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The Impact of Self-Care Education on Heart Failure Patients with a High Risk for Readmission

by

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in partial fulfillment of the requirements for the degree of
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Approval Page

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Abstract

The purpose of this Capstone Project study was to answer the question: Does self-care education improve knowledge and decrease 30 day readmission rates in a class of heart failure patients that are at high risk for exacerbation? The study used a randomized control design with a pre-test/post-test. A convenience sample of 50 African Americans diagnosed with heart failure were entered; control group (n=25) and experimental group (n=25). Both groups received the Heart failure Pre/Post Test developed by the researcher during the initial interview and four weeks post discharge. The experimental group received a phone call weekly over the four weeks with self-care education aimed at self-care activities that are evidenced based to improve or support heart failure conditions. The data was analyzed for descriptive statistics and correlation statistics using chi-square test or Fisher's exact test, and Wilcoxon rank sum test. Results indicated the intervention of self-care educational phone calls was successful with improving knowledge in the class of heart failure patients that are at high risk for exacerbation, while the readmission rates were not statistically significant.

Keywords: heart failure, heart disease, race disparity, Dorothy Orem, self-care, self-management, self-care education, self-care interventions, education interventions, heart failure education, African American health, African American with heart failure, self-care deficit, and heart failure with cultural implications.

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CHAPTER I

Introduction

Good health is a state of well-being and harmony, physically, mentally, and socially. Throughout an individual's life span good health can be challenged by factors such as genetics, environmental conditions, and cultural practices that disrupt this state of well-being, introducing disease and illness. Acute and chronic illnesses are examples of disease processes that alter physical harmony throughout the body. Heart failure (HF) is a chronic illness in which the hearts ejection fraction is compromised which decreases the ability to pump blood throughout the body. It may result from any structural or functional cardiac disorder and be influenced by comorbidities such as hypertension, renal disease, myocardial infarction, and diabetes. The heart's inability to work efficiently causes decreased perfusion and gas exchange to vital tissues decreasing their functionality. This phenomenon is debilitating to the body processes and has a high mortality and morbidity rate (While & Kiek, 2009).

Approximately 5.7 million people in the United States are diagnosed with HF and have a death rate of about 300,000 people per year (Graves, 2010). This is a major challenge to the health care system in the United States and globally as well. In the United Kingdom it is estimated that 350,000 men and 300,000 women at the age of 45 and older will be living with HF (While & Kiek, 2009). With this in mind, treatment plans that encompass quality of care, innovative self-care, and deliberate education must consider the most cost effective approach that preserves the quality of life and prevents financial strain on the health care system.

Problem Statement

According to Emory Healthcare (2014), 550,000 new HF cases are diagnosed in the United States yearly. Heart failure affects all ages, is responsible for 11 million physician visits a year, and has more hospital visits than all forms of cancer combined. The large volume of cases new and old is a current challenge to the healthcare system. The approximate cost per year, including readmission rates, is over 20 billion dollars, making it the most expensive cardiovascular disease to manage (Konstam et al., 2011). According to Swiadek (2009) patients are being admitted with greater acuity and each time a patient is readmitted, resistance to current treatment models increase. This phenomenon is a vicious cycle that does not favor positive patient outcomes and quality of life. Chronic illnesses have strained financial reimbursements and placed a tremendous burden on the healthcare system (Cohen & Cesta, 2005).

Racial disparities among HF patients have been studied. African Americans have the highest incidence of HF per 1000 person-years than any other race in the United States at 4.6 followed by Hispanic Americans (3.5), Caucasian (2.4), and Chinese Americans (1.0) (Bahrami et al., 2008). This incidence is thought to be related to chronic comorbidities that are seen within the African American community. According to Hussey and Hardin (2005) studies have shown the comorbidities of hypertension, diabetes mellitus, and an increased body mass index (BMI) has a higher prevalence in the African American community than other races in the United States. These comorbidities which involve multiple organ systems have a high influence rate on the development of HF.

According to Cohn (2006) medical management of HF has become standard, yet the evidence formulated for medical management has been developed from large trials focusing on Caucasian males predominantly. The gaps in the studies may have a profound effect on the African American community. There is an increased need for studies to narrow the gap and address these racial disparities (Hughes & Granger, 2014).

The responsibility for managing the disease process involves the patient's ability to understand what HF is, the need to take the prescribed medication, exercise therapy, diet control, and how to identify signs and symptoms of exacerbation. Studies have shown the positive correlation between poor self-care habits and worsening HF conditions and admissions into the healthcare portal (Riegal et al., 2009). Self-care education has to be deliberate and a priority for healthcare professionals to ensure that the patients and support systems understand and are able to give return demonstrations of self-care disease management techniques. The end goal is to prevent decompensation and manage symptoms (Mooney & Brown, 2005).

Justification of Project

Heart failure is a growing public health problem with an enormous financial burden to the healthcare system. It is often associated with a progressive decline in health (Hughes & Granger, 2014). This decline in health strains the quality of life for each patient diagnosed with HF mentally, physically, and socially. It also places stress on the families or support systems involved with the day to day care of the patient. According to Emory Healthcare (2014), African Americans are 1.5 times more likely to have a new onset case of HF than Caucasians. This disparity is consistent with the current divide between racial lines. African Americans have a higher prevalence of HF at a rate of 4.6 per 1000 person-years compared to any other race in the United States (Okin, Kjeldsen, Dahlof, & Devereux, 2011). Patients with HF and their support systems are responsible for making the right choices, being informed, along with using the information correctly, and managing their own care. The data trends for death and readmission rates are cohesive with the fact that HF self-care is poor in the United States (Riegal et al., 2009).

The justification of the project involves intentional nurse led interventions to build rapport with patients suffering from HF through education to produce better self-care practices. The capstone project focuses on improving self-care management behaviors by deliberate reinforcement of education via phone contact with the emphasis on the ability to understand HF pathophysiology, the need to take the prescribed medication consistently, exercise therapy to strengthen stamina, diet alterations to inhibit exacerbations, and how to identify signs and symptoms of exacerbation. Cohen and Cesta (2005) explained that this type of management focuses on a problem and prevents institutionalization. Self-care education can empower an individual and place disease management in their possession. Empowerment of the HF patient can build confidence. This is a start of a rhythmic cascade that can stimulate the patient to engage their disease process armed with knowledge. This ultimately places the patient in forefront management of their disease process and produces ownership.

Purpose

The purpose of this Capstone Project study was to answer the question: Does self-care education improve knowledge and decrease 30 day readmission rates in a class of heart failure patients that are at high risk for exacerbation? Through an intentional weekly self-care educational phone call addressing the definition of heart failure, the need to take the prescribed medication, exercise, diet, and how to identify signs and symptoms of exacerbation, the investigator has strived to enhance the understanding of each participant and reduce 30 day readmission rates within this population.

Assumptions

The following assumptions were made regarding the use of self-care phone calls to educate the HF patients:

1. Self-care concepts are prudent to increase the quality of life for patients with HF.
2. Self-care education improves the quality of care received thereby improving outcomes.
3. The post test scores are expected to be higher than the pretest scores for the intervention group demonstrating an increase in understanding which empowers the patient.
4. The 30 day readmission rate will be lower for the intervention group that received the self-care phone calls compared to the control group with regular treatment.

Definitions

Terms are defined regarding their relation to this project for clarity below.

- Health deviation-structural, functional, or genetic defects from well-being (Orem, 2001).
- Heart Failure or HF- the inability of the heart to effectively pump blood throughout the body.

- 30 Day Readmission- the process of returning back to the healthcare portal for uncontrolled illness.
- Self-care- the ability of an individual to contribute to the maintenance of personal health including the activities of daily living.
- Self-care deficit- the inability of an individual to contribute to the maintenance of personal health including the activities of daily living.
- Self-care education- items to enhance learning to manage one’s own care.

Theoretical Framework

The theoretical framework chosen for this capstone project is the Self-Care Deficit Theory (SCDT) developed by Dorothea Orem. (Figure 1) This theory is framed around a partnership between the individuals that experience deficits in self-care and the nursing professions’ ability to intervene and meet the demand. The concept of this theory is based on learned behavior to meet a clear need which is divided into three groups for self-care; universal, developmental, and health deviation (Orem, 2001). The focus of this study involved health deviation self-care from this subgroup. Health deviation self-care attends to the needs of an individual during a time of illness or disease whether structural, functional, or genetic, that influences the ability to perform self-care (Orem, 2001). Patients with HF can experience a decline in self-care performance due to the disease process and the psychosocial as well as the physiological strain.

