

NURSES' KNOWLEDGE OF HEART FAILURE IN A NORTH CAROLINA COMMUNITY  
HOSPITAL

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## ABSTRACT

### ASSESSING NURSES' KNOWLEDGE OF HEART FAILURE IN A NORTH CAROLINA COMMUNITY HOSPITAL

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Heart failure (HF) is an epidemic affecting approximately 5.1 million people in the United States and is one of the most expensive cardiovascular illnesses, costing the nation an estimated \$32 billion each year (CDC, 2013). There is no cure for HF, but following guidelines established by the American Heart Association can contribute to decreased mortality, improved quality of life, and decreased hospital admissions. Nurses play an essential role in providing comprehensive HF self-management education to patients, and thus, should be knowledgeable about HF principles themselves. Research suggests that nurses may not have adequate knowledge of HF management to educate patients, and consequently, are not optimally prepared to provide HF education (Hart, Spiva, & Kimble, 2011).

This was an exploratory, descriptive study with a survey design seeking to describe nurses' knowledge of HF self-management principles within a community hospital in North Carolina. The Nurses' Knowledge of Heart Failure Education Principle questionnaire developed by Dr. Nancy Albert (2002) was utilized to determine which HF education topics nurses were knowledgeable about and which topics they were deficient. Thirty-two registered nurses agreed

to participate, with a mean knowledge score of 15.75 (78.75% correct). Consistent with previous studies, nurses scored lowest on knowledge related to transient dizziness (28.1% correct), asymptomatic hypotension (18.8% correct), daily weight assessment (25% correct), and salt substitutes (53.1% correct). Findings confirm previous work suggesting that nurses may not be adequately prepared to educate patients with HF about self-management.

This aspect of nursing education is important, because nurses caring for HF patients need to have sufficient knowledge of HF self-management principles in order to provide optimal education to patients. Lack of adequate education for HF patients results in noncompliance with outpatient treatment modalities and ultimately leads to hospital readmissions related to HF exacerbation. Nurses with adequate knowledge of HF can provide better education to patients on how to manage their HF, potentially reducing hospital readmission rates related to HF and improving patients' overall quality of health.

## CHAPTER ONE: BACKGROUND AND RATIONALE FOR STUDY

### **Introduction**

Year after year, heart failure (HF) affects and kills an increasingly large number of people. Heart failure is a major public health concern in the United States accounting for more than 1 million hospitalizations and more than 56,000 deaths each year (Yancy, Jessup, Bozkurt, et al., 2013). The economic burden of HF is significant, costing the nation an estimated \$32 billion each year (Center for Disease Control [CDC], 2013). Costs are propagated due to high hospital readmission rates, with approximately 25% of hospitalized patients with HF readmitted within 30 days of discharge (Yancy et al., 2013). Additionally, in 2012, the Centers for Medicare and Medicaid Services (CMS) began the readmissions reduction program, which reduces reimbursement to hospitals due to high 30-day readmission rates (Schell, 2014). As a result, hospitals are challenged with identifying interventions to prevent hospital readmissions for patients with HF to reduce spending and improve health outcomes.

Several research studies support the importance of education programs for patients with HF, indicating an improvement in clinical outcomes for HF patients, including reduction in readmission rates, length of stay, healthcare costs, and improved self-care behavior (Boren, Wakefield, Gunlock, & Wakefield, 2009; Fowler, 2012; Riegel, Moser, Anker, et al., 2009; Sterne, Grossman, Migliardi, & Swallow, 2014). The Joint Commission has mandated that HF education be provided to patients prior to discharge from the hospital. In conjunction with the Joint Commission, the American Heart Association (AHA) and the American College of Cardiology Foundation (ACCF) have set forth guidelines endorsing key components of HF education topics to include diet, activity, medication management, weight monitoring, signs and

symptom recognition and follow-up care (AHA, 2011; Sterne et al., 2014). Patients should receive education regarding these principles to enhance self-care outside of the hospital.

### **Problem Statement**

As nurses are often the primary providers of education in the hospital setting, they should be knowledgeable about essential HF education topics in order to help patients manage their disease. Despite evidence-based guidelines available to nurses about providing the best self-management practices to HF patients, research suggests that nurses may not have adequate knowledge of HF management principles to educate patients, and thus, are not adequately prepared to provide teaching (Hart, Spiva, & Kimble, 2011). Understanding more clearly the competence that nurses possess for teaching patients this crucial information may help identify a need for staff education.

### **Purpose**

The purpose of this study was to determine the extent of nurses' knowledge of the major heart failure educational guidelines in a small community hospital in North Carolina.

