of an employee versus a student of Walden University. Once that was clearly articulated, the necessary documents were signed by the site representative, the Walden University chair, and approval was obtained.

Analysis and Synthesis

The system that was used to record, track, and organize the evidence was a relatively simple one. The nurse educator presented the pretest and posttest to each participant, collected the pretests and posttests, and graded them. Grading was done through the use of an answer key which allowed for faster grading. After all the tests

were graded, an Excel spread sheet was created by question. The items were entered in by gender, job description, and age. Because of the number of participants in the study, a statistical analysis using a *t* test as originally planned. According to Kelly (2011), statistical analysis is not usually done when there are less than 100 participants.

Maintaining the integrity of the project was done by having one member of the team conducted the pretests and posttests, while another team member presented the education. This procedure eliminated any coercion and maintained the ethical integrity of the project. Due to the small number of participants and the type of data collected, there were no outliners, but on day one of the education there were missing data on the gender and job title. This issue was easily resolved because only three females who were HCTs took the class that day.

Summary

The objective of this project was to target the eradication of PU in the DD population by focusing on nursing education. To accomplish this objective, a quasi-experimental design was used incorporating quantitative data collection and analysis. The proposed data collection and analyses was instrumental in organizing and giving meaning to the collected information (Grove et al., 2013). The findings and recommendations supported the hypothesis of this project that educating nurses and care staff is essential to PU elimination and prolongation

Section 4: Findings and Recommendations

Introduction

The clinical practice problem that was addressed in this project is the high rate of PU in the DD population at a state institution. The purpose of this project was the implementation of a staff educational intervention regarding prevention and treatment of PU in DD patients. This section will present the findings, implications, and recommendations from the project. The source of the evidence was a pretest and posttest questionnaire. The results were entered into a spreadsheet and then analyzed. The findings substantiated the hypothesis that an educational intervention is beneficial in increasing the knowledge of nurses and care staff who will be able to lessen the incidence of PU in the institution's DD population.

Findings and Implications

Appendix C depicts the findings of the study. There were a total of 19 males and 18 females collectively in the study. Only LPN's and HST's participated, no RN's were available. The age range of the participants started at 20 years of age upwards. According to analysis and synthesis of the information, all participants in the project increased their knowledge after the educational component of the study was presented. This was a reflection of all participants scoring 100% on the posttest. It was evident that all LPNs scored at least 50% on the pretest compared to HSTs whose highest mean score was 30% on the pretest. Gender did not play a role in the scores. The results demonstrated that care staff had little or no knowledge of how to care for PU in the DD population. Pretest scores ranged from 30% to 35% among participants ages 20 to 35 in both genders and 10% to

15% among those participants age 36 and older. No registered nurses participated in the study.

There were a few unanticipated outcomes and limitations to this project: (a) a shortened educational timeframe; (b) lack of permission to print the educational PowerPoint presentation; and (c) a smaller than expected sample size that limited statistical analysis of the findings. However, after the pretests/posttests and educational materials were completed, and during the evaluation of the evidence, remarkable changes began to take place within the institution. There were a total of eight Stage I PU cases within the facility before the classes; 1 week after the classes, that number had decreased to zero. The Stage II PU cases showed signs of rapid healing but no changes were noted with the instances of Stages III and IV PU. Additionally, no newly reported cases were noted. This was a significant finding because redness was reported on a daily basis.

Thus, the implications of the study clearly outlined the fact that on an individual basis, if nurses and care staff are trained adequately, their positive actions will impact each patient in regard to the prevention and treatment of PU. This will lead to a decrease in the incidences of PU development and prolongation within the institution. Thus, knowledge increased performance. Having a decrease in PU, the institution will ultimately decrease the amount of monies spent caring for this particular issue. In addition, the facility is a part of a system of hospitals run by the state, and when the findings are communicated, the evidence can be used among sister facilities, helping nurses to care for the issue within those facility as well. This study has already positively impacted social change within the DD population. The report of a decrease in the PU

cases and no additional cases within 1 week will serve as a catalyst showing care providers for this vulnerable population that they do not need to tolerate PU with their patients,.

Recommendations

The major recommendation based on the results of this project is that care staff must be adequately trained in PU identification, prevention, and treatment before they come in contact with the vulnerable DD population. Additionally, nursing staff should be given refresher courses frequently to present new evidence-based materials and supplement the knowledge they already possess. The nurse executive, who worked as an advisor for this project, has already indicated that she will be meeting with all nursing and care staff and requiring all staff to attend the educational component of the project.

