EXPLORING NURSES' KNOWLEDGE AND COMFORT AS HEART FAILURE
EDUCATORS IN A NON-CARDIAC ACUTE CARE ENVIRONMENT PRIOR TO
PROVIDING AN ONLINE LEARNING MODULE

by

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ABSTRACT

NICOLE PHAY WARE. Exploring nurses' knowledge and comfort as heart failure educators in a non-cardiac acute care environment prior to providing an online learning module (Under the direction of DR. CHARLENE WHITAKER-BROWN)

Heart Failure (HF) is a global health epidemic, with approximately 6.5 million people living with the diagnosis in the United States alone. HF is a chronic disease and is progressive, however it is also manageable if current guidelines are part of patient teaching. Nurses at the bedside are the primary educators of patients with chronic diseases and therefore they must stay abreast of evidence-based guidelines. This scholarly project explores the current HF knowledge of novice and experienced nurses in an adult, acute care environment that does not typically admit patients with HF as a primary diagnosis. Prochaska and DiClemente's Transtheoretical Model of Change was applied to assist this researcher with a systematic approach to assessing levels of knowledge and creating an online learning module to address the needs of the adult learner. Fifty bedside nurses participated in a two cohort study that measured knowledge of HF utilizing the validated Nurses' Knowledge of Heart Failure Principles Survey. Two cohorts of bedside nurses were given access to an online education module once their baseline knowledge had been assessed. Nurses were asked pivotal questions related to years of service, age, certification, and comfort as HF educators. Results revealed that the nurses may not have the most current knowledge of HF principles. The study results confirmed the theory of the literature in similar studies with larger sample sizes. Where there were gaps in knowledge in more than 50% of the members of the cohort in the previously identified

areas not more than 11% requested follow up information in any of one of the domains.
The findings of the study suggests the need for baseline measurement of knowledge and
continuing education in all nurses caring for patients with HF to enhance self-
management reduce readmission.

DEDICATION

I would like to dedicate this work to my village. With a special dedication to my husband H. Jerel Ware and children Harlan J. Ware II and Hannah J. Ware. The three of you embody the sweet and simple love I require to make it all make sense.

ACKNOWLEDGEMENTS

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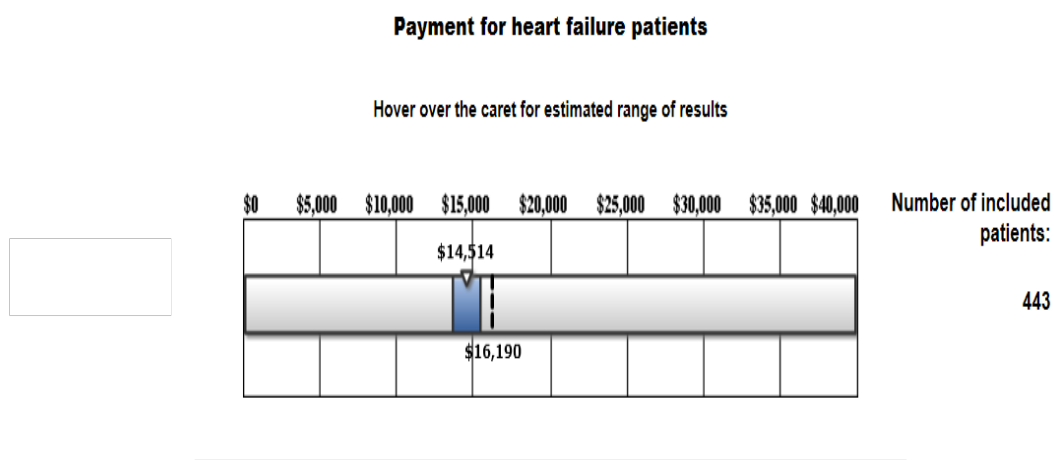
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CHAPTER I: INTRODUCTION

Background

In the United States of America, there are approximately 6.5 million adults diagnosed with heart failure (HF) (Centers for Disease Control and Prevention [CDC], 2016). Approximately 550,000 new cases are diagnosed every year, and one-half of those diagnosed will die within five years (CDC, 2016). The nation generates a combined cost of medications, treatment, and lost productivity estimated to be close to $37.7 billion each year (CDC, 2016). Ten out of every 1,000 individuals aged 65 and older will be diagnosed with HF. Heart Failure is one of the most common reasons for hospitalization of those over the age of 65 (Centers for Disease Control and Prevention, 2012). National readmission rates for HF as primary diagnosis within 30 days, lingers around 20% with an estimated cost of $32 billion each year (Whitaker-Brown, Woods, Cornelius, Southard, & Gulati, 2016).

Locally, the fiscal impact in a Piedmont area hospital in North Carolina reflects a HF treatment cost of $72,514 in 2013 and in 2015, $44,492 in Center for Medicaid and Medicare Services (CMS) penalties (Lampman, 2016). Penalties are expected to increase significantly as readmission penalties become more severe. In 2013, the mean cost across the country for HF readmission is $13,000. As of 2017 that cost rose to more than $16,000 per patient (Figure 1). In 2015, one unit incurred $533,000 dollars of revenue lost. In 2017, those losses increased to $1,352,000. The loss continues on the other unit. In 2015 the losses were $1,001,000, rising to 1,066,000 in 2017. The average readmission rate was 25.1%. These numbers reflected a 118% increase over the cost of

the initial admission of the HF patient on average (Rizzo, 2013). The rate of readmission

in the Piedmont hospital is currently on par for the national average of 21.6%

(Medicare.gov, 2017). While the cost per patient at $14,514 is less than the current

national average of $16,190, that cost is still significant (Medicare.gov, 2017).