### **Research Questions**

The research questions for this study were:

- 1) What is the extent of nurses' knowledge of heart failure education topics as measured by the Nurses' Knowledge of Heart Failure survey instrument?
- 2) Is there a correlation between years of nursing experience and knowledge of HF guidelines?
- 3) Is there a correlation between educational preparation and knowledge of HF guidelines?
- 4) Is there a correlation between nursing unit and knowledge of HF guidelines?

## **Contributions of the Study**

The results of this study will help provide insight into how well nurses are informed of the heart failure education guidelines in a North Carolina community hospital. The primary goal of this study is to identify a potential need for nursing education to better instruct HF patients and ultimately improve health outcomes. Not-for-profit hospitals, such as the one in this study, often struggle with limited resources and may be at a disadvantage in implementing strategies to reduce readmissions for HF. Ensuring that nurses in this hospital are sufficiently knowledgeable to provide education to HF patients could improve quality of care and reduce spending related to multiple readmissions.

At the time of this study, the subject hospital is undergoing preparation for Advanced Certification in Heart Failure, accredited by The Joint Commission. Advanced Certification in Heart Failure requires that a program collect data on standardized performance measures and use this information for ongoing performance improvement efforts. Information gained from this study could potentially be used to determine necessary areas for continued education of nurses, and to improve adherence to performance measures mandated by AHA and The Joint Commission.

Many studies have been completed examining nurses' knowledge of HF education topics, and the literature suggests nurses may not be knowledgeable in HF self-management principles and behaviors (Albert, Collier, Sumodi, et al., 2002; Delaney, Apostolidis, Lachapelle, & Fortinsky, 2011; Fowler, 2012; Goodlin, Trupp, Bernhardt, Grady, & Dracup, 2007; Hart, Spiva, & Kimble, 2011; Kalowes, Peters, Long, Hawkins, Wayne, Catipon, & Tin, 2011; Mahramus, Penoyer, Sole, Wilson, Chamberlain, & Warrington, 2013; Washburn, Hornberger, Klutman, & Skinner, 2005; Willette, Surrells, Davis, & Bush, 2007). The authors have examined nurses in a

range of healthcare settings from tertiary teaching hospitals to community health. Few studies have examined nurse characteristics in relation to extent of knowledge of HF guidelines. This study looked at years of experience, educational preparation, and critical care versus non-critical care specialty areas in relation to knowledge of HF guidelines.

### **Theoretical Framework**

Albert Bandura's self-efficacy theory has been frequently used in nursing literature discussions of adherence to health practices in adaption to chronic illness. Bandura (1994) states that "perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (pg. 71). The concept of self-efficacy implies that people are most likely to engage in a certain activity if they perceive they will be competent at the activity. This is a cognitive mechanism that mediates behavior, influences participation in various activities and determines the amount of motivation and persistence in pursuing the activity (Du, Everett, Newton, Salamonson, & Davidson, 2011). According to Bandura (1994), people with a strong sense of self-efficacy are more likely to view difficult tasks as something to be mastered. Self-efficacy has influence over people's ability to learn, their motivation and their performance, as people will often attempt to learn and perform only those tasks for which they believe they will be successful (Lunenburg, 2011).

Bandura's theory can be used as a framework to describe the strength of an individual's perception of self-efficacy as it relates to the nurse as an educator. Often, self-efficacy is applied in nursing research to learn which factors enhance patients' adherence to self-care behaviors. However, it is equally important for nurse educators to have a strong sense of self-efficacy in providing effective HF education. Research has shown that personal mastery strengthens self-

perceptions of efficacy and can influence one's capabilities to carry out a certain behavior and improve outcomes (Albert et al., 2002). Nurses who are confident in their abilities to provide adequate HF education will be more successful in helping patients learn to manage the disease. Theoretically, the nurse with a high level of self-efficacy will strive to avoid placing HF patients in a situation where they are likely to fail, and as such, should increase their determination to provide excellent education.

Albert et al. (2002) applied Bandura's self-efficacy theory in a study examining nurses' knowledge of HF education principles. As nurses gain mastery of the information, they may be more willing to provide HF education; and, if these nurses are knowledgeable regarding HF education principles, then the education provided by them will be better than those who lack self-efficacy (Albert et al., 2002). The researchers asserted that prior to developing interventions that improve mastery in HF patient education, the level of nurse understanding of HF education principles must first be determined (Albert et al., 2002).

### **Assumptions**

It was assumed that during this research study nurses would answer the "Nurse's Knowledge of Heart Failure Survey" independently, only once, and to the best of their ability. It was also assumed that nurses would not collaborate with others or research answers by use of external resources. Finally, it was assumed that nurses would answer the demographical questions on the survey honestly.