According to Orem (2001) nursing systems provide direct care or indirect care to compensate and support individuals with self-care deficits. Three types of nursing systems explained by Orem are wholly compensatory system for individuals who are totally dependent on nurses for self-care, partially compensatory system for individuals in which nurses partially assist in self-care and compensates for the deficit as needed, and supportive-educative system for individuals that can perform self-care and the nurse is there to educate to enhance and support self-care. This study encapsulates the supportive-educative system component of the nursing system. The intervention provided by this study engages the HF patient by weekly phone calls with an educational initiative involving self-care components for this population.

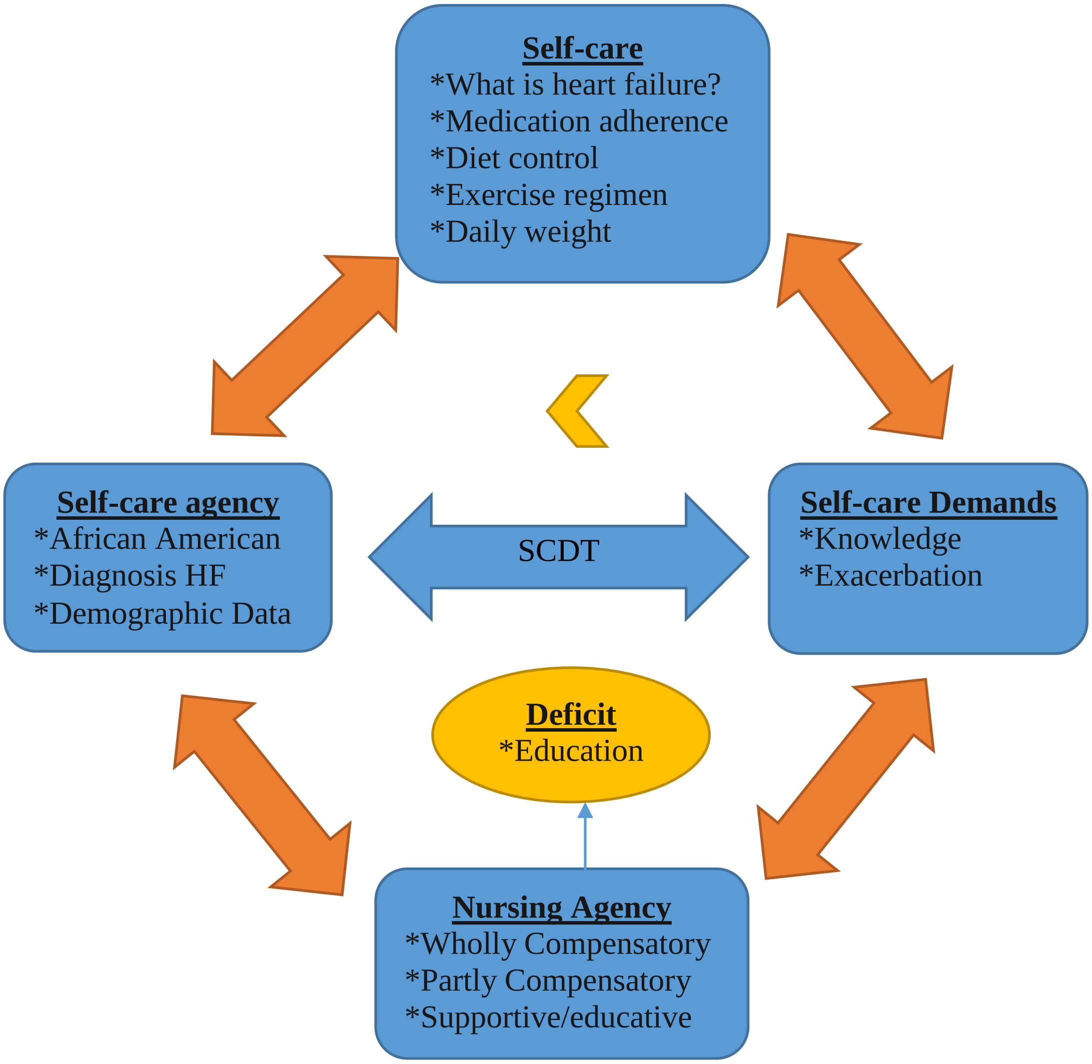

Figure 1. CTE Diagram of Orem's Theory of Self-Care Deficit Theory

Summary

Heart failure is a major health problem in the United States that is devastating to the quality of life and strains the healthcare system. The current data indicated that African American people in general, have the worst outcomes in managing this disease. Developing self-care educational initiatives has been found to have a positive effect and improve the quality of life. Nurse led interventions can have a positive effect on patients with HF. Nurses take an educated and holistic approach to care delivery and getting involved in all aspects of care (Cohen & Cesta, 2005). This concept encompasses learning, nursing theory, evidence based practice, and understanding the environment and culture. The interventions can empower the HF patient to develop better self-care practices that can result in an improved quality of life and decrease strain on the healthcare system by decreasing readmissions.

CHAPTER II

Research Based Evidence

A review of literature was conducted based on the capstone project “The Impact of Self Care Education on Heart Failure Patients with a High Risk for Readmission” with the intent to investigate if self-care education improves knowledge and decreases the 30 day readmission rates in a class of heart failure patients that are at high risk for exacerbation? This review of literature used a variety of data bases for searching key terms around this subject. The databases included Google Scholar, ProQuest, Medical Literature On-Line (Medline), Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Academic Search Premier. Key terms for the search included heart failure, heart disease, race disparity, Dorothy Orem, self-care, self-management, self-care education, self-care interventions, education interventions, heart failure education, African American health, African American with heart failure, self-care deficit, and heart failure with cultural implications.

Review of Literature

Self-Care Deficit Theory Application to Health Care

The focus of this capstone is to explore the Supportive-educative component of Orem’s nursing systems in the SCDNT. O’Shaughnessy (2014) described the implications of the SCDNT to the elderly patient on peritoneal dialysis. The change in life expectancy has increased in the United States due to health care advances. The author informed that in 2010 the number of adults over 65 was at 13% and is expected to rise to 16.1% by the year 2020. A literature review showed using peritoneal dialysis for the elderly promotes a sense of self-worth and an overall improved quality of life. The literature also has shown the elderly use proper procedures when administering peritoneal dialysis with similar peritonitis free survival rates like the younger patients. The use of Orem's theory is integral in teaching patients how to perform peritoneal dialysis in their own environment along with the follow up by a nurse either face to face or by phone. Orem's theory promotes the ownership along with improving quality.

Orem's theory was further used for research in a cross-sectional, survey design by Grubbs and Frank (2004). The study focused on self-care practices related to symptoms responses in African Americans and Hispanic Americans at risk for cardiovascular disease and diabetes mellitus. The sample size of 60 participants were recruited from faith based entities; 15 African American males, 15 African American females, 15 Hispanic American males, and 15 Hispanic females. The survey instrument used was a Symptoms Response scale with demographic questions. The results of the study showed potential self-care deficits with health deviations in seeking and securing medical assistance, awareness of the pathologic conditions, and medication knowledge. The implications of this study enforced that Orem's Self-Care theory is appropriate for this population. Supportive/educative nursing systems need to address the knowledge deficits pertaining to signs and symptoms of the disease process.

Marcuccilli, Casida, and Peters (2013) conducted a research study using Orem's Self-Care theory as the foundation of the study. The study explored how patients with a left-ventricular assist device (LVAD) adjusted their self-concept to accept this form of treatment and a sense of normalcy. LVADs are used in patients with severe HF waiting transplants or as a permanent part of life. This device circulates oxygenated blood from the left ventricle to the aortic arch. The device has a pouch that is visible to the public around the patient. The design was a hermeneutic phenomenology based on van Manen's method. There were nine recruits with an age range of 31- 70 who had the LVAD for three months. Data was collected by interviews. The self-care requisite that was used in this study was health-deviations or pathological and/or medical diagnostic or treatment procedures. This deals with the individual's self-concept in the midst of a physical alteration while being able to care for themselves, in this case the external component of the LVAD. The results indicated that the recruits accepted the LVAD as necessary to live making it easier for them to modify self-concept along with accepting the bodily changes and daily living. The implications of this study relative to this capstone project are the ability of the nursing profession to promote self-care education that impacts the quality life for each patient.