Payment for heart failure patients

Hover over the caret for estimated range of results

$0	$5,000	$10,000	$15,000	$20,000	$25,000	$30,000	$35,000 $40,000	Number of included patients:
			$14,514					
								443
			$16,190					

Figure 1. Medicare Payment Table (Medicare.gov, 2017)

Readmission is expensive. Readmission is defined by the Centers for Medicare

and Medicaid Services as a subsequent admission to a hospital for any cause within 30

days of discharge from the same or a different hospital (Centers for Medicare and

Medicaid Services, 2016). Charges incurred for patients readmitted for the same primary

diagnosis of HF within 30 days of discharge, will not be reimbursed by Medicare or

Medicaid. Those lost reimbursements are the source of the lost revenue. According to

Krames (2016), the key to driving down these costs is quality patient education. Patients

who receive a clear message about discharge instructions, medication, and follow-up care

are 30% less likely to be readmitted or require emergent care as patients who do not

receive this information (Krames Patient Education-Boston University, 2016). (See

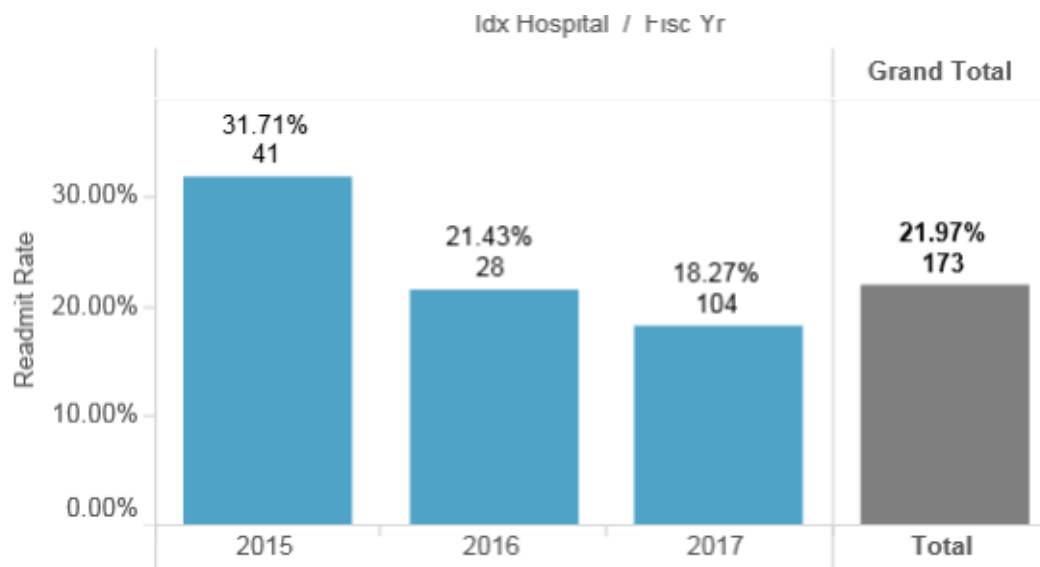Figure 2 and 3).

Unit 4-1 Unplanned Readmission Data 2015-2018

Figure 2. Piedmont Area Hospital Unplanned Admissions 4-1
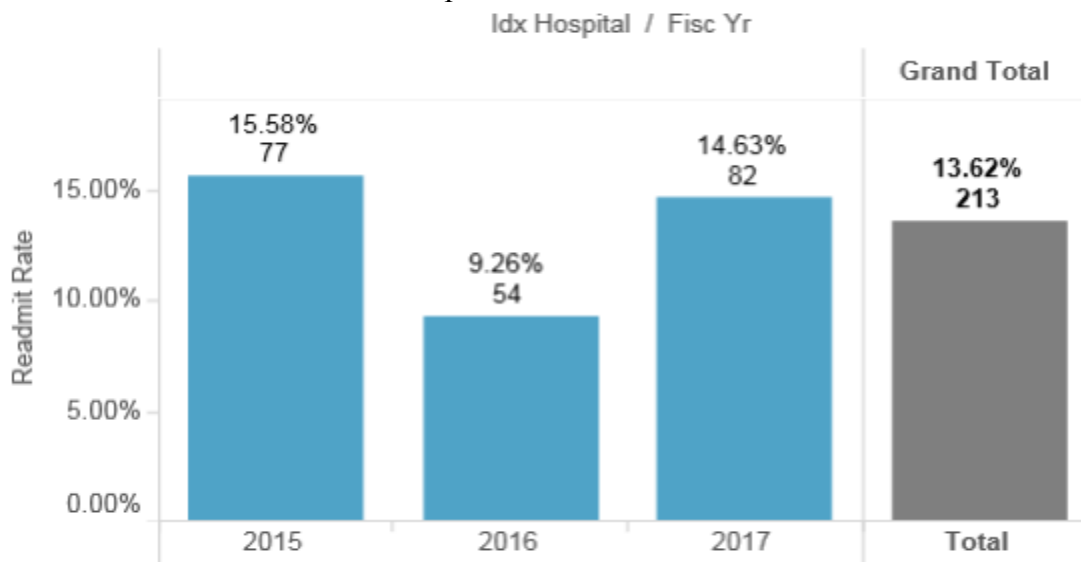
Unit 5-1 Unplanned Readmission Data 2015-2018

Figure 3. Piedmont Area Hospital Unplanned Readmissions 5-1.

HF Pathophysiology

HF is a pathophysiologic process that occurs when the heart muscle is unable to supply adequate cardiac output. This condition results in increased diastolic filling pressure in the left ventricle, inadequate tissue perfusion, or both. Thusly, creating a condition of increased pulmonary capillary pressure (Brashers, 2010). HF is a syndrome that consists of increased symptoms, decline in ability to function leading to hospitalization, correction of fluid balance, and a discharged patient who feels much better. So much better, that variation from medication plan and liberties with diet restrictions are the most common reasons the patient returns seeking care (Grange, 2005). One way to break the cycle of re-hospitalization is to prepare nurses to provide patients with education about the disease process, medications, and what changes in condition warrant seeking medical attention (Grange, 2005).

HF Symptomology

HF is a chronic and progressive disease that must be managed and exacerbation abated. Each exacerbation can contribute to progression of severity of disease and diminish patient's ability to care for self and complete activities of daily living (National Heart & Lung and Blood Institute, 2015). The goals of HF management include symptom reduction and maintenance of or improvement in muscle contractility. Symptoms include shortness of breath, weight gain, edema in lower extremities, belly, back or other dependent areas, unexplained weakness, and fatigue (CDC, 2016). Symptoms are progressive and dictate the classification/severity of the disease. The Criteria Committee

of The New York Heart Association (1994), developed a classification system based on exertion needed to cause symptoms;

Class I: No symptoms causing limitation of physical activity

Class II: Minimally limiting to physical activity. Ordinary activities of daily living cause fatigue, shortness of breath or chest pain that is relieved with rest

Class III: Moderately limiting to physical activity. Minimal attempts at activities of daily living cause fatigue, shortness of breath, palpitations, and chest pain that is relieved with rest

Class IV: Maximum limitation to physical activity. Unable to complete any activities of daily living without experiencing distress and experiencing the symptoms even at rest.