### **Definition of Terms**

**Heart failure.** Heart failure is a life-threatening condition in which the heart cannot adequately pump blood throughout the body or is unable to prevent blood from "backing up" into the lungs. It is a complex syndrome that is diagnosed by presenting symptoms and through

diagnostic testing. Classic symptoms of HF include fatigue, shortness of breath, and edema (Heart Failure Society of America [HFSA], 2010). As there is no cure for HF, treatment is aimed at preventing hospitalizations related to heart failure exacerbations, relieving symptoms, and improving quality of life.

**Heart failure guidelines.** The care and education of patients with HF is based largely on core measures that were developed by The Joint Commission and guidelines from the AHA/ACCF. As previously mentioned, The Joint Commission has developed and implemented performance measures, one of which is that HF patients who are discharged home receive instructions before discharge addressing key components for self-management of HF (The Joint Commission, 2010). The Joint Commission's core measures and the latest ACCF/AHA and HFSA management guidelines recommend that education should address recommended activity level, diet, discharge medications, follow-up appointments, weight monitoring, and actions to take if symptoms worsen (HFSA, 2010; The Joint Commission, 2010; Yancy et al., 2013). Data gathered in preparing these national guidelines indicated that patients receiving education in all six categories of the HF core measures were significantly less likely to be readmitted for any cause (Yancy et al., 2013).

**Activity level.** The AHA (2011) endorses following exercise recommendations as an important factor in reducing readmissions and to improve ambulatory status. Activity instructions should include the type of exercise or activity the individual should complete, how to carry out the activity, how long the activity is appropriate to carry out, and what physiological changes can be expected with exercise (AHA, 2011). Physical activity recommendations for individuals with HF are to progress to 30 minutes of moderate activity most days of the week

(Du et al., 2011). These activities can be accomplished in a single session or accumulated in multiple sessions (Du et al., 2011).

**Diet.** Dietary instructions for HF patients include adhering to a low-sodium diet, and at times, fluid restrictions. Foods high in sodium make the body retain fluid, resulting in fluid overload and increased workload on the heart; commonly evidenced by edema, hypertension, weight gain, and dyspnea. The HFSA (2010) recommends limiting sodium intake to less than 2000 mg per day and limiting fluid intake to less than 2 L per day. Patients with HF should be counseled on how to read food labels and identify sodium content per serving, as well as strategies to maintain a low-sodium diet when eating away from home (AHA, 2011).

**Discharge medications.** There are several specific pharmacologic interventions utilized in the treatment of HF; specifically, diuretics, beta blockers, angiotensin-converting enzyme inhibitors, angiotensin-receptor blockers, and nitrates (Paul & Hice, 2014). Nurses caring for HF patients should be knowledgeable of these medications and their effects in treating HF. Patients require guidance on how to adhere to a medication regimen, as noncompliance can rapidly and adversely affect the HF patient's condition (AHA, 2011).

**Follow-up appointment.** Follow-up appointment for HF patients is important in reducing risk of readmission and improving quality of life, even if the patient is asymptomatic (AHA, 2011). The HFSA recommends that prior to discharge, a patient be scheduled for a follow-up appointment within 7-10 days of discharge from the hospital (HFSA, 2010).

**Weight monitoring.** Weight gain is often an initial sign indicating fluid volume overload in patients with HF, and if weight gain is treated promptly, HF exacerbations can be prevented. One important component of HF education is teaching patients to weigh themselves daily and

recording this measurement in order to recognize signs of fluid volume overload. A weight gain of 3 pounds within twenty-four hours is significant and can mean that the HF is worsening.

**Worsening symptoms.** Patients with heart failure should be educated on signs and symptoms indicating worsening HF and the appropriate actions to take when symptoms occur. Signs and symptoms of worsening heart failure include sudden weight gain, increasing shortness of breath while at rest, increased swelling of the lower extremities, swelling or pain in the abdomen, transient dizziness, asymptomatic hypotension, awakening at night short of breath, increasing and frequent cough, loss of appetite, or increasing fatigue. Actions may include adjusting diuretics as needed or contacting the physician (AHA, 2011).

### **Summary**

As discussed, HF afflicts millions of people in this country alone, and places a significant burden on the healthcare system. Additionally, there is a large decrease in quality of life for patients who are living with heart failure due to hospital readmission rates and harmful symptoms related to heart failure. This chapter discusses the need for accurate patient understanding of heart failure in order to optimize outcomes for patients with heart failure. Understanding that nurses play a key role in the education of patients with heart failure, this chapter has emphasized the need for quality research to examine nurses' true understanding of heart failure patient education concepts. Finally, this chapter has also provided some background on common topics related to heart failure that are taught to all patients on a nationwide level.