The effectiveness of the Self-Care theory was demonstrated in a study describing an educational intervention provided to a group of teenagers with asthma (Altay and Çavuşoğlu, 2013). Mortality from asthma in teenagers has doubled over the last 20 years compared to younger children. The purpose of the study was to determine the effects of nursing interventions based on Orem's Self-Care theory on teenagers with asthma. The study was randomized with 80 participants. The educational intervention was a home visit with the nurse teaching self-care skills that included medication usage, applying an asthma action plan, a daily follow up schedule, and trigger prevention. The experimental group received eight visits and the control group received two visits. The results showed improvement in self-care skills by the experimental group while the control group had no changes. The data was derived by the knowledge difference gained between the first and last visit for each group. The findings from the study demonstrated the effectiveness of Orem's Self-Care theory.

Heart Failure Exacerbation 30 Day Readmission

Readmissions for HF are a problem in the United States that this capstone project addresses in its purpose of an educational intervention. It is a vicious cycle that demonstrates the decreased quality of care and life. Gheorghiade, Vaduganathan, Fonarow, and Bonow (2013) described the problem that HF readmission imposes on quality and the healthcare system. The authors explained that heart failure has a high prevalence of 5.8 million in the United States with a high readmission rate that continues to rise annually. The authors stated that approximately one million hospitalizations occur per year due to HF and unplanned 30 day readmissions cost Medicare alone 17.5 billion dollars. HF readmission rates are used for a category in quality to emphasize the quality care of the health care entity provided and a basis for reimbursement. Government funding is in jeopardy every time there is a HF readmission within 30 days. Federal Government funding through the Center for Medicaid and Medicare Services (CMS) provides about 60% of reimbursement income for the participants to the healthcare providers. The authors discussed strategies that were implemented from several trials that were successful at decreasing readmission rates. These strategies were aimed at managing comorbidities such as diabetes and the increased use of evidence based therapies for disease management. The strategies included fluid management by sodium and fluid restriction post–discharge, increased monitoring of hypertension and diabetes with therapeutic medication management, and treating mechanical variances of the heart with electrical therapy and rate controlled medications (Gheorghiade et al., 2013).

In a research article by Joynt and Jha (2011) the most common cause of hospitalizations and readmission is HF at a rate of 1.4 million in-patients with a cost of 17 billion dollars in the year 2007 alone. This study examined the unintended consequences of current policies that penalize for readmissions on resource-poor institutions. There were 905,764 discharges entered in to the study who were Medicare patients diagnosed with heart failure in the year length of 2006 to 2007. The research performed used a multivariable model to compare readmission rates between patients discharged with and without cardiac services, patients discharged from public versus nonprofit hospitals, hospitals in counties with high median income versus low median income, patients discharged from small hospitals compared to large hospitals, and hospitals in the lowest quartile of nursing staff compared to the high quartile of nursing staff. The results from the study showed the correlation between hospitals with fewer resources performing the worst. The findings revealed that penalties on resource deprived hospitals need to be examined to make sure it does not worsen the gap in the quality of care for the patients. This notion creates a revolving door for the HF patients served in those areas. The limitations of this study did not account for the variations in severity of disease and only Medicare patients were entered.

Alspach (2014) described HF readmissions as similar to a revolving door and discussed the need to slow the revolving door. The cost for treating HF in 2013 was at 32 million dollars and projected to increase by 120% by the year 2030 to 70 billion. According to the author, despite modern improvements in HF care 30 day readmission rates are a staggering 24% of cases. These findings are essential for this capstone project, reinforcing the need for interventions to prevent exacerbations that lead to decrease quality of life and increased HF 30 readmissions to further burden the health care systems.

Finally, to support the capstone project stance on the significance of 30 day readmission for HF exacerbation, the government has invested in an incentive to improve outcomes. In a research study by Bradley et al., (2013) a cross-sectional study was performed using a web-based survey of different hospitals initiatives directed toward reducing readmissions for HF patients.. According to the authors, 20% of Medicare beneficiaries are readmitted within 30 days post discharge, and cumulatively the estimated cost for America is greater than 15 billion dollars per year. The Patient Protection Affordable Care Act of 2010 was signed into law and has created new incentives for hospitals to reduce readmission rates. Basically, if the organization has high readmission rates then it will be penalized by reduced reimbursements from Medicare. This study showed how different health care organizations have adjusted their practice to achieve this goal.

Heart Failure Educational Interventions

The best weapon to promote disease management is the understanding of the disease process and how to neutralize its effect through education. Self-care education has been shown to increase better outcomes and quality of life for patients with HF. This capstone project explored how education increases knowledge and can be used to reduce HF readmissions. Sales et al. (2013) discussed the readmission burden placed on the health care systems in their research study. The authors noted that annually one million people are hospitalized with a diagnosis of HF per year associated with a Medicare cost of 17 billion dollars. This randomized study explored how self-care education distributed by trained volunteer staff impacted the HF patient and the 30 day readmission rates. There were 173 participants, 18 and older with a mean age of 73 years. The participants were divided into group A, who received dietary education, medicine education, a follow up phone within 48 hours post discharge, and a call a week for a month and group B who received regular care. The results of the study showed a decrease in readmission rates of 63% and risk for exacerbation lower in the intervention group compared to the control group. This finding reinforced the need for self-care education delivery to the HF patient.

The next educational intervention study encompassed family participation. Dunbar et al. (2013) conducted a randomized study with 117 participants who were divided into three groups: the Usual Care Group, the Patient-Family Education group (PFE), and the Family Partnership Group (FPI). Participants in the Usual Care group received routine care given by the provider. The Patient-Family Education Group received an initial education session for the first month on fluid overload, sodium intake, medication adherence, symptoms of fluid overload, maintaining refills, physical activity, and daily weighing. The next session they received was at two months which included meal preparation, selection of low sodium foods, and adjusting to recipes. The last contact was by mail with a newsletter to reinforce what things were discussed in the previous two sessions. The Family Partnership Group received the same education as the PFE group but also had breakout session for families to ask questions. Both groups PFE and PFI received follow up phone calls as well. The authors created this study knowing that decreasing dietary sodium and following a medication regimen is difficult for the typical HF patients. This study lasted for eight months. Data was collected in intervals as the interventions were enforced. The data included urinary sodium levels. The results of the study showed a decrease in urinary sodium in the PFE and PFI groups at four months with no change in the UC group. Both PFE and PFI groups' increased HF knowledge post intervention but no group changed with medication adherence. The implications of this study enforced the need for self-care education not only with the patient but their support systems as well.

Boyde et al. (2013) denoted a major component of burden that HF inflicts is the recurrent hospitalizations and that one-third to a half of them can be prevented. The authors agreed that patient education is a key component to promote adhering to regimens that prevent exacerbations and is consistent with best practice. With this in mind, they conducted a study to answer the research question: "Do patients with HF demonstrate improved knowledge and increased self-care behaviors following participation in an educational intervention?" The study measured self-care maintenance, management, and confidence. This one group pretest/posttest designed study enlisted 38 participants with a confirmed diagnosis of HF. The study lasted eight weeks beginning with a pre-test questionnaire and a group session watching a DVD that modeled self-care activities consisting of the hospital experience, medicines, daily weighs, rest, food, exercise, and self-care. Copies of the DVD were given to each participant with instructions given to watch a session once a week until the week eight return appointment. At the return appointment the participants took the posttest questionnaire. The results of the study demonstrated a significant improvement in the pretest/posttest scores for knowledge ($p = 0.0001$), maintenance $p = 0.027$, management $p<0.0001$, and confidence $p = 0.051$. The implications of this study suggested that health care workers should use educational resources specifically designed to meet the need of each individual patient to enhance self-care behaviors that will ultimately improve quality of life and decrease exacerbations.

The importance of self-care education has been shown to be a global indicator for the HF patient success and quality of life in countries other than the United States. Kato et al. (2012) identified HF being a burden to their society and conducted a study in Japan that examined the impact newly developed evidence-based self-care education had on a group of HF patients. They realized that the self-care education had to be made at the comprehension level of the patient to promote adherence. The study recruited 22 hospitalized HF patients that were given a questionnaire to see what information was desired by them. The results yielded that the patients desired to know about HF signs and symptoms, things to notify the doctor, prognosis, and physical activity level. The authors took this response and developed self-care education material based on current HF guidelines. This information was given to nine hospitalized patients and taught to them by cardiac nurses followed by a questionnaire. The questionnaire was given to the same patients one month after discharge. To evaluate the degree of understanding, the authors ran the Wilcoxon Signed-Rank test on the before and after scores from the questionnaire. The results revealed that the understanding of HF symptoms, medication, weighing, sodium intake and fluid intake had improved. They concluded that the HF patient has a great need for information with the delivery catered to their level of understanding. This study reinforced the capstone projects quest to explore self-care education in relation to improved knowledge.