One of the most common risk factors associated with HF is coronary heart disease. Coronary heart disease is also considered the costliest medical diagnosis in US according to Whitaker-Brown et al. (2016). Genetic polymorphisms have ties to the development of HF as well. These genetic indicators include genes for cardiomyopathies, genetic alterations in kinases, phosphatases, and calcium channels (Brashers, 2010). Other common risk factors for HF include: advancing age, hypertension, ischemia, obesity, and kidney disease (Brashers, 2010). Congenital defects, alcohol abuse, inflammation of the heart muscle along with pathology of the valves within the heart can also lead to heart failure (Brashers, 2010).

HF and Nursing Education

Nurses new to the profession complete training and preceptor programs that are designed to prepare them for the expectations of the role. In these programs, which vary greatly from facility to facility, nurses train to model the actions, attitudes, and skills of their preceptor (Blevens, 2016). In addition to the technical and task related skills, nurses are required to develop coping skills to manage duties as assigned, time management, and peer relations. These nurses are expected to teach most of what they have just learned to their patients and most are never assessed to determine their feelings of efficacy as educators (Blevens, 2016). Bandura points out that in some cases attitudes related to efficacy are already established. Training and a supportive environment for the new nurse, strengthen the perception of self-efficacy, which is increased with experience (Bandura, 1993). Experienced nurses become preceptors and educators of novice nurses. Knowing that it is important to be aware of the knowledge level of nurses as well as their confidence in that knowledge.

According to Redmond and Slaugenhoup (2016), there are four sources that influence perception of self-efficacy:

1. Previous success or mastery, observation of the concept or behavior

2. Observational learning of a behavior or concept

3. Verbal feedback, positive or negative

4. Emotional cues and triggers

The source with the most impact on self-efficacy is mastery (Redmond & Slaugenhoup, 2016). In-depth knowledge of the content to be taught conversely

determines the ability and likelihood that the nurse will feel confident enough to teach the information.

Problem Statement

The nursing role as patient educator is vital to the successful outcomes of patients with chronic diseases (Albert et al., 2015). As a prerequisite to fulfilling this role, the nurse must master the knowledge and skills essential to successful interaction with patients. The well-educated nurse is an element important to the successful outcomes of patients (American Nurse Journal, 2014). When patients are provided education designed to meet their unique needs, they achieve decreased hospitalizations and better outcomes (American Nurse Journal, 2014). For information to be properly disseminated to the patients, families, and caregivers, nurses must have a thorough understanding of the materials and available resources (Ware, 2016).

Purpose of the Project

The purpose of this doctoral project was to measure the baseline knowledge of HF principles in nurses that don't typically care for patients with a primary diagnosis of HF. The project also sought to affirm or deny that mastery of information is a dependable determinant of perception of self-efficacy, and therefore comfort with providing education to patients about HF (Redmond & Slaugenhoup, 2016). In addition, the project provided an online learning module to all participants focused on the evidence-based principles of HF management in an effort to increase knowledge of HF self-management.

Significance of the Project

Most of the issues causing the preventable readmission of HF patients are related to inadequate knowledge about self-care at discharge (Mahramus, Penoyer, Frewin, Chamberlain, & Sole, 2014). Patients are expected to manage this disease independently. The lack of success of this is seen in national readmission rates of 25%, while best practice says it should be closer to 16% (Ermis & Melander, 2012). As hospital stays become shorter, the role of the RN becomes more demanding. The bedside nurse has more interaction with the patient than anyone on the multidisciplinary team (Albert, 2016). The comfort and knowledge specific to HF themes related to caring for hospitalized patients is unknown (Albert, Aspinwall, Liu, Best, & Cohen, 2011). Exploring whether or not nurses are knowledgeable and informed is vital to ensuring that the patients receive the most accurate information at discharge (Albert et al., 2002). Significant indicators were revealed when measuring the level of knowledge and degree of comfort as educators of HF principles in nurses on units that don't typically care for HF patients. Consideration was given the impact of the age of the nurse, years of experience, nursing certification, and perceived comfort on actual knowledge of HF. The survey revealed actual baseline knowledge and confidence in that knowledge. The gap in baseline knowledge determines misplaced confidence.

Clinical Question

PICOT question for doctoral project: Do nurses that do not typically take care of patients with HF as a primary diagnosis have proficient knowledge of the basics of HF

self-management and report comfort as HF educators perceive a need for an online learning module?

Project Objectives

The short-term objective was to determine the baseline knowledge of basic heart failure principles in bedside nurses that do not typically take care of patients with that diagnosis. The long-term objective was to increase awareness of knowledge gaps in the care of heart failure patients and provide comprehensive education to address those gaps in anticipation of decreasing readmission.

CHAPTER II: LITERATURE REVIEW

An extensive literature review was conducted using CINAHL, PubMed, and Cochrane, using the search terms heart failure, nursing education, discharge teaching, nurse educators, and heart failure principles (Appendix A). HF is a chronic disease whose effects are irreversible and progressive (Albert et al., 2002). HF is a major public health issue with a current prevalence of 6.5 million individuals currently having the diagnosis in the United States (CDC, 2016) and 26 million worldwide (Cowie, 2014). Moreover, the number of HF diagnosis in the U.S. is expected to rise by 46% by the year 2030, to more than eight million (American Heart Association News, 2017). HF is a global public health issue according to Bui, Horwich, and Fonarow (2011). When looking at industrialized nations, 1-2% of the population is living with heart failure currently and the treatment of heart failure consumes 1-3% of health care resources available (Cowie, 2014). HF accounts for 1-3% of all hospitalizations with an average stay of 5-10 inpatient days (Cowie, 2014). Patients hospitalized for HF have a 1 in 4, or 24% readmission rate within 30 days of discharge and 1 out of 2, or 46% are readmitted within 60 days of discharge for a HF diagnosis (Cowie, 2014).

HF is not a singular diagnosis, but a complex clinical syndrome that can be triggered by a litany of risk factors including coronary artery disease, age, obesity, hypertension smoking, and diabetes (Bui et al., 2011). HF is a disease process that places a large economic burden on the health care system. This burden can largely be attributed to frequency and length of hospitalization required to stabilize these patients (Bui et al., 2011). As the cost of HF treatment rise, researchers continue to look at ways to prevent

exacerbation of symptoms leading to readmission. The literature shows that nurses are not prepared as heart failure educators and that patients did not believe they were able to control heart failure. (Albert, 2013). Poor compliance with self-care and disease management is most often found to be the factor that leads to worsening of symptoms in the HF patient (Albert et al., 2002). Though treatment approaches vary related to setting and provider, the one thing that the literature agrees on, is the importance of the continuum of patient education. Ultimately, patients who are well educated in self-care have reduced hospitalizations and better quality of life overall (Albert et al., 2002).