## CHAPTER TWO: REVIEW OF THE LITERATURE

A literature search was conducted utilizing CINAHL, and PubMed databases. Search terms included *heart failure*, *heart failure self-management*, *nurses' knowledge of heart failure*, *heart failure education*, *heart failure discharge instructions*, and *heart failure guidelines*. Additional information was obtained from journal articles cited as references on the initial articles retrieved from the database search, as well as educational websites such as The Joint Commission, the CDC, AHA, and HFSA. The articles chosen were ones that focused on the previously mentioned topics, had a population that did not consist of pediatrics or neonates, and discussed the nurse's role in heart failure education. The majority of the information attained was published less than ten years prior.

### **Significance of Heart Failure**

Heart failure is a complex clinical syndrome that is irreversible and primarily affects older populations. An estimated 5.7 million people in the United States are living with heart failure, with an additional 870,000 new cases each year (Mozaffarian, Benjamin, Go, et al., 2015). Recent data projects the prevalence of HF will increase 46% from 2012 to 2030, resulting in more than 8 million people with HF, primarily related to the aging population (Mozaffarian et al., 2015). Heart failure is now considered to be at epidemic proportions in people greater than 65 years of age (Roger, 2013). Survival after HF diagnosis has improved over time, although the death rate remains high, with 50% of HF patients estimated to die within five years of diagnosis (Mozaffarian et al., 2015). Even with improvements in detection and therapy, HF remains a high-prevalence and high-cost condition. In 2012, total cost for HF was estimated to be \$30.7 billion. Of this total, 68% was attributed to direct medical costs. Projections show that by 2030, the total

cost of HF will increase almost 12% to \$69.7 billion from 2012 (Mozaffarian et al., 2015). These statistics underscore the need for quality care for all patients who are diagnosed with heart failure, as well as highlight the economic burden that will continue to plague the United States should effective means of managing HF not be established.

### **Nurse as Educator**

A multidisciplinary approach to patient education has been advocated by the Agency for Healthcare Research and Quality (AHRQ), the ACCF and the AHA (Washburn & Hornberger, 2008). Such an approach to the management of HF that incorporates the coordinated efforts of a team of nurses, physicians, pharmacists, social workers, nutritionists, and physical therapists has been shown to reduce costs, length of hospital stay, and readmission rates associated with the disease (Albert et al., 2002; Paul and Hice, 2014; Schell, 2014; Washburn & Hornberger, 2008). Nurses are an integral part of the multidisciplinary team and are often the primary providers of patient education in the healthcare setting. As previously discussed, one of the standard performance measures implemented by The Joint Commission includes providing written instructions or educational materials to HF patients prior to discharge. To meet the performance measure, documentation that education was provided addressing the heart failure guidelines must be included in the patient's record (Washburn & Hornberger, 2008). This is the responsibility of the nursing staff providing care for the patient. Ultimately, if nurses are to provide education to patients with HF, they must understand the principles of HF management and be knowledgeable of the HF guidelines.

### **Heart Failure Education**

Treatment for this irreversible disease is aimed at symptom relief, improving quality of life, and preventing repeated hospitalizations. Heart failure requires patients' daily self-

management at home, but disease management is challenging and patients often experience acute exacerbation of symptoms resulting in hospitalization (Sterne et al., 2010). Given the chronic nature of HF, patients must be counseled on the necessary skills to perform self-management behaviors to optimize quality of life (Hart, Spivey, & Kimble, 2011). Numerous studies have shown that patient education programs improve clinical outcomes for HF patients, including treatment adherence, time to hospitalization and hospital length of stay. A literature review by Schell (2014) analyzing 50 articles cited improved discharge education as a factor in reducing readmissions for HF. One such study by Koelling, Johnson, Cody, & Aaronson (2005) was performed with 223 HF patients comparing the effects of a 1-hour teaching session with a nurse educator to the usual discharge process. Standard discharge information included written instructions on diet, daily weights, activity, and follow-up appointments. A telephone follow-up was done at 30, 90, and 180 days post-discharge. The researcher then determined the number of days re-hospitalized or the mortality rate within the 180 days of follow-up, finding that readmissions and deaths were significantly lower in the education group than for the control group.

Similarly, a systematic review by Boren et al. (2009) examined 35 studies and randomized controlled trials focusing on patient education programs to identify educational content that leads to successful patient self-management and improved HF outcomes. The authors found that the most frequent educator was a nurse. The teaching method was primarily verbal, supplemented by written materials. Overall, 20 teaching topics were identified, with the most common topics including a review of medications and side-effects, and symptom monitoring and management. For outcome measures, knowledge and behaviors, improved in

most of the studies that measured them, supporting the benefit of an education program (Boren et al., 2009).