Another study focused on improving self-care education through video and written materials. Veroff et al. (2012) conducted a randomized controlled trial with 480 survey respondents (246 in the intervention group and 234 in the control group). The intervention group received basic program information, a HF fact sheet, a medical decision aid, a DVD, and booklet. The control group only received basic written materials. All patients took a survey after four weeks. The survey finding reported that the intervention group was more likely to monitor fluid intake, follow low sodium diets, and increase daily weight monitoring. The implications of this study are to use inexpensive behavior change interventions to improve self-care behaviors for HF patients. The core of this study is the implications of how self-care education can modify a behavior and produce a change in a HF patient's life that will facilitate better outcomes and reduced readmission rates.

Fredericks, Beanlands, Spalding, and Silva (2010) explored, in a research study, the most effective means of delivery of self-care education to the HF patient. This study performed a systemic review of 69 studies involving 1,865 participants. The main element of HF self-care education is to communicate the education in a way to ensure the individual has the appropriate knowledge to perform self-care management activities at home resulting in a reduction in the occurrences of HF exacerbations. Fine tuning the educator's efforts to convey the message would improve overall quality of life. The information gained from this study suggested that nurses could consider a design that emphasizes individualized interventions, use of media, and hold one-on-one sessions. The capstone project used the one-on-one concept for the intervention by using phone calls to discuss self-care education once a week for four weeks. Education is one of the most powerful health care interventions. It gives individuals the ability to own the management of their care.

Heart Failure and African Americans

The purpose of this capstone project study was to answer the question: Does self-care education improve knowledge and decrease 30 day readmission rates in a class of heart failure patients that are at high risk for exacerbation? The HF patients considered high risk for exacerbation in this study are African Americans. Sharma, Colvin-Adams, and Yancy (2014) discussed the high prevalence of HF in African Americans. The prevalence of existing HF in African Americans is 9.1 per 1,000 person-years compared to Caucasian Americans with a rate of 6 per 1,000 person-years (Sharma et al., 2014). New onset HF rate per year in the United States is 1.0 per 1,000 person-years in Chinese American, 2.4 in Caucasian Americans, 3.5 in Hispanic Americans, and 4.6 in African Americans. The authors also noted that despite 20 years of progress in treatment of HF in the United States, African Americans have a 45% greater risk of death or decrease in functional status when hospitalized than Caucasian Americans. The authors name common chronic conditions such as hypertension, diabetes, obesity, and chronic kidney disease that all predispose African Americans to developing HF. Other contributing factors are socioeconomic factors, genetic polymorphisms, endothelial dysfunction, and neurohormonal imbalances (Sharma et al., 2014).

Hussey and Hardin (2005) did a comparison of HF patients by characteristic between race and gender. They found that 3% of the African American population is affected by HF. African American men with HF had a 21.9% death rate compared to a rate of 19.4% in Caucasian men with HF. African American females with HF had a 19.4% death rate compared to a 18.2% death rate for Caucasian women with HF. The authors compared some risk factors that predispose patients for HF. They found that

African Americans develop hypertension at an earlier age relative to Caucasians, they have a higher body mass index (BMI), tend to smoke at a higher rate and have the highest prevalence of diabetes than any other race in America. These are the catalysts that make African Americans a high risk group when it comes to the HF patient.

Chen, Normand, Wang, and Krumholz (2011) did a study that tracked trends in HF hospitalization and mortality rates using data from Medicare beneficiaries for the years 1998 through 2008. They extracted data from acute care hospitals in the United States and Puerto Rico, searching for patients with a discharge diagnosis of HF. The data measured the change in incident rate ratio (IRR) from 1998 to 2008. The results showed a trend of decreased hospitalizations and mortality overall during this time period but noticeably African American men had the lowest rate of decline in all groups measured. The actual data set numbers were Caucasian males IRR = 0.73 and Caucasian females IRR = 0.72 compared to African American males IRR = 0.81 and African American females IRR = 0.76. This indicated that African American males and females continue to be hospitalized more and have a higher mortality rate.

A study was conducted to evaluate the relationship between ethnicity and HF incidence. The findings reinforced this capstone project prospective to African Americans being a high risk group for HF exacerbations. Bahrami et al. (2008) conducted a research study called Multi-Ethnic study of Atherosclerosis. It had 6,814 participants with a mixture by race: Caucasian, African American, Hispanic, and Chinese American. Baseline information was collected from the participants with a follow up interview by phone call every six to nine months for four years. The follow-up consisted of inquiring about hospital admissions, cardiac outpatient diagnoses, and deaths. Two physicians reviewed each record for follow up as well. The results revealed that African Americans had the highest incidence of HF than any other race represented at a rate of 3.1 per 1,000 person-years, followed by Hispanic at 3.5, Caucasian at 2.4, and Chinese American at 1.0. A point of interest from this study revealed according to Bahrami et al. (2008) the risk for higher incidence of HF in African American was related to the presence of diabetes, hypertension, and socioeconomic status. The significance gained is the presence of comorbidities to perpetuate the development of HF.

Kamath, Drazner, Wynne, Fonarow, and Yancy (2008) studied acute decompensated heart failure (ADHF) from the aspect of race related differences, patient experiences, treatment, and short-term mortality. This study compared African Americans and Caucasians (CA) in terms of demographics and mortality differences. The data was extracted from the ADHF data base from September 2001 to December 31, 2004. The one known factor pulled from this results noted that African Americans (AA) were diagnosed ADHF at a younger age the Caucasian Americans. Out of 130,734 episodes of ADHF the mean age for AA were 63.5 compared to CA with a mean age of 72.5 (Kamath et al., 2008). Developing this type of HF early in life can challenge the quality of life of these patients and increases the risk of readmission due to an exacerbation.

The final article used to demonstrate that African Americans with HF are in a high risk group for exacerbation is a study on self-care practices among low income African Americans. Woda, Belknap, Haglund, Sebern, and Lawrence (2014) noted that African Americans have the highest risk to develop HF and at a younger age than any other race in the United States. Hypertension, which is highly prevalent among African

Americans, is one of the major comorbidities in the development of HF. The authors discussed from previous investigators that chronic poverty and experiences with racism induces elevated cortisol levels that increase blood pressure and make it difficult to treat. This compounded with socioeconomic factors such as lack of insurance and money, along with finding it hard to maintain HF self-care activities, can add to the problem. The study had three groups with the total of 10 participants. The participants were recruited from three public housing buildings with low income (yearly average less than 13,537/year) and over the age of 55 with disabilities. The study used photovoice which used visual aids of what the participants perceived as a benefit or a problem. The participants related important lifestyle factors through photography. The investigator met with the participants two hours per week for six weeks. The data collected were the photographs and quotes from interviewing the participants. The data was analyzed by a process that consisted of data reduction (transcript readings to identify facilitators and challenges of engaging HF self-care), data display (placed in categories), and concluding (interpreting the data). The emerging theme was divided into four categories: Family support for a push, social interactions lifted them up, improving the mind improves the heart, and the complicated need to follow the HF diet. The implications of these results informed policy makers, health care workers, patients, and support systems the need to individualize assessments and interventions for each HF patient. This increased the engagement of self-care educational activities that will prevent exacerbations.

Gaps in Literature

Reviewing all the current literature, phone call interventions have been used in conjunction with other therapeutic measures such as audiovisual aids and written materials. The literature is limited when using just a phone call for self-care education only. The method of using self-care education phone calls on a consistent basis is limited as well. This capstone project emphasizes the sole use of the telephone to educate the participants.

Strengths and Limitations of Literature

The major strength found throughout the literature review is that self-care education is effective when it is individualized for each patient. Orem’s Self-Care Theory has been widely used as theoretical framework for many studies. The theory gives a basis with many avenues nurses can lead education initiatives whether written, electronic, or audiovisual. Involving family or whoever is the support system for the participant has shown great promise.

The limitations of the literature found that knowledge based interventional plans may increase knowledge but the participant confidence level to do self-care may not increase and the studies cannot account for a participant eagerness to learn (Boyde et al., 2013).

Summary

In summary of this chapter, the literature supported building this capstone project on Orem’s Self-Care Theory. Self-care is lacking in the United States. There is a large number of patients with HF with exacerbations that cause 30 day readmissions. HF has the highest readmission rate above all chronic health issues at present. African Americans in the United States have the highest incidence of HF along with the highest mortality rate.

CHAPTER III

Project Description

The name of this capstone project is The Impact of Self Care Education on Heart Failure Patients with a High Risk for Readmission. African Americans with HF are in the high risk category for 30 day readmissions due to the high prevalence of the disease and presence of comorbidities. The purpose of this capstone project study was to answer the question: Does self-care education improve knowledge and decrease 30 day readmission rates in a class of heart failure patients that are at high risk for exacerbation? The following chapter presents the project implementation, setting, sample, project design, and protection of human subjects, instruments, data collection, data analysis, timeline, budget, and limitations in this project.