A portion of the increase in patients diagnosed with HF is being attributed to increased survival rates of patients experiencing myocardial infarction, medical advances that allow longer life spans, and an increase in obesity rates (American Heart Association News, 2017). A consensus of the literature agrees that the primary way to improve care and prevent deaths from HF, is to improve means and modes of patient education. Nurses are the primary source of patient education in the inpatient setting (Albert et al., 2002). Formal nursing education curriculum covers pathophysiology of HF, and nursing orientation to practice deals mostly with facility specific rules and regulations (Albert et al., 2002). A review of the literature revealed that prior to 2002, there was no data about the specific learning needs of the nurse when required to teach self-care to heart failure patients (Albert et al., 2002). While there has been extensive research done to discover the learning needs and styles of patients, not much looks at the learning needs of the nurses expected to educate the patients. Research affirms that for patient education to be effective, the educator must have a proficiency of knowledge of HF (Albert et al., 2002).

The medical-surgical practitioner must understand diseases, diagnoses, and treatment modalities to function as a caregiver and educator (Harmon, 2016).

Albert et al. (2002) introduced a standardized tool to measure the subject knowledge level of nurses taking care of and educating HF patients. This survey revealed that nurses scored poorly, having <75% right answers on the eight domains of heart failure teaching. The study associated with the tool revealed that when exploring the eight domains of HF teaching; medications, diet, weight gain, fluid restriction, activity, signs and symptoms of exacerbation, and recognition of fluid overload, nurses scored poorest in areas most vital to patient survival and avoidance of hospitalization. Recommendations from subsequent studies reconfirmed that nursing knowledge was a contributor to patient lacking education in self-care (Albert, 2016). Delaney, Apostolidis, Lachapelle, and Fortinsky (2011) used the validated tool to reveal a 79.9 % knowledge level when administered to a cohort of nurses serving HF patients in their homes. Typical of studies utilizing Nancy Alberts Nurses Knowledge of Heart Failure Principles survey, Mahramus et al. (2013) discovered that a cohort of 90 nurses had an average total knowledge score of 71%. In this study only 8.9% of the cohort received a passing score of 85% and this score was not an anomaly, more like the norm (Mahramus et al., 2013).

The nurse's role as educator is critical to the successful outcomes for patients with chronic diseases like HF. Whitaker (2015) confirmed that nurses struggle with the challenges of discharge teaching at a level that can affect outcomes. Measuring that knowledge can help to identify areas of weakness that could be addressed to influence better outcomes. This is important because the literature shows that nurses are not

prepared as heart failure educators and that patients did not believe they were able to control heart failure. (Albert, 2013). Gilmour, Strong, Chan, Sue, and Huntington (2014) stated that a consistent approach to heart failure education helps to reveal and address gaps in knowledge in the most meaningful way and changes can be made to the way the principles of HF education are taught to the patient. Curtis et al. (2012) points out that an application of LEAN performance improvement model, when applied to aspects of care such as daily weights, can really make a difference in care and set an example for the patient. Nurses at the bedside are the primary educators of patients with chronic illnesses, making it necessary to develop and apply appropriate heart failure nursing education (Gilmour et al., 2014).

Nurses also benefit when they have mastery of the basics of HF self-care domains. These domains being diet, fluid balance, signs and symptoms of exacerbation, activity intolerance, weight, medication, exercise, and fluid restriction (Albert et al., 2002). In addition to nursing mastery of heart failure self-care contributing to better patient outcomes, mastery produces the highest level of perceived self-efficacy (Bandura. 1993). Nurses who experience mastery of HF's basic principles of self-care, experience improved perception of self-efficacy as educators and are more comfortable educating. Some individuals have low perception of self-efficacy overall and therefore are not comfortable educating patients. Mastery of materials combined with positive and focused feedback can increase comfort level and as a result, improve patient outcomes (Redmond & Slaugenhoup, 2016). The AACN recommends national heart failure

certification as a way to demonstrate expert knowledge and commitment to exemplary care (Hastings & Felicia, 2012).

Gaps in literature include inconsistent measurement of ongoing knowledge of nurses exposed to HF education with the intent of improving them as educators. There was no literature found related to nurses being measured for knowledge of HF prior to becoming educators. In addition to these gaps, it was challenging to find these kinds of knowledge validation exercises occurring with other chronic disease processes where education can change outcomes.

Theoretical Framework

The Prochaska and DiClemente's Transtheoretical Model of Change was applied to this DNP project. Change is an expected part of any process, and healthcare delivery is no exception. This change theory was pertinent to this DNP project because research showed that nursing knowledge of basic HF principles may be less than optimal (Albert et al., 2002). Sare and Ogilvie (2010) pointed out that there are four specific actions that help to prepare for change. Change is best when anticipated. Therefore, if the preparation is thorough a smoother transition can be facilitated (Sare & Ogilvie 2010).

1. Identifying the fundamental pattern- How are things functioning. What is the current pattern, work-flow, and climate?

2. Acknowledging that a change is needed- The first step is admitting that things are not working optimally and that there is an actual need for change.

3. Examining the moving parts and components of the situation- The interconnectedness may be challenging to when attempting to initiate the best approach.

4. Maintaining a clear view of what must change, while maintaining a sense of what else needs to adjust for the change to occur.

Prochaska and DiClemente developed their explanation of the Transtheoretical Model (TTM) for Change in 1983. The model was born of a comparative review of greater than 300 fragmented theories interwoven to produce a model of change process (Hergenrather, 2012). The model incorporated the consciousness raising theory of Freud, contingency management of Skinner and helping relationships model of Rogers. Originally designed as an approach to substance abuse cessation and mental health behavior modification, this model has also been instrumental in establishing effective approaches to health behavior change (Hergenrather, 2012). One distinct component of TTM is the fact that it is designed for intentional change. Everyone must make the choice to change. The successful outcomes of some individuals versus others had been attributed to the ability to effectively apply this model to their situation (Step Up Program, 2012).

There are six actual stages of the Prochaska and DiClemente Change Model: (Sare & Ogilvie, 2010)

1. Pre-contemplation

2. Contemplation

3. Preparation

4. Action

5. Maintenance

6. Termination- Address drift (Hergenrather, 2012)

Prochaska and DiClemente's change model is usually associated with individuals seeking to change a behavior. To that point, the text points out that this theory is used quite often by nurses to initiate changes in the behavior of patients. It was the intent of this project to apply the TTM theory to the nurses themselves to effect change in education delivery. The fundamental concepts of TTM include: the process of change, decisional balance, self-efficacy, and temptation.