### **Nurses' Knowledge of Heart Failure**

There is limited research measuring nurses' knowledge of heart failure education principles taught to patients, and even less research investigating which, if any, factors contribute to the level of nurses' knowledge of heart failure principles. However, the evidence available consistently indicates that nurses may not have adequate knowledge of HF education principles, and are therefore ill prepared to provide education to HF patients. All of the research reviewed for this study utilized the *Nurses' Knowledge of Heart Failure Principles Survey*, developed by Dr. Albert (2002).

A study by Albert and colleagues (2002) assessed the extent of HF knowledge of 300 nurses in a large healthcare system that included a university-based hospital, community hospitals, hospice and home care. Nurses were surveyed using the *Nurses' Knowledge in Heart Failure Education Principles Survey*. Researchers found that nurses who primarily care for patients with HF had higher scores than floor and critical care nurses. Also, home care nurses scored higher than hospital or palliative care nurses. Similar research by Washburn et al. (2005) used the same survey in a small community hospital, where a sample of 51 nurses had an average score of 73%, less than the passing score of 87.5%, as was determined by the authors of the instrument. Heart failure education topics that were frequently missed included medications, weight assessment, use of salt substitutes, physician notification of asymptomatic blood pressure, and dizziness when rising. Results suggested nurses may not have sufficient knowledge in HF to facilitate patient education.

Studies by Willette and associates (2007) and Kalowes et al. (2011) held comparable results. Participants' scores using the *Nurses' Knowledge in Heart Failure Education Principles Survey* were similar to those found in previous studies. Willette et al. (2007) determined that although study subjects regularly provided care to HF patients, overall scores indicated that nurses were inadequately prepared to educate patients regarding HF self-management techniques. Findings by Kalowes et al. (2011) align with previous research, suggesting common topics in which nurses lack knowledge include weight assessment, blood pressure recordings, and transient dizziness when rising. There was no statistical difference in nurses' test scores between the telemetry unit and the medicine unit. A study by Hart, Spiva, & Kimble (2011) used a Likert scored version of the survey tool used in previous research. Consistent with other findings, nurses were least knowledgeable about daily weights, asymptomatic hypotension, and managing transitory dizziness.

A study by Delaney et al. (2011) evaluated home care nurses' knowledge of education topics in managing HF. The *Nurses' Knowledge in Heart Failure Education Principles Survey* was administered to 94 home care nurses, with scores demonstrating a 78.9% knowledge level in general HF education topics; once again lower than the determine passing score. Participants' mean score on HF self-management knowledge was similar to previous research by Albert and colleagues, Washburn and colleagues, and Kalowes et al. (76%, 73%, and 74%, respectively). With overall scores below 87.5%, findings consistently indicate these nurse are inadequately prepared to deliver HF education to patients.

### **Summary**

As discussed in this chapter, the literature surrounding heart failure education emphasizes the importance of nurses' ability to understand important heart failure guidelines. Research

indicates that discharge education is effective in improving adherence to prescribed treatments and in reducing repeated hospital admissions. Nurses are the primary educators in most hospitals and are uniquely situated to educate patients on how to effectively manage their heart failure at home. However, the literature suggests that nurses lack adequate knowledge to properly educate patients on HF principles. If patients are not sufficiently educated, it is unrealistic to expect them to practice self-management outside of the hospital. It is essential that every attempt be made to correct the knowledge gap that has been identified relating to nurses' understanding of heart failure principles.

## CHAPTER THREE: RESEARCH METHODOLOGY

This chapter describes the research methodology that was used during the investigation of nurses' knowledge of heart failure principles. The basic design of the study is described, as well as the setting of the research and the sample. Ethical considerations are addressed. The instruments are described, as well as how these instruments were used to collect data. Methods for data collection are provided, and limitations are discussed.

### **Design**

The purpose of this study was to examine the extent of nurses' knowledge of heart failure education guidelines. The researcher also sought to determine if certain variables, such as years of experience, area of employment, and educational background were associated with nurses' knowledge of HF self-management principles. An exploratory, descriptive study with a survey design was chosen to assess hospital nurses who work in a North Carolina community hospital. Descriptive research describes data and characteristics about the population being studied. It is used to obtain information about the current state of a situation. Exploratory research is often useful for subjects where there is little existing information. Previous research has indicated that nurses' do exhibit a lack of understanding of certain heart failure topics, preventing them from adequately providing necessary patient education. Few studies have sought to determine which, if any, factors contribute to the level of nurses' knowledge of heart failure principles. The chosen research design employed a validated survey tool to measure nurses' current knowledge of HF topics in a particular hospital. Results could potentially influence future directions of staff education, and ultimately improve patient outcomes.