Setting

The setting was a tertiary referral care center that provides acute, intermediate, rehabilitation, and outpatient health services. The center is located in Eastern North Carolina and serves more than 1.4 million people in 29 counties. It is an academic teaching site for medical students and residents, nurses, nurse practitioners, physician assistants, and other health professionals. There are many service lines which include cardiac, medicine, surgery, trauma, transplant, pediatrics, women’s health, behavioral health, rehab, stroke, and cancer care.

The project was conducted within the facility through the Heart Failure Program. The program governs an outpatient clinic and patients that have been admitted within the facility with a diagnosis of heart failure. Patients are seen daily in the clinic by a nurse practitioner or a physician for follow up care. The program has clinic nurses, nursing assistant, a secretary, and a clinical social worker to assess for the needs and make referrals for community resources.

Sample

A convenience sample of 50 patients participating in the Heart Failure Program was recruited to participate in this study. The inclusion criteria for the population involved in this research project were African American males and females with a minimum age of 25 years old and who have a diagnosis of heart failure with a reduced or preserved ejection fraction study. The participants were required to speak English, be able to read at a fourth grade level, be willing to participate, sign informed consent (Appendix A) and have access to a phone for follow up calls. If the candidate was blind or unable to write due to physical limitations, the candidate was required to have a representative to act on his/her behalf.

The sample was equally divided into an experimental group of 25 participants (receiving the intervention) and control group of 25 participants (not exposed to the intervention). Each participant was randomly selected to receive the intervention. Starting with the first participant, identified by the number one, in sequence to every other odd participant received the intervention. Each participant must fall within the inclusion parameters to be viable for this study.

Project Design and Implementation

The study used an experimental research design approach with randomization of the experimental group and a pre-test-post-test. The control and experimental groups each received the Heart failure Pre/Post Test (Appendix B) developed by the researcher, aimed at self-care activities that are evidenced based to improve or support heart failure conditions. The demographic tool (Appendix C) for basic data was developed by the researcher. The data analyses, descriptive statistics, and correlation statistics were used to evaluate the results of the data.

Planning

Once the IRBs from the University and the healthcare facility were approved, contact with the Heart Failure Program director was established to examine the process of patient recruitment, access to electronic health records (EHR), establish rapport with all the team members, and overall monitoring of the project. The HF program has an active list on all patients that are currently participating in the program. The active list is vital to the capstone project for the purpose of recruitment. The list contained demographic data that was used to initially screen for potential candidates within the set inclusion criteria for the Capstone project.

Implementation

The principle investigator used the HF Program Active list to screen for potential candidates who fit the set criteria on a weekly basis. The potential candidates that fit the inclusion criteria were selected and approached with an invitation to participate in the capstone project. These candidates were participants in the HF Program and were inpatient in the healthcare facility. The candidates were given a thorough explanation of the capstone project with an open invitation to participate and informed of the right not to participate. Upon acceptance the candidates were transformed to a participant and signed consents for the study. The original consent was saved for the file and a copy was given to each participant.

The initial interview. The participants were interviewed to gain demographic data, to be pre tested, and to establish a reliable way for the follow up phone call. The data was collected by verbal interview for each participant and electronically stored on the demographics form. All participants received the Heart Failure Pre/ Post Test instrument designed by the principle investigator. The pretest questions were read by the principle investigator and the participants' answers were logged in electronically. The pretest was scored and entered on the data collection excel spread sheet (Appendix D). The same method was done for the post test except this session was held via phone communication. The principle investigator did not help the participants answer any of the questions to ensure the elimination of bias and preserve the data from being skewed. It was explained to the participants the need to have phone access with a backup phone number or designated contact if participant cannot be reached.

Randomization. The participants were assigned a number ranging from 1 – 50 for identification. The consent had the signature and was placed in the participants file. When called, the investigator used the consent to address each participant. All the files were locked and secured in the investigator's office preservation of their privacy aligned with the Health Insurance Portability and Accountability Act Health. Each participant was randomly selected to receive the intervention. The group of 50 participants was divided to form a control group of 25 members and an experimental group of 25 members. Starting with the first participant, identified by the number one, in sequence to every other odd participant received the intervention.

Experimental group. The 25 members of the experimental group received an intervention phone call session once a week for four weeks following discharge from inpatient status. No written information about HF was given to take home. This helped to track the time for 30 day readmission potential. The follow up phone calls consisted of self-care education for heart failure taken from the Heart Failure Pre/Post Test Instrument broken down into sections: Week one- understanding heart failure (defining heart failure, common types of heart failure, causes, and signs and symptoms of exacerbations), week two- self-care management (daily weights, how to use a scale, and implications of weight gain), week three- medication usage (importance of taking), and week four- understanding exercise and diet for heart failure patients (sodium sparing, avoiding alcohol, and reading nutrition labels). The final follow up phone call was made after 30 days from inpatient discharge. This final interview consisted of the primary investigator administering the Heart Failure Pre/Post Test instrument and asking the participant if there was a hospital admission during the last 30 days.

Control group. The 25 member control group did not receive any interventions. The follow up call was completed after 30 days from inpatient discharge. This final interview consisted of the primary investigator administering the Heart Failure Pre/Post Test instrument and asking the participant if there was a hospital admission during the last 30 days. After the post test was complete and scores logged in, the primary investigator offered the education that was given to the experimental group.

Protection of Human Subjects

The permission to conduct the Capstone Project was obtained from the University Institutional Review Board in conjunction with permission obtained from the healthcare facility. This project was deemed exempt due to minimal risk to participants by both entities. All participation was voluntary. Each participant completed a consent form prior to the initiation the study. Each participant was given a copy of the completed consent form for their own records. Participants were protected by replacing the names of each individual with a number on all exposed documents. The 50 participants were identified as a number 1 through 50. Due to the nature of the intervention, the researcher had access to participants' phone numbers. This data along with all additional data was stored in the researcher's office in a locked file cabinet. All electronic data was stored on an encrypted password protected flash drive and was stored in the researchers locked file cabinet after each use.

Instrument

The control and intervention groups received the Heart Failure Pre/Post Test developed by the researcher, aimed at self-care activities that are evidenced based to improve or support heart failure conditions. The Heart Failure Pre/Post Test instrument was designed with answers that were multiple choice and true/false. This design was used to eliminate biases on interpreting subjective answers.

Data Collection

The data collection for this capstone project was completed in three phases: Pre-intervention, post-intervention, and statistical analysis. During the pre-intervention phase the candidates consented to participate, made aware that this study will not interfere with the regular treatment by their physician, and made aware that participation was totally voluntary. The Heart Failure Pre/Post Test Instrument score was collected and demographics form was used by the principle investigator to obtain the following data: name, phone number, age range, marital status, and education level. This data was collected from the participant in a one-on-one interview.

The post-intervention data was collected from the participants after 30 days from inpatient discharge. The information was collected by phone interview. The data obtained was the Heart Failure Pre/Post Test Instrument score and notification of the readmission status for the participant. All this data was entered on Study Data Collection Form and prepared for the final phase; the statistical analysis. The SAS® Enterprise Guide® 6.1 was used for all analyses of the data collected.

Data Analysis

The data collected was entered in a personal computer utilizing a Microsoft Excel spreadsheet. The SAS® Enterprise Guide® 6.1 was used for all analyses of the data collected. Descriptive statistics were calculated for all variables. The experimental and control groups were compared on gender and marital status using the chi-square test or Fisher's Exact Test, and on age range and education level using the Wilcoxon Rank Sum (WRS) test.

The 30-day readmission rate was compared between the intervention and control groups using the chi-square test. Finally, the change between pretest and posttest score was compared between the intervention and control groups using the WRS test. The pretest score was subtracted from the posttest score of each individual to find improvements or deficits. The scores for each group (experimental and control were averaged). The WRS test was used because the data were not normally distributed. A p-value of 0.05 was considered statistically significant.

Timeline

The timeline for the data collection for the capstone project was configured post University IRB approval. The time for recruiting participants occurred late November

2014 through the end early February 2015. The post 30 day follow up ended early March 2015. Data analysis and translation began immediately after the post 30 day follow up.

Limitations

Recruiting participants for this Capstone project was modified by the principle investigator. Initially the thought was to recruit from the actual HF clinic. Recruiting from the clinic would have skewed the 30 readmission data. The clinic is a follow up service of the Heart Failure program. The participant's first appointments usually occur one to two weeks after inpatient discharge. This project's interventions needed to start as soon as discharge has taken place. With that in mind, the recruitment's focus was altered to aim at the inpatient side of the Heart Failure Program.