The process of change has steps that are strategies and are used by individuals that successfully make the changes desired. The first steps fall into the category of "experiential process". These steps include increasing consciousness, dramatic relief, environmental re-evaluation, social liberation, and self-re-evaluation. These steps are used in the beginning and will be the stage for the behavior change to follow (Leer, Hapner, & Connor, 2007).

The second set of steps are considered the "behavioral process". These steps are used later in the process of transition. These steps are: stimulus control, relationship support, counter conditioning, rewards, and commitment to the process in an ongoing and meaningful way (Leer et al., 2007).

The change is purposeful when applying this theory. The pros and cons are considered and the change becomes a decision and no longer an option. The most attractive component of this theory is that it contains an element of self-efficacy.

Confidence in the ability and competence to be successful in a specific task, increases the chances that the desired outcome will occur and not be avoided. This element of the theory is grounded in Bandura's Self-Efficacy Theory (Leer et al., 2007).

Theoretical Application

There is a general culture of assumed competence in knowledge and comfort with patient education for nurses in the medical surgical nursing area of the hospital. HF education is an example of an area where education is key and the providers of said education is assumed to be competent, and confident in disseminating accurate and valid information (Albert et al., 2015). An assessment of strengths, weaknesses, opportunities, and threats (SWOT) was performed prior to application of the theory (Appendix B).

Pre-contemplation Stage- Met with committee members and stakeholders to discuss HF statistics and how they affect our hospital. Discussed research about nursing knowledge of HF basics. This stage offered an opportunity to examine perception of nursing staff as educators and how that might be affecting HF readmission. This was also an opportunity to discuss possible interventions to improve outcomes.

Contemplation Stage- In this stage units of the hospital were identified and being in need of knowledge validation. Nancy Albert's Nurses Knowledge of Heart Failure Principles Survey was chosen as the validated tool that would be used to validate nursing knowledge.

Preparation Stage- The content was finalized and the learning module was designed. It was at this time that the Qualtrics platform was chosen as the mode of

delivery for both the survey and the learning module. The Qualtrics survey was built and introductory email sent out to nurses on designated units.

   Action Stage- Invited all nurses in area of focus to complete the Nurses' Knowledge of Heart Failure Principles Survey along with an online learning module. The module was comprised of accurate and succinct information about HF. Thirty days following the initial offering, the nurses were again given the opportunity to complete the survey and learning module online. Demographic information was asked again in both offering in an effort to gather information that would make the data more meaningful. Comfort as educators was once a question in both offerings as well.

   Maintenance and Relapse Prevention- Stakeholders were presented with the data following the information. This data revealed a gap in knowledge, real and perceived over all knowledge level of 79% in the first cohort and 84% in the second. It was revealed that the knowledge level of the nurses is less than desirable and that current process is not producing the best outcomes. There was a willingness to change voiced by the stakeholders.

CHAPTER III: METHODOLOGY

Project Design

The project design was an interventional cohort study with voluntary survey design. The measurement of baseline knowledge and comfort, along with an online educational module, was administered in this study. Measurement of knowledge was followed by a focused HF learning module that addressed all basic principles of HF self-management. The learning module was available on a PowerPoint platform online to all who participated in the survey.

Participants

Registered nursing staff from two medical units with the standard of practice that does not include care for patients with a primary diagnosis of HF were recruited to participate in a survey and online learning activity.

Setting

A 362-bed community acute-care hospital, in the Piedmont area of North Carolina and was used to host this doctoral project. The hospital offers emergency, medical surgical, and women's services. It is a Joint Commission Certified Stroke Center and offers a wide range of outpatient services as well. This evidence based project took place on inpatient medicine units in a community acute-care hospital.

Tools and Measures

The validated tool used to evaluate knowledge for this project was Nancy M. Albert's Nurses' Knowledge of Heart Failure Education Principles Survey which originated at the Cleveland Clinic (Appendix C). The tool is a 20 item, true (yes) or false

(no) written survey designed to measure the knowledge of a nurse related to HF self-management and has been addressed for validity and reliability. (Albert et al., 2002). In addition to the validated tool, five questions were asked related to experience, certification, level of education, age, and comfort level as heart failure educators (Appendix D). These questions were included in an attempt to gain knowledge about the nurses and their practice.

Inclusion Criteria- A convenience sample of 50 nurses who take care of HF patients. These nurses were sampled from the general medicine floor.

Exclusion Criteria- Any nurse that did not wish to participate, those not involved in taking care of patients and those not involved in patient teaching or serving as preceptors to novice nurses were all excluded from the project.

Method of Data Collection- Nurses on the two medical units received an introductory communication document in their email (Appendix E). An emailed consent form with written instructions was distributed to all nurses in areas of focus. The validated Nurses' Knowledge of Heart Failure Education Principles Survey was distributed in the form of a Qualtrics survey. The nurses were not asked for any identifying data. Permission to use the survey was granted and rights purchased from the Cleveland Clinic. In addition to the HF knowledge survey, demographic information questions were asked related to age, years of practice, education level, national certification and comfort level with providing HF education. The nurses were able to complete this survey from any work computer. Thirty-two nurses completed the survey in the first cohort. Those nurses completing the 20-question survey were given access to a

heart failure education computer based module. Forty-five days later, 18 nurses comprising the second cohort completed the Nurses' Knowledge of Heart Failure Education Principles Survey.

CHAPTER IV: RESULTS

Project Results

Data Analysis- Using SPSS version 22, the data was compiled and analyzed for raw score and with areas identified in five categories: diet (3 questions), fluids and weight (7 questions), signs and symptoms of worsening condition (6 questions), medication (2 questions), and exercise (2 questions). Descriptive statistics were used to determine significance of results. Knowledge was measured on two separate units that are not cardiac in focus so they do not typically have patients admitted with a primary diagnosis of heart failure. Outcomes of the survey were aimed at discovering which areas of HF education represented the greatest lack of knowledge. In addition, an attempt was made to establish a relationship between mastery of knowledge and perception of comfort in disseminating that knowledge. Questions were also asked that aimed at identifying knowledge gaps as they relate to demographic information and perception of comfort with patient education.