## **Setting**

Data was collected over a 2-week timeframe in the spring of 2015 from nurses employed with a small community hospital in North Carolina. The survey tool was administered to all nurses working on all units of the hospital, as well as affiliated outpatient clinics. Potential inpatient units responding include the Emergency Department, Medical/Telemetry unit, Orthopedic, Surgical, Intermediate Care and Intensive Care units. These units see varying volumes of patients with heart failure throughout the year. The organization has been preparing for Advanced Certification in Heart Failure accredited by the Joint Commission, and it is associated with an outpatient heart failure clinic. These factors may influence subjects' participation within the hospital.

## **Sample**

The target population included all registered nurses employed with the hospital at the time the survey was launched. The goal sample size was 50 participants, based on the consideration of the number of potential nurse participants. A convenience sample of 32 nurses participated in the study. Subjects were recruited electronically through the intrahospital e-mail network. They were automatically enrolled in the study after consenting and completing the survey. Exclusion criteria included any staff not licensed as a registered nurse.

## **Ethical Considerations**

Study approval was received from the Western Carolina University International Review Board on February 11, 2015 (Appendix A). Approval of research was also obtained by the Catawba Valley Medical Center IRB (Appendix A). Security of research participants' data was ensured by the use of a password-protected Survey Gizmo account by the primary investigator. Subjects were informed that participation in the study was completely voluntary. Informed

consent was obtained by agreement to participate and through submission of a completed survey. An initial e-mail was sent to all nurses explaining the intent and procedures of the study, with a link to the electronic survey included. Participants accessed the survey by clicking a link, taking them to the informed consent page (Appendix B). Participants consented by checking a box marked “I agree” or “I do not agree”. If they clicked “I agree”, the questionnaire continued. If “I do not agree” was selected the survey was automatically closed. Foreseeable risks in relation to the entire research project included an inadvertent breach in confidentiality. To minimize risks, survey responses were kept anonymous.

### **Instrument**

A review of the literature revealed an existing instrument which has been used to assess nurses’ knowledge of heart failure guidelines in previous studies. The *Nurses’ Knowledge of Heart Failure Education Principles Survey*, designed by Albert and colleagues (2002), is a 20-item true/false survey on HF management principles (Appendix C). Questions on each topic include self-management of diet (3 questions), fluid or weight monitoring (7 questions), signs and symptoms of worsening heart failure (6 questions), medications (2 questions), and exercise (2 questions). Written permission to use the survey was obtained before the study (Appendix D); and additional demographic questions were added to the original questionnaire such as unit of employment, years of nursing experience, and educational preparation. Validity and reliability of the instrument has been previously established. Face and content validity were tested by Albert and colleagues (2002) using a panel of experts in HF and patient educators, resulting in 100% test-retest reliability. The overall true score for the construct, nurses’ knowledge of HF education principles, was expected to be 87.5% or greater (Albert et al., 2002). Subsequent use of the

survey instrument further tested reliability (Washburn et al., 2005; Willette et al., 2007; Kalowes et al., 2011).

### **Data Collection Procedures**

Nurses were invited to participate in the research project by a recruitment e-mail sent through the hospital intranet describing the intent of the study, along with the link to access the online questionnaire (Appendix E). Participants were asked to complete the survey within two weeks, with an e-mail reminder sent after the first week. Once the questionnaire was submitted, results were automatically made available to the researcher with all participant data de-identified. After surveys were returned, all data was saved onto a separate flash drive and stored in a locked file cabinet. Any subsequent information or questionnaires left on the computer or in e-mails was deleted.

### **Data Analysis**

The survey data was analyzed using descriptive statistics in Survey Gizmo. To determine nurses' overall knowledge of heart failure education topics, the mean score of all nurses' total correct responses was calculated. The overall mean correct score was determined for demographic category, including years of nursing, employment area, and educational preparation. Relevant variables were measured using a student t-test to analyze relationships and correlations. The percentage of correct answers of each question was also calculated to identify areas of knowledge deficiency.

### **Limitations**

The major limitations of this study included the potential for nurses to use outside resources, such as the internet, to determine the correct answers on the questionnaire.

It was also a possibility that nurses worked together to choose correct survey answers, which could have skewed results. Another limitation is the survey was administered by e-mail through the hospital intranet. If nurses do not check their e-mails regularly or do not feel comfortable accessing the survey online, this could have decreased participation. Finally, as participation in this study was voluntary, it is possible that nurses who felt they may score poorly on the survey chose not to participate, which could have affected mean scores and may not reflect the true knowledge of nurses on average.

### **Summary**

This chapter provided a summary of the research methods, including the design of the study, as well as a description of the setting and sample. Ethical considerations and human protection procedures were addressed. An overview of the research instrument was provided, as well as how this instrument was implemented to collect data, and how the collected data was analyzed. Finally, limitations to the research were explored.