Summary

This experimental research designed study with randomization and a pretest/posttest comparison format was used to determine the effectiveness of HF self-care education on a population of patients that are at high risk for exacerbations and 30 day readmissions into the health care portal. The sample total consisted of 50 African American participants with random selection to divide the group in to two groups: 25 experimental and 25 control. A synopsis of the study design, ethical considerations, and instruments has been discussed.

CHAPTER IV

Results

The purpose of this Capstone Project study was to answer the question: Does self-care education improve knowledge and decrease 30 day readmission rates in a class of heart failure patients that are at high risk for exacerbation? The following chapter presents the results of statistical analysis for these questions.

Sample Characteristics

The population for this study were African Americans with an inclusion criteria for a minimum age of 25 years old, have a diagnosis of heart failure with reduced or preserved ejection fraction study, speak English, able to read at a fourth grade level, and willing to participate. Out of a possible 69 candidates only 50 qualified for this study: Control (n=25) and experimental group (n=25). The readmission rate has 48 total for calculation due to death of two of the participants. Below are tables 1 through 6 with descriptive statistic of all participants comparing age, gender, marital status, education level, interventions, and 30 day readmissions. All calculations were inputted in SAS® Enterprise Guide® 6.1.

Table 1

Description of Participants by Age

Age Range	Frequency	Percent	Cumulative Frequency	Cumulative Percent
25-30	1	2.00	1	2.00
31-35	1	2.00	2	4.00
36-40	3	6.00	5	10.00
46-50	5	10.00	10	20.00
51-55	9	18.00	19	38.00
56-60	4	8.00	23	46.00
61-65	12	24.00	35	70.00
>65	15	30.00	50	100.00

Table 2

Description of Participants by Gender

Gender	Frequency	Percent	Cumulative Frequency	Cumulative Percent
M	39	78.00	39	78.00
F	11	22.00	50	100.00

Table 3

Description of Participants by Marital Status

Marital Status	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Single	10	20.00	10	20.00
Married	23	46.00	33	66.00
Separated	4	8.00	37	74.00
Divorced	9	18.00	46	92.00
Widowed	4	8.00	50	100.00

Table 4

Description of Participants by Education Level

Education Level	Frequency	Percent	Cumulative Frequency	Cumulative Percent
8th gr	7	14.00	7	14.00
9th gr	1	2.00	8	16.00
10th gr	1	2.00	9	18.00
11th gr	8	16.00	17	34.00
HS grad	22	44.00	39	78.00
GED	1	2.00	40	80.00
College grad	3	6.00	43	86.00
Some college	7	14.00	50	100.00

Table 5

Description of Participants by Intervention Status

Intervention	Frequency	Percent	Cumulative Frequency	Cumulative Percent
yes	25	50.00	25	50.00
no	25	50.00	50	100.00

Table 6

Description of Participants by Readmission Status

(Frequency missing 2 due to death)

Readmit 30d	Frequency	Percent	Cumulative Frequency	Cumulative Percent
yes	12	25.00	12	25.00
no	36	75.00	48	100.00

Major Findings

The intervention and control groups were compared on gender and marital status using the chi-square test or Fisher's Exact Test, and on age range and education level using the Wilcoxon Rank Sum (WRS) test. For detailed results comparing demographic variables see tables 7 through 14 below. All four p-values were >0.05, indicating that the intervention and control groups were not significantly different on these variables. This finding enforced that randomization was pure.

Table 7

Gender by Intervention

Gender Frequency Percent Row Pct Col Pct	Intervention yes	 no	 Total
M	19 38.00 48.72 76.00	20 40.00 51.28 80.00	39 78.00
F	6 12.00 54.55 24.00	5 10.00 45.45 20.00	11 22.00
Total	25 50.00	25 50.00	50 100.00

Table 8

Statistics for Table of Gender by Intervention

Statistic	DF	Value	Prob
Chi-Square	1	0.1166	0.7328
Likelihood Ratio Chi-Square	1	0.1167	0.7327
Continuity Adj. Chi-Square	1	0.0000	1.0000
Mantel-Haenszel Chi-Square	1	0.1142	0.7354
Phi Coefficient		-0.0483	
Contingency Coefficient		0.0482	
Cramer's V		-0.0483	

Table 9

Marital Status by Intervention

Marital Status	Intervention		
Frequency Percent Row Pct Col Pct	yes	no	Total
Single	5	5	10
	10.00	10.00	20.00
	50.00	50.00	
	20.00	20.00	
Married	11	12	23
	22.00	24.00	46.00
	47.83	52.17	
	44.00	48.00	
Separated	3	1	4
	6.00	2.00	8.00
	75.00	25.00	
	12.00	4.00	
Divorced	4	5	9
	8.00	10.00	18.00
	44.44	55.56	
	16.00	20.00	
Widowed	2	2	4
	4.00	4.00	8.00
	50.00	50.00	
	8.00	8.00	
Total	25	25	50
	50.00	50.00	100.00

Table 10

Statistics for Table of Marital Status by Intervention

Fisher's Exact Test	
Table Probability (P)	0.0082
Pr <= P	0.9379

Table 11

Table Education Level by Intervention

Education Level	Intervention		
Frequency Percent Row Pct Col Pct	yes	no	Total
8th gr	3	4	7
	6.00	8.00	14.00
	42.86	57.14	
	12.00	16.00	
9th gr	1	0	1
	2.00	0.00	2.00
	100.00	0.00	
	4.00	0.00	
10th gr	1	0	1
	2.00	0.00	2.00
	100.00	0.00	
	4.00	0.00	
11th gr	4	4	8
	8.00	8.00	16.00
	50.00	50.00	
	16.00	16.00	
HS grad	11	11	22
	22.00	22.00	44.00
	50.00	50.00	
	44.00	44.00	
GED	0	1	1
	0.00	2.00	2.00
	0.00	100.00	
	0.00	4.00	
College grad	2	1	3
	4.00	2.00	6.00
	66.67	33.33	
	8.00	4.00	
Some College	3	4	7
	6.00	8.00	14.00
	42.86	57.14	
	12.00	16.00	
Total	25	25	50
	50.00	50.00	100.00

Table 12

Statistics for Table Education Level by Intervention

Wilcoxon Two-Sample Test	
Statistic	621.5000
Normal Approximation	
Z	-0.3161
One-Sided Pr < Z	0.3760
Two-Sided Pr > |Z|	0.7519
t Approximation	
One-Sided Pr < Z	0.3766
Two-Sided Pr > |Z|	0.7533
Z includes a continuity correction of 0.5.	

Table 13

Table for Age Range by Intervention

Age Range	Intervention		
Frequency Percent Row Pct Col Pct	yes	no	Total
25-30	1	0	1
	2.00	0.00	2.00
	100.00	0.00	
	4.00	0.00	
31-35	0	1	1
	0.00	2.00	2.00
	0.00	100.00	
	0.00	4.00	
36-40	1	2	3
	2.00	4.00	6.00
	33.33	66.67	
	4.00	8.00	
46-50	3	2	5
	6.00	4.00	10.00
	60.00	40.00	
	12.00	8.00	
51-55	6	3	9
	12.00	6.00	18.00
	66.67	33.33	
	24.00	12.00	
56-60	3	1	4
	6.00	2.00	8.00
	75.00	25.00	
	12.00	4.00	
61-65	5	7	12
	10.00	14.00	24.00
	41.67	58.33	
	20.00	28.00	
>65	6	9	15
	12.00	18.00	30.00
	40.00	60.00	
	24.00	36.00	
Total	25	25	50
	50.00	50.00	100.00

Table 14

Statistics for Table for Age Range by Intervention

Wilcoxon Two-Sample Test	
Statistic	589.0000
Normal Approximation	
Z	-0.9545
One-Sided Pr < Z	0.1699
Two-Sided Pr > |Z|	0.3398
t Approximation	
One-Sided Pr < Z	0.1722
Two-Sided Pr > |Z|	0.3445
Z includes a continuity correction of 0.5.	