This project will contribute greatly to existing evidence-based information dealing with PU and nursing education. It has highlighted the fact that nurses are not the only ones coming in contact with the DD population, and that other care staff are at a disadvantage and may actually cause harm to patients if they do not receive adequate instructions. According to Orem's theory, self-care is an important component of every one's life. Those who cannot perform self-care must still benefit from someone performing that activity. These individuals rely on the care, expertise, and empathy of their caregivers.

Contribution of Doctoral Project Team

When the project team met for the final analysis of the study, it was agreed unanimously that the project was a tremendous success. The success was due partially to

the cohesiveness of the team, the team spirit, and the ability to work together effectively. Additionally, all members of the team had a stake in the outcome, which was to find a solution the PU problem within the facility. The nurse executive used her position to encourage participation, and the nurse educator was very instrumental in grading the papers. The preceptor, who also served as my clinical practicum advisor, helped with implementing the project, correcting papers, and analyzing the information. The team collectively decided that the findings should be presented at the next executive meeting, which involves all the management team for the facility.

Owing to the fact that the study was conducted within a state-run institution, the findings are relevant to all sister institutions. Therefore, the intention is to present the findings to the regional board in Atlanta, Georgia. It is hoped that the results of this project will help the state officials readjust their hiring practice of care staff, ensuring that they are adequately trained. Regrettably, there are no current plans to extend this project beyond this doctoral project.

Strength and Limitations of Project

The strength of this project was the fact that the organizers and presenters were all advance practice nurses who were committed to evidence-based health care. The limitation was the timeframe it took to present the materials and the smaller than anticipated number of participants in the project. The project would have been more effective if all the nurses within the facility had participated. However, the results of the pretest to posttest knowledge was a strong indication that educating staff is not only beneficial, but essential.

Recommendations for future projects are to have more time built in for the implementation aspect of the project. Another important issue would be to try to recruit more participants. This way the statistical analysis would carry more weight.

Section 5: Dissemination Plan

The findings are relevant to nursing practice and contribute to the patient population at the institution. The project highlighted the fact that training direct care staff resulted in a decrease in PU incidence within 1 week of the project's implementation. The nurse executive indicated that she would be requiring the nurse educator to perform quarterly PU training exercises utilizing the educational materials used for the project.

Based on the nature of this project, the audience that would best benefit from this project would be nurses in nursing homes and DD facilities. Regrettably, these facilities usually hire LPNs who do not have the educational background of an RN and may lack some clinical skills and judgment. The necessary skills to properly assess and treat the DD population with PU were highlighted in the educational component of the project.

Analysis of Self

I have seen a positive growth in various facets of my personal and professional experience. Having the patience to deal with the delay of the implementation phase was a lesson in perseverance and self-advocacy. In the role as a practitioner, scholar, and project manager I honed many skills. Interpersonal skills were developed when dealing with members of the interdisciplinary group. These members ranged from staff in management positions to untrained health care technicians. While the communication methods were different for each group, I learned how to treat each member with respect and dignity. I saw myself mastering all of the ANCC nursing Essentials during the process (AACN, 2006). My leadership skills were tested and developed even more while

performing as the project manager. Seeing the project come to fruition and knowing I was instrumental in that endeavor was an elating experience.

Drawing from this project experience, I plan to use the lessons learned to confront issues that I currently face and ones I am sure will surface during the course of my work. I have already identified several issues that I plan to address. The trajectory that I set for myself is to deal with one issue within the next 6 months, another within 1 year, and one long term. I am confident that this project has paved the way for continued success in my career.

Now that the DNP study is completed, I can retrospectively say that one challenge I faced was getting the DNP proposal approved. I had to exercise patience and respect during the initial process but was persistent in advocating for myself and my project. Having to change committee chair did set my project back, but in the end, the change was well worth it. The insight that I gained is to persist and keep the goal in sight, not allowing any individual or situation prevent me from achieving my goals.

Summary

The DD population is unable to communicate their needs; therefore, they are dependent on caregivers for all aspects of their care. This places them at risk for different ailments including PU. This project has demonstrated that educating nurses and care givers on PU prevention and treatment is possible. When immediate care givers are given the appropriate knowledge, PU can and will be forestalled. Finally, it was established that knowledge increases performance.