The mean score for all taking the survey in the first cohort was 79% (Figure 4). The areas of knowledge deficit in the first cohort of 32 nurses were found to be the use of potassium based salt substitute, the use of over the counter medications (OTC) such as non-steroidal anti-inflammatory medications (NSAIDS), transient dizziness, daily weight standard and asymptomatic hypotension. When asked about potassium based seasoning being an appropriate substitute for salt, only 65% of the nurses answered correctly. Only 59% of nurses were aware of the need to avoid the use of NSAIDS patients with heart failure. Transient dizziness upon standing was incorrectly identified as a reason to notify

a physician by 54% of the 32-nurse cohort. Scoring just 37% and 31% respectively in the

knowledge are of ideal weight comparison and asymptomatic hypotension revealed the

most serious knowledge gaps of the first cohort.
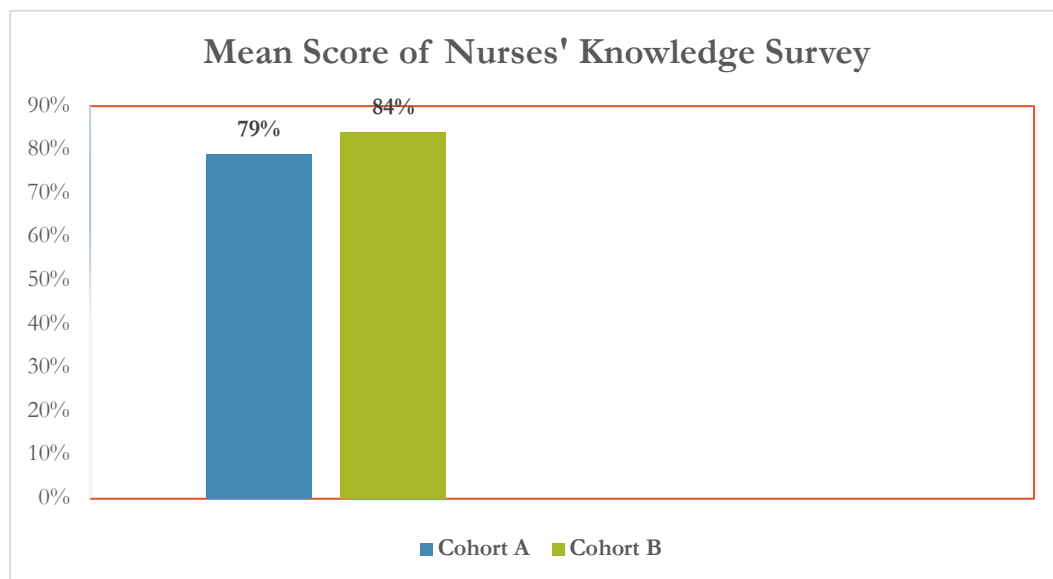
Figure 4. Mean Score Table

Following the first cohort scoring and self-identified knowledge needs all had an

opportunity to take a computer based HF education module. There was time to discuss

and ask questions related to the module, as well as request more information related to

specific questions. Forty-five days later the Nurses' Knowledge of Heart Failure survey

was made available to nurses in the same units again.

The scoring for the second cohort revealed some improvement in knowledge. The

mean score increased to 84% overall. This is an increase of 5% from the first cohort.

Even with the increase in median score, some gaps in knowledge remained consistent

from cohort to cohort. The use of OTC medications score had risen to 83% overall and
Potassium based seasonings just shy of the pass score of 75% at 72%. However, ideal
weight comparison, asymptomatic hypotension and dizziness that resolves within 5
minutes 50%, 33% and 50% correct, respectively (Figure 5).
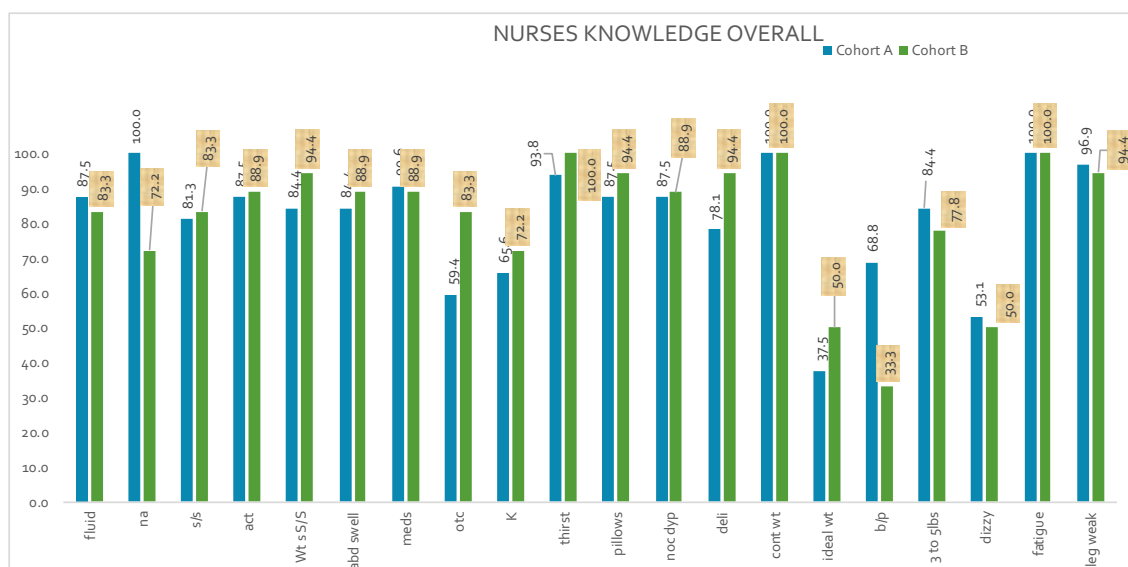
Figure 5. Nurses' Knowledge Overall