Research Question: Improve Knowledge

Does self-care education improve knowledge and decrease 30 day readmission rates in a class of heart failure patients that are at high risk for exacerbation? The increase in score from pre to post was significantly higher in the intervention group (mean = 10.0, s.d. = 6.7) than in the control group (mean = 2.8, s.d. = 4.8) (p = 0.0001, WRS test). This study indicated that the intervention of self-care educational phone calls was successful with improving knowledge in the class of heart failure patients that are at high risk for exacerbation. (Table 15 & 16)

Table 15

Pretest, posttest, and difference score by intervention status

Intervention	N Obs	Variable	N	Mean	Median	Std Dev	Minimum	Maximum
Yes	25	Pretest score	25	87.12	87.00	8.47	68.00	100.00
		Posttest Score	22	96.86	100.00	4.05	87.00	100.00
		post minus pre	22	10.00	12.00	6.74	0.00	25.00
No	25	Pretest score	25	86.56	87.00	5.55	75.00	100.00
		Posttest Score	24	89.58	90.00	5.44	81.00	100.00
		post minus pre	24	2.79	0.00	4.76	0.00	13.00

Table 16

Statistics for pretest, posttest, and difference score by intervention status

Wilcoxon Two-Sample Test	
Statistic	682.5000
Normal Approximation	
Z	3.8295
One-Sided Pr > Z	<.0001
Two-Sided Pr > |Z|	0.0001
t Approximation	
One-Sided Pr > Z	0.0002
Two-Sided Pr > |Z|	0.0004
Z includes a continuity correction of 0.5.	

Research Question: Decrease 30 Day Readmission Rates

Does self-care education improve knowledge and decrease 30 day readmission rates in a class of heart failure patients that are at high risk for exacerbation? The intervention group had a lower readmission rate (4/23 = 17.4%) than that of the control group (8/25 = 32.0%), but the difference in rates was not statistically significant (p=0.2429, chi-square test). This study indicated that the intervention of self-care educational phone calls did not significantly impact the 30 day readmission rate.

Table 17

Readmit 30 Day by Intervention

Readmit 30d	Intervention		
Frequency Percent Row Pct Col Pct	yes	no	Total
yes	4 8.33 33.33 17.39	8 16.67 66.67 32.00	12 25.00
no	19 39.58 52.78 82.61	17 35.42 47.22 68.00	36 75.00
Total	23 47.92	25 52.08	48 100.00

Frequency Missing = 2

Table 18

Statistics for Readmit 30 Day by Intervention

Statistic	DF	Value	Prob
Chi-Square	1	1.3635	0.2429
Likelihood Ratio Chi-Square	1	1.3870	0.2389
Continuity Adj. Chi-Square	1	0.6957	0.4042
Mantel-Haenszel Chi-Square	1	1.3351	0.2479
Phi Coefficient		-0.1685	
Contingency Coefficient		0.1662	
Cramer's V		-0.1685	

Summary

This study aimed to answer the questions does self-care education improve knowledge and decrease 30 day readmission rates in a class of heart failure patients that are at high risk for exacerbation? The information was presented reinforcing a pure randomized sample with the variables gender by intervention, marital status by intervention, education level by intervention, and age range by intervention all had p-values >0.05. The information demonstrated the significance of the educational intervention to improve knowledge with a $p = 0.0001$ generated by the Wilcox-Two Sample Test. Finally, the information demonstrated the educational intervention not statistically significant for 30 day readmission rates with a $p=0.2429$ generated by the chi-square test.

CHAPTER V

Discussion

This study aimed to answer the question does self-care education improve knowledge and decrease 30 day readmission rates in a class of heart failure patients that are at high risk for exacerbation? This chapter presented the implication of the findings and how to move forward with these concepts in the nursing profession.

Implication of Findings

The implications of these finding generated responses from two domains; first, the knowledge gained was demonstrated by a significant increase in scores from the pre to post test in the intervention group (p = 0.0001, WRS test). This study indicated that the intervention of self-care educational phone calls was successful with improving knowledge in the class of heart failure patients that are at high risk for exacerbation. Compared with current literature the same results from similar studies have been obtained. The ability to give information in various ways tailored to the patients understanding helps build the patients knowledge base.

Secondly, the readmission rate for the intervention group was lower (4/23 = 17.4%) than the control group (8/25 = 32.0%). Although this was not statistically significant (p=0.2429, chi-square test) the readmission rate did show a decrease for the intervention group. Sales et al. (2014) noticed a reduction in 30 day readmission rates using trained volunteer workers to educate patient with HF. With a larger sample size this may have been proven in this research study.

Application to Theoretical/Conceptual Framework

A self-care deficit occurred when the demands for self-care are greater than the patient's ability to perform (Orem, 2001). Orem's Self-Care Theory provided the basis for this study. The focus of this theory was on the individual or self-care agency performing self-care actions to preserve their quality of life. When a knowledge deficit exist, it is important for the nursing agency to address the knowledge deficit through the supportive-educative venue in Orem's theory. In this study, the African American HF patient was the Self-Care Agency, the Self-Care Demand is knowledge, the Nursing Agency used supportive/educative approach by the investigator, the deficit is individualized education, and the Self-Care education taught to meet the demand was the definition of HF, diet, medication adherence, daily weights, and exercise programs. Before the HF patient can ensure they are doing the right thing towards care, they must gain the necessary knowledge specific to their situation, learn how to cope with the condition, and develop a plan of action to manage the disease process to create longevity that is life sustaining.

Limitations

The limitations to this study included the small sample size, knowledge of participants' disease severity, and a participant's baseline self-care assessment. Even though significance was not found in the 30 day readmission rate, the intervention group had a lower 30 day readmission rate (17.4% compared to 32.0%). A larger sample size may have shown significance with the trend.

The knowledge of disease severity is important to detect the activity tolerance of the participants. If the patient is in severe advanced disease then the exercise component of the pre-test/post-test may be futile. In that instance, diet may need more emphasis. This information helps to individualize each patient.

Veroff et al. (2012) emphasized a self-care survey to establish initial self-care behaviors. A self-care assessment would have given this study a baseline of activities each participant currently engage in self-care. Pre-study activities in self-care could have been measured against post-study behaviors to detect improvement.

Implications for Nursing

Nurses care for patients in a vulnerable state where their expertise are relied upon. Dinc and Gastman (2013) found in the study that patients generally trust the nursing profession. With this in mind, nurses play a pivotal role in the success of the patient adapting to the HF and controlling exacerbations. Education guided by nurses with HF patients modifies behaviors that improve self-care, increase understanding, and may reduce death rates and readmissions (Gonzalez et al., 2014). The implication for nursing is to take a lead role in advocating and collaborating for high risk patients with HF through a theory guided approach. Delivering patient education by phone call can be an inexpensive and effective means for improving patient's knowledge and follow up care. The basis of a relationship involves trust. Individualizing the patient's care in this manner can build meaningful relationships based on trust between healthcare providers and the African American community. This effort can lead to improved outcomes and increased quality of life.

Recommendations

The success of this study was the information gained in order to plan for patients that are in the high risk for exacerbation category such as African American. Based on the study finding, self-care deficits should be explored in patients with HF, the opportunity for education evaluated, and follow up phone calls initiated on a regular basis for improved overall quality of life. It is recommended to follow up this study with a larger sample size to compare the correlation between 30 readmission rates and phone call self-care education in this population based on the limitations.

Conclusion

This study revealed the importance of nurse driven self-care education and follow up for HF patients with a high risk for exacerbation. African Americans have the highest incidence of developing HF with having the worst outcomes out of any group in the United States. Nurses are in a unique position to improve the quality of care for HF patients by education through a trusting and collaborative relationship.

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APPENDIX A

Consent Form

East Carolina University

Informed Consent to Participate in Research

Information to consider before taking part in research that has no more than minimal risk.

Title of Research Study: The Impact of Self Care Education on Heart Failure Patients with a High Risk for Readmission
Principal Investigator: Neil Williams II
Institution/Department or Division: Vidant Medical Center and Gardner-Webb University
Address: 3448 Rounding Bend Drive Winterville NC 28590
Telephone #: 1-252-531-2247

Study Sponsor/Funding Source: na

Researchers at East Carolina University (ECU) and Gardner-Webb University (GWU) study problems in society, health problems, environmental problems, behavior problems and the human condition. Our goal is to try to find ways to improve the lives of you and others. To do this, we need the help of volunteers who are willing to take part in research.

Why is this research being done?
The purpose of this research is to see if education improves outcomes for patients with heart failure. The decision to take part in this research is yours to make.

Why am I being invited to take part in this research?
You are being invited to take part in this research because you have been diagnosed with heart failure. If you volunteer to take part in this research, you will be one of about 50 people to do so.

Are there reasons I should not take part in this research?
I understand I should not volunteer for this study if I do not have a phone or means of follow up contact.

What other choices do I have if I do not take part in this research?
You can choose not to participate. Your treatment and follow up by your physician will be the same regardless if you participate or not.

Where is the research going to take place and how long will it last?
Vidant Medical Center and will last four weeks.