## CHAPTER FOUR: RESULTS

### **Description of Sample**

There were 447 surveys sent to all registered nurses employed within the hospital network. This included nurses working throughout the hospital in any department, as well as nurses employed in the affiliated outpatient clinics. The survey was available for two weeks, with a reminder email sent to nurses after the first week. A total of 32 registered nurses participated in the research, yielding a 7% response rate. Of the 32 participants, 4 (12.5%) classified themselves as emergency department nurses, 4 (12.5%) participants selected critical care for their area of nursing, and 24 (75%) chose “other” as their selected area of nursing (Table 1). Years of experience resulted in 5 (15.6%) nurses having 1-3 years of experience, 8 (25%) nurses with 4-10 years of experience, and 19 (59.4%) nurses having greater than ten years of experience (Table 1). All subjects were registered nurses, with 8 (25%) participants prepared at the associate degree level, 18 (56.25%) prepared at the baccalaureate level, and 6 (18.75%) at the master’s degree level (Table 1). Finally, the majority of respondents (n = 26, 81.3%) had not received prior continuing education on heart failure after January 2014 (Table 1).

Table 1. Respondent Demographics

<b>Variable</b>	<b>N (%)</b>
<i>Area of Employment</i>	
Emergency Department	4 (12.5%)
Critical Care	4 (12.5%)
Other	24 (75%)
<i>Years of Experience</i>	
1-3 years	5 (15.6%)
4-10 years	8 (25%)
> 10 years	19 (59.4%)
<i>Education Level</i>	
A.D.N	8 (25%)
BSN	18 (56.25%)
MSN	6 (16.75%)
<i>Received prior HF education</i>	
Yes	6 (18.8%)
No	26 (81.3%)

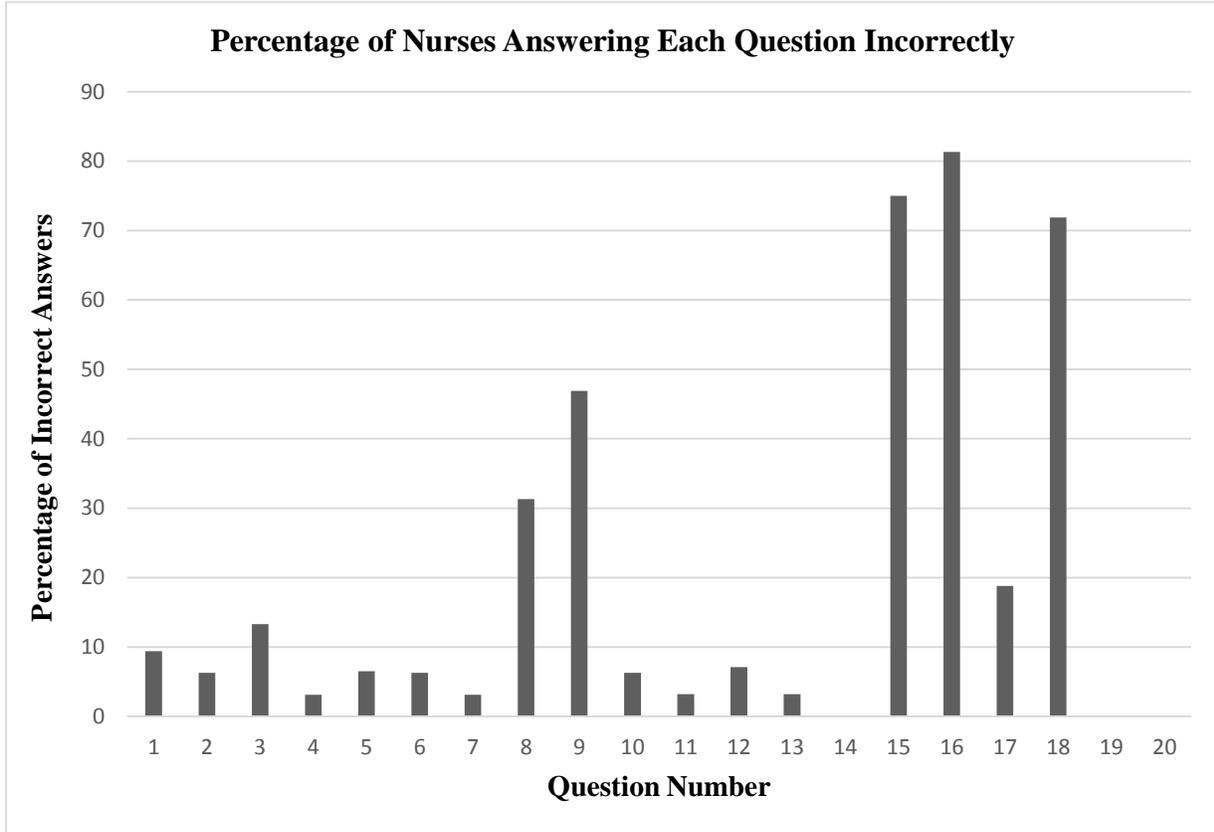
### **Data Analysis and Findings**

**Research Question 1.** What is the extent of nurses' knowledge of heart failure education topics as measured by the Nurses' Knowledge of Heart Failure survey instrument?