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Appendix A: Pressure Ulcer Questionnaire

Provider: _____ Total Number of Employees: _____

Title/Position: _____ Date: _____

Pressure Ulcer Knowledge Questionnaire

Circle the BEST answer:

1) Which statement(s) are true about pressure ulcers:
   a. They are localized areas of tissue damage
   b. They tend to occur at bony sites
   c. They are caused by prolonged pressure
   d. The patient/resident's nutrition status affects the development of a pressure ulcer
   e. All of the above
2) Which sites are the most susceptible to pressure ulcer development
   a. Sacrum and heels
   b. Temporal (side)area of the head
   c. Soft tissue areas
   d. Abdominal area
   e. All of the above
3) Which of the following patients/residents would be considered most "at risk" to develop a pressure ulcer
   a. A healthy, active 22-year-old new mother
   b. A 28-year-old patient in a leg traction
   c. An immobile 65-year-old patient who has had a stroke
   d. A physically active 80-year-old nursing home resident
   e. None of the above

Provider: _____

Title/Position: _____ Date: _____

4) To prevent pressure ulcers from developing, which of the following steps should NOT be taken?
   a. Routinely observe high-risk bony skin areas
   b. Turn patient/residents only upon their request
   c. Minimize pressure
   d. Keep the skin dry and clean
   e. Depending on the patient/resident's condition, encourage physical activity and a balanced diet

5) In a home health care agency, who should be actively involved in the reduction of a patient/resident's pressure ulcer?
   a. Physician/ Nurse
   b. Home health/hospice aides
   c. Family members
   d. Dietitian/ therapist
   e. All of the above

6) A resident/patient is at risk for pressure ulcers when they are or have:
   a. Bed or chair bound (immobility)
   b. Poor nutritional status
   c. Moisture from urine and feces or wound drainage
   d. Sensory impairment (such as stroke or dementia)
   e. All of the above

7) A pressure ulcer can form in:
   a. Less than 2 hours
   b. 24 hours
   c. 3 days
   d. 1 week
   e. 2 weeks

Provider: _____

Title/Position: _____ Date: _____

8) Residents/patients are assessed for risk of pressure ulcers:

   a. On admission, and then routinely
   b. When there is a change in condition
   c. When we remember
   d. When the physician orders it
   e. a and b

9) According to best guidelines, residents and patients who are at risk of developing a pressure ulcer should be evaluated for which of the following:

   a. Minimizing pressure by repositioning every 2 hours
   b. Use of pressure reduction surfaces
   c. Nutritional status
   d. Incontinence
   e. All of the above

10) Which of the following repositioning techniques are key in preventing pressure:

   a. Turning residents/patients at least every two hours while in bed
   b. Repositioning residents/patients confined to a chair at least hourly
   c. Floating heels
   d. Padding between bony areas
   e. All of the above

WE WILL PREVENT PRESSURE ULCERS. KNOW THE FACTS. TAKE ACTION.

Pressure Ulcer Knowledge Questionnaire

Provider: _____

Title/Position: _____ Date: _____

Please circle "True" if you think the statement is true and "False" if you think the statement is false.

11) Over two million people develop pressure ulcers a year in the US	True	False
12) A pressure ulcer can lead to death	True	False
13) Donut devices or ring cushions help to prevent pressure ulcers	True	False
14) Obese patients/residents are rarely malnourished and therefore at lower risk of developing pressure ulcers	True	False
15) A daily bath or sponge bath will prevent pressure ulcers	True	False
16) Friction or shear may occur when sliding a person up in bed	True	False
17) A blister on a resident's/patient's heel is not a concern	True	False
18) Erythema or redness on any resident/patient that is nonblanchable should be documented/reported	True	False
19) Bony prominences (areas) should not have direct contact with one another	True	False
20) Massaging a bony prominence (area) promotes circulation and prevents pressure ulcers	True	False

Appendix B: Educational Timeline

ID	Task Name	Start	Finish	Duration	% Complete	2016 July
1	Form committee	7/12/16	6/12/16	1 days	100%	
4	Education – administer pre/post test	7/13/16	7/15/16	2 days	100%	
7	Data analysis & reporting	7/16/16	7/17/16	2 days	100%	

Appendix C: Results & Findings

Sex	Job Description	Number	Age	Pretest Mean Average	Posttest Mean Average
Male	LPN	3	20-35	65%	100%
		4	36-51	55%	100%
		3	52+	45%	100%
Female	LPN	3	20-35	65%	100%
		3	36-51	50%	100%
		3	52+	35%	100%
Male	HST	3	30-35	30%	100%
		3	36-51	20%	100%
		3	52+	10%	100%
Female	HST	3	20-35	35%	100%
		3	36-51	15%	100%
		3	52+	10%	100%