What will I be asked to do?

You are being asked to do the following: Have an interview session that will take approximately 30 minutes which includes a heart failure questionnaire pertaining to the meaning of heart failure, diet, exercise, and medication use. Then you will be randomized to one of two groups: an education intervention group and a control (no-intervention) group. You have a 50% chance of being randomized to either group (like flipping a coin). If you are randomized to the intervention group, you will receive one phone call per week for four weeks. Each phone call will give you educational information on a specific topic. The following topics will be discussed: week one the meaning of heart failure, week two diet, week three exercise and week four medications use with a review of the heart failure questionnaire. Four weeks from the initial interview, you will receive a follow up phone call to review the heart failure questionnaire pertaining to the meaning of heart failure, diet, exercise, and medication use again. Participants that are randomized to the control group will only have the initial interview and a single follow-up phone call four weeks later.

What possible harms or discomforts might I experience if I take part in the research?
It has been determined that the risks associated with this research are no more than what you would experience in everyday life.

What are the possible benefits I may experience from taking part in this research?
Other people who have participated in this type of research have experienced an increase in education. The potential benefit for this research study will be additional reinforcement education that may be used in care management of heart failure. By participating in this research study, you may also experience these benefits.

Will I be paid for taking part in this research?
We will not be able to pay you for the time you volunteer while being in this study.

What will it cost me to take part in this research?
It will not cost you any money to be part of the research.

Who will know that I took part in this research and learn personal information about me?
To do this research, ECU and the people and organizations listed below may know that you took part in this research and may see information about you that is normally kept private. With your permission, these people may use your private information to do this research:

- Any agency of the federal, state, or local government that regulates human research. This includes the Department of Health and Human Services (DHHS), the North Carolina Department of Health, and the Office for Human Research Protections **.**
- The University & Medical Center Institutional Review Board (UMCIRB) and its staff, who have responsibility for overseeing your welfare during this research, and other ECU staff who oversee this research.
- People designated by Vidant Medical Center and Vidant Health;

How will you keep the information you collect about me secure? How long will you keep it?
All data will be stored in the researcher’s office in a locked file cabinet for six year. All electronic data will be stored on an encrypted password protected flash drive and be store in the researchers locked file cabinet after each use for six years. The two identifiers, your name and phone number, will be stripped from all data rendering it unidentifiable.

What if I decide I do not want to continue in this research?
If you decide you no longer want to be in this research after it has already started, you may stop at any time. You will not be penalized or criticized for stopping. You will not lose any benefits that you should normally receive.

Who should I contact if I have questions?

The people conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator at 1-252-531-2247 Monday through Friday from 8am to 5pm.

If you have questions about your rights as someone taking part in research, you may call the Office of Research Integrity & Compliance (ORIC) at phone number 252-744-2914 (days, 8:00 am-5:00 pm). If you would like to report a complaint or concern about this research study, you may call the Director of the ORIC, at 252-744-1971 and the Vidant Medical Center Risk Management Office at 252-847-5246.

Research Participant Authorization to Use and Disclose Protected Health Information

The purpose of the information to be gathered for this research study is to better understand the impact of self-care education on heart failure patients with a high risk for readmission. The individuals who will use or disclose your identifiable health information for research purposes include the principal investigator and subinvestigator. Individuals who will receive your identifiable health information for research purposes include the principal investigator and subinvestigator. The type of information accessed for this research study includes electronic health records. The information will be used and disclosed in such a way as to protect your identity as much as possible; however, confidentiality cannot be absolutely guaranteed. Someone receiving information collected under this Authorization could potentially re-disclose it, and therefore it would no longer be protected under the HIPAA privacy rules (federal rules that govern the use and disclosure of your health information). There is not an expiration date for this Authorization.

You may not participate in this study if you do not sign this Authorization form. You may revoke (withdraw) this Authorization by submitting a request in writing to the principal investigator. However, the research team will be able to use any and all of the information collected prior to your request to withdraw your Authorization.

To authorize the use and disclosure of your health information for this study in the way that has been described in this form, please sign below and date when you signed this form. A signed copy of this Authorization will be given to you for your records.

I have decided I want to take part in this research. What should I do now?

The person obtaining informed consent will ask you to read the following and if you agree, you should sign this form:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I know that I can stop taking part in this study at any time.
- By signing this informed consent form, I am not giving up any of my rights.
- I have been given a copy of this consent document, and it is mine to keep.

____

Participant's Name (PRINT) **Signature** **Date**

Person Obtaining Informed Consent: I have conducted the initial informed consent process. I have orally reviewed the contents of the consent document with the person who has signed above, and answered all of the person's questions about the research.

Person Obtaining Consent (PRINT)	**Signature**	**Date**

APPENDIX B

Heart Failure Pre/Post Test

Heart Failure Pre/Post Test Instrument

Patient Number_____
Date_______________

Section I: Understanding Heart Failure

1. Heart failure is:
    A. The heart has a problem with warming your body
    B. The heart has a problem with supplying enough blood and oxygen to meet the body’s needs
    C. The heart has a problem with beating too fast
2. Contributing factor for heart failure are:
    A. Exercising for 30 minutes or more 4 times a week
    B. Low salt diets
    C. High blood pressure, heart attack, smoking, or excessive alcohol use
3. True or False: Symptoms of heart failure include weight gain, shortness of breath, and swelling in the abdomen and legs.

Section II: Understanding Diet

1. True or False: It is not necessary to avoid alcohol
2. True or False: High salt diets can be harmful to the heart failure patient
3. True or False: Smoking has no effect on your heart and blood pressure
4. True or False: Reading nutrition labels can reveal the amount of salt in a product

Section III: Understanding Exercise

1. True or False: It is important to talk with your doctor before starting an exercise program
2. True or False: Exercise can be beneficial for patients with heart failure

3. True or False: General rule of thumb is to start slowly and increase more each day.

Section IV: Understanding Medication

1. True or False: It is important to take your medications everyday
2. True or False: You can skip doses of your medications if and only if you feel good
3. True or False: Your medications can help control heart failure if taken correctly

Section V: Management

1. True or False: It is not necessary to use the same scale everyday
2. True or False: Daily weights should be done in the morning, after urination, and before getting dressed
3. True or False: It is important to inform your doctor of weight gain more than 3 pounds in a day

______/ 16 = ______ Score

APPENDIX C

Demographics Form

Patient Demographic Form

Assigned Number_________ (1 – 50)

Name: ________________________________

Phone Number: _________________________

Gender:

Male____ Female____

Age range:

25-30__ 31-35__ 36-40__ 41-45__ 46-50__ 51-55__ 56-60__ 61-65__ >65__

Marital status:

Single____ Married___ Separated___ Divorced____ Widowed____ Other____

Education Level:

Completed 4th grade___ Completed 5th grade___ Completed 6th grade__ Completed 7th grade___

Completed 8th grade___ Completed 9th grade___Completed 10th grade__Completed 11th grade__

High school graduate___ GED___ College graduate___ Some College___ Other___

APPENDIX D

Study Data Collection Form

ID#	Age Range	Gender	Marital Status	Education Level	Received Intervention	Readmitted with in 30 days	Pretest score	Posttest Score
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Key	Age Range	Gender	Marital Status	Education Level	Received Intervention	Readmitted with in 30
	25-30= 1	Male = 1	Single =1	4th grade=1	Yes = 1	Yes = 1
	31-35= 2	Female = 2	Married =2	5th grade=2	No = 2	No = 2
	36-40= 3		Seperated =3	6th grade=3		
	41-45= 4		Divorced =4	7th grade=4		
	46-50 = 5		Widowed =5	8th grade=5		
	51-55= 6		Other =6	9th grade=6		
	56-60= 7			10th grade=7		
	61-65= 8			11th grade=8		
	>65 = 9			12th grade=9		
				HS grad =10		
				GED =11		
				College grad=12		
				Some coll =13		
				Other =14		

Key	Age Range	Gender	Marital Status	Education Level	Received Intervention	Readmitted with in 30
	25-30= 1	Male = 1	Single =1	4th grade=1	Yes = 1	Yes = 1
	31-35= 2	Female = 2	Married =2	5th grade=2	No = 2	No = 2
	36-40= 3		Seperated =3	6th grade=3		
	41-45= 4		Divorced =4	7th grade=4		
	46-50 = 5		Widowed =5	8th grade=5		
	51-55= 6		Other =6	9th grade=6		
	56-60= 7			10th grade=7		
	61-65= 8			11th grade=8		
	>65 = 9			12th grade=9		
				HS grad =10		
				GED =11		
				College grad=12		
				Some coll =13		
				Other =14		