Nurses were also asked to self-identify areas of HF principles where they would
like to have more information. There was a gap in perceived knowledge versus actual
knowledge as revealed in Figure 6 below. Where there were gaps in knowledge in more
than 50% of the members of the cohort in the previously identified areas not more than
11% requested follow up information in any of one of the domains. Final analysis of the
data also determined that age of nurse, national certification, and years of service had no

significant bearing on knowledge level of HF principles or comfort level as a HF patient educator.
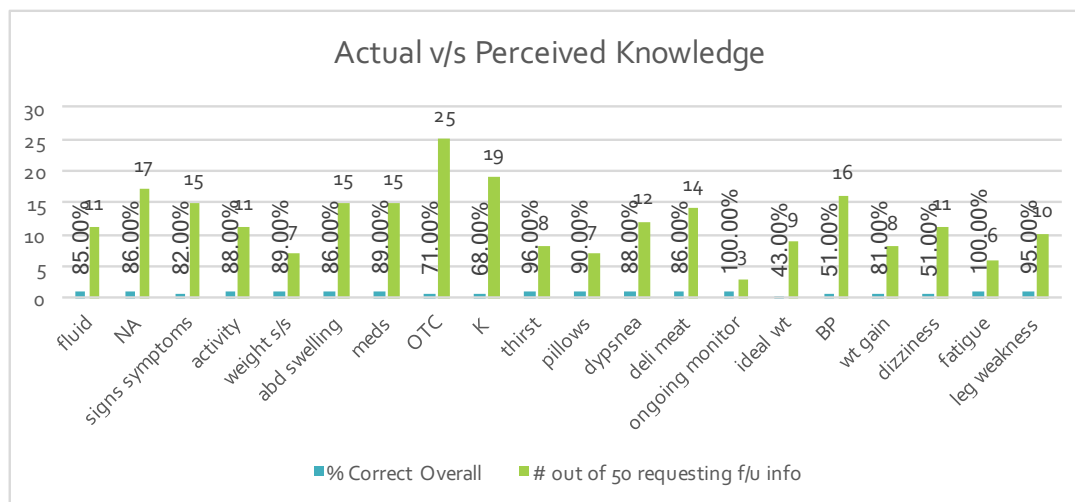

Figure 6. Actual V/S Perceived Knowledge

Nurses was also asked to self- identify level of comfort as HF educators. While Figure 6 shows that nurses have less actual knowledge than they perceive they do, comfort level as educators remains high. Figure 7 reveals that only 2% of Cohort A and 0 % of Cohort B felt uncomfortable educating patients about HF. This data when compared to Figure 4 which shows mean knowledge scores of 79% and 84% for Cohorts A and B respectively, reveals an overconfidence in ability that is not correlated to knowledge.
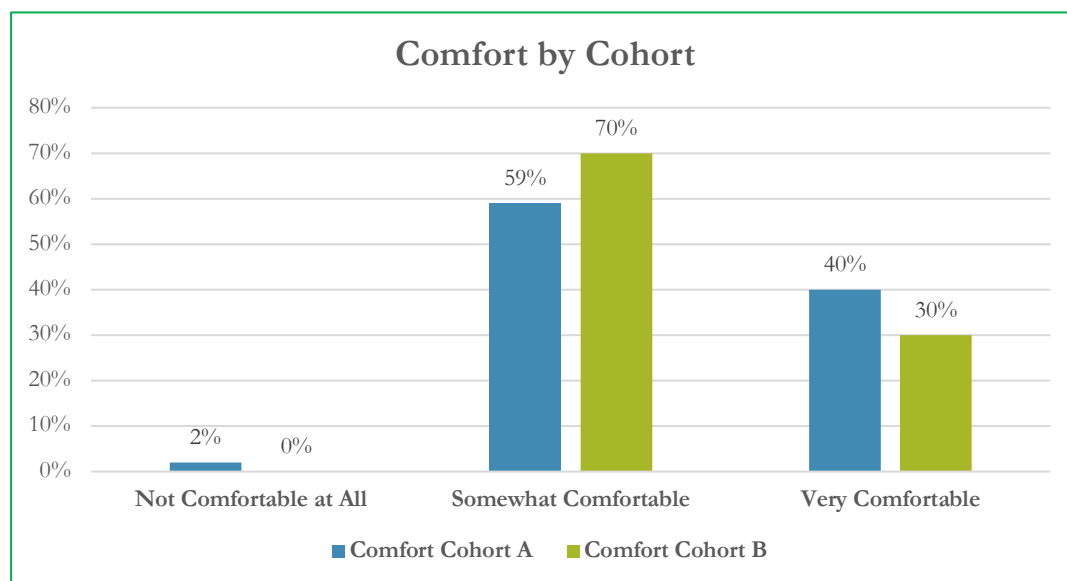
Figure 7. Comfort by Cohort

CHAPTER V: PROJECT SIGNIFICANCE

This doctoral scholarly project augments the literature that has been published to date on the benefit of measuring baseline knowledge of HF principles in nurses that don't typically care for patients with a primary diagnosis of HF.

Sustainability

The goal of the project was to increase nurses' comfort with HF patient education through mastery of clinical knowledge. Going forward the goal is that nurses will experience a heightened sense of ability and effectiveness as educators as evidenced by willingness to teach, validity of information taught, and the desire to apply this concept to any subject matter that places them outside of their comfort zone. Developing and instituting a comprehensive heart failure education for both new and experienced nurse can facilitate understanding on how nursing interventions affect patient outcomes on a larger scale (Gallagher, Novosel, McAvoy, & Maida, 2011).

Impact on Practice and Recommendations

Limitations of the study included a small sample size, less than optimal access to time to complete module, and survey in one sitting. Additional feedback related to learning module would have been beneficial going forward. There was some redundancy in respondents.

Recommendations moving forward would be to expand the survey to all medical surgical units in the system as well as the emergency departments. By measuring the knowledge of nurses taking care of all patients, understanding of the accuracy of patient education can be ascertained. Once a clear picture of the knowledge gaps is established, a

comprehensive and standardized heart failure teaching method would be implemented for all nurses taking care of patients with a heart failure diagnosis, even if it is not the admitting diagnosis. This intervention would lead to increased nurse competency and provide the best education for heart failure patients (Arens, Ashman, Kixon, & Mansfield, 2012).

Implications for Future Research

In conclusion, it is the hope that the concept of measuring the knowledge level in nurses who educate will become best practice. Going forward for future research, chronic diseases like Diabetes Mellitus, Chronic Obstructive Pulmonary Disease, and Hypertension would all be designated as high alert diagnosis requiring validated knowledge level measurement in nurses charged with providing patient education. Standardized teaching and regular measurement of competency in novice and experienced nurses should be the standard. By having nurses with validated knowledge, penalties for readmission should decrease and reimbursement for services, increase.

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APPENDIX A

Exploring Nurses' Knowledge Synthesis Table

Levels of Evidence	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Level I: Systematic review or meta-analysis													X	X							
Level II: Randomized controlled trials										X											
Level III: Controlled trial without randomization																					
Level IV: Case control or cohort study							X				X	X									
Level V: Systematic review of qualitative or descriptive studies																					
Level VI: Qualitative or descriptive study	X	X	X	X	X	X		X	X						X	X	X	X	X	X	X
Level VII: Expert opinion or consensus																					

APPENDIX B

Nurses' Knowledge of Heart Failure Principles Project SWOT Analysis

NURSES' KNOWLEDGE OF HEART FAILURE PRINCIPALS PROJECT SWOT ANALYSIS

S **Strengths**
- Fiscal benefit to improve outcomes
- Stakeholder buy-in
- Evidence to support quality education as an intervention
- A desire to be the best.

W **Weaknesses**
- Cost of implementing a standardized tool
- Online tool with minimal supervision
- Resistance to additional education
- Nurses in study do not typically care for HF patients.

O **Opportunities**
- Excellent opportunity to educate about the importance of secondary and tertiary diagnosis.
- Better outcomes
- Elevated level of care, empowered nurses with mastery of concepts
- Stronger preceptor knowledge base
- I ncreased perception of self-efficacy.

T **Threats**
- External threats that negatively affect the HF education intervention include poor nurse buy-in
- Inadequate knowledge of the importance of mastery of information
- Drift

APPENDIX C

Nurses' Knowledge of Heart Failure Education Principles Survey

Cleveland Clinic

Nurses Knowledge of Heart Failure Education Principles Survey

Healthcare Instrument

Dear Nurse:

The attached survey was designed to assess your education needs related to self-management of heart failure. Specifically, we wish to learn your education needs in instructing patients about taking care of themselves in their homes (either after hospital discharge, or in general).

Please complete the following 20 item **yes (true)** / **no (false)** survey to help us determine your needs.

Instructions:

Please answer each question by placing an **X** in the yes or no answer box. If you would like more information on the topic in the question, place an **X** in the box to the left of each question marked *Need more Info on Subject?* If you do not know the correct answer, give us your best guess but please answer every question, even if you requested more information.

Need more Info on subject?	Question	Yes (T)
☐	1. Patients with heart failure should drink plenty of fluids each day.	☐
☐	2. As long as no salt is added to foods, there are no dietary restrictions for patients with heart failure.	☐
☐	3. Coughing and nausea/poor appetite are common symptoms of advanced heart failure.	☐
☐	4. Patients with heart failure should decrease activity and most forms of active exercise should be avoided.	☐
☐	5. If the patient gains more than 3 pounds in 48 hours without other heart failure symptoms, they should not be concerned.	☐
☐	6. Swelling of the abdomen may indicate retention of excess fluid due to worsening heart failure.	☐
☐	7. If patients take their medications as directed and follow the suggested lifestyle modifications, their heart failure condition will not return.	☐
☐	8. When patients have aches and pains, aspirin and non-steroidal anti-inflammatory drugs (NSAIDs like ibuprofen) should be recommended.	☐
☐	9. It is OK to use potassium-based salt substitutes (like No-Salt or Salt Sense) to season food.	☐
☐	10. If patients feel thirsty, it is OK to remove fluid limits and allow them to drink.	☐
☐	11. When a patient adds extra pillows at night to relieve shortness of breath, this does not mean that the heart failure condition has worsened.	☐
☐	12. If a patient wakes up at night with difficulty breathing, and the breathing difficulty is relieved by getting out of bed and moving around, this does not mean that the heart failure condition has worsened.	☐
☐	13. Lean deli meats are an acceptable food choice as part of the patient's diet.	☐
☐	14. Once the patient's heart failure symptoms are gone, there is no need for obtaining daily weights.	☐
☐	15. When assessing weight results, today's weight should be compared with the patient's weight from yesterday, not the patient's ideal or dry weight.	☐

*The following 5 statements are signs and symptoms that patients may have. Please mark yes or no to reflect if the p
should notify their heart failure physician of these symptoms:*

Need more Info on subject?		Yes
☐	16. BP recording of 80/56 without any heart failure symptoms.	☐
☐	17. Weight gain of 3 pounds in 5 days without symptoms.	☐
☐	18. Dizziness or lightheadedness when arising that disappears within 5 minutes.	☐
☐	19. New onset or worsening of fatigue.	☐
☐	20. New onset of worsening leg weakness or decreased ability to exercise.	☐

THANK YOU for completing this survey.

APPENDIX D

Demographic Questions

1. What is your level of education?
   a. ADN
   b. BSN or higher
   c. Diploma

2. How long have you been a nurse?
   a. 1-5 years
   b. 6-10 years
   c. >10 years

3. What is your age group?
   a. 20-30 years old
   b. 31-40 years old
   c. >41 years
   d.

4. How comfortable are you with providing Heart Failure patient education?
   a. Very comfortable
   b. Somewhat comfortable
   c. Not comfortable at all

5. Do you hold a medical surgical nursing certification?
   a. Yes
   b. No

APPENDIX E

Recruitment E-mail

Dear colleague,

My name is Nicole P. Ware and I am nursing program manager for clinical ladder and bedside leadership. I am also a DNP student at the University of North Carolina at Charlotte. I am currently working on my final DNP project and am asking for your help in completing my project. My project is designed to examine registered nurses' knowledge of heart failure education. As you may be aware, heart failure is a disease that affects patient quality of life and hospital readmission rates due to disease exacerbation. As a nurse that has worked here for a while you are a large part of our success in reducing readmission by educating patients and novice nurses.

Consent Information

Participation in this project involves completing the *Nurses Knowledge of Heart Failure Education Principles Survey.* The survey is available in Qualtrics and the link can be found below. Completing the survey will take approximately 10 minutes of your time. Participation is completely voluntary and anonymous. Informed consent will be implied by completion of the survey.

There is no risk of physical harm in completing this survey. It is possible that you may feel slight discomfort if you become aware of a lack of knowledge while completing the survey. Know that the survey will be anonymous and results kept confidential. Your choice to participate or not to participate will not have any professional or employment consequences. You have the right to not disclose any information you do not wish to share. Your data will remain confidential and the results will be reported as aggregate. Benefits to participating in the survey include satisfaction of contributing to the growing base of nursing knowledge, providing data to determine learning needs and a gift card.

Contact Information

If you have any questions regarding the project, you can contact me at (919) 470-4294or via email at nicole.ware@duke.edu. You may also want to contact he Principal Investigator Gloria Mc Neil, DNP, MBA, MA, RN, NEA-BC at 3643 North Roxboro Road, Durham, NC, (919) 470-7141 or via email at gloria.mcneil@duke.edu.

Thank you for your time and participation,

Nicole P. Ware, MSN, RN, CNL