Of the 32 participants, 26 answered all twenty survey questions, and 6 subjects left 1-4 questions unanswered. After communicating with Dr. Albert, the author of the instrument, it was decided to count unanswered questions as incorrect when scoring surveys. The reason, per Dr. Albert, being that if a respondent did not answer a survey question, it was likely they did not know the correct response. Descriptive statistics were used to describe the survey results. The mean total score for the entire group was 15.75 ( $\pm$  1.78) or 78.75% correct, reflecting a below-average overall knowledge base. No respondent achieved a perfect score of 100% on the questionnaire, and the average scores ranged from 65% to 95% correct.

To determine content areas in which nurses may lack knowledge, the frequency of correct responses for individual questions was determined. Out of the 20 survey questions, three questions had a 100% correct response from all participants (Items #14, 19, and 20). More than half of the survey questions were answered correctly by at least 90% of nurses. However, 4 questions proved difficult for participants, with a correct response rate of < 60%. Question 9, “It is OK to use potassium-based salt substitutes to season food” yielded 15 incorrect responses of “true”, with an incorrect response rate of 46.9%. Question 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” resulted in an incorrect response rate of 75%, with 24 nurses incorrectly responding “true”. Question 16, “Notify the physician for BP recording of 80/56 without any heart failure symptoms” was the lowest scoring question, with 26 nurses incorrectly responding ‘yes’, resulting in an incorrect response rate of 81.3%. Question 18, “Notify the physician for dizziness or lightheadedness when arising that disappears within 5 minutes” was incorrectly answered “yes” by 23 nurses, yielding an incorrect response rate of 71.9% (Figure 1).

Figure 1. Percentage of Nurses Answering Each Question Incorrectly



**Research Question 2.** Is there a correlation between years of nursing experience and knowledge of HF guidelines?

Table 2 shows there was little difference in the average scores for nurses of varying years of experience. Nurses with 3 or less years of experience ( $n = 5$ ) scored slightly lower than the other groups, with a mean score of 15.4 (77%,  $\pm 1.67$ ). There were 8 nurses with 4-10 years of experience, averaging a score of 16 (80%,  $\pm 1.31$ ). The majority of nurses ( $n = 19$ ) had greater than 10 years of experience and averaged a score of 15.74 (78.7%,  $\pm 2.02$ ). Due to the small group sizes, the nurses were further grouped into two categories: those that had 9 or less years of experience and those that had 10 or more years of experience. A student t-test was then used to

compare these two groups ( $\bar{x} = 15.77$  and  $\bar{x} = 15.74$ , respectively), which showed no statistical significance between the nurses in each group regarding overall correct survey responses ( $t = 0.050$ ,  $p = 0.961$ ) at a 0.5 level of significance.

*Table 2. Mean Scores for Nursing Groups*

<b>Variable</b>	<b>N</b>	<b>Mean Score (%)</b>
<i>Area of Employment</i>		
Emergency Department	4	15.75 (78.75%)
Critical Care	4	17 (85%)
Other	24	15.54 (77.7%)
<i>Years of Experience</i>		
1-3 years	5	15.4 (77%)
4-10 years	8	16 (80%)
> 10 years	19	15.74 (78.7%)
<i>Education Level</i>		
A.D.N	8	15.5 (66.5%)
BSN	18	15.83 (79.15%)
MSN	6	15.83 (79.15%)
<i>Received prior HF education</i>		
Yes	6	16.67 (83.35%)
No	26	15.75 (78.75%)

**Research Question 3.** Is there a correlation between educational preparation and knowledge of HF guidelines?

Of the nurses responding, 8 had an associate's degree in nursing and 6 had a master's degree, while the majority of respondents had a baccalaureate degree in nursing (n = 18). Table 2 indicates there is a narrow difference in the total average scores for nurses at each educational level, however it is noted that respondents with a bachelor's or master's degree scored slightly higher than nurses at the associate's degree level ( $\bar{x} = 15.83$  and  $\bar{x} = 15.5$ ). A student t-test was used to determine statistical significance between nurses with an associate level of education and those with a bachelor's or master's degree ( $\bar{x} = 15.5$  and  $\bar{x} = 15.83$ , respectively). No statistical significance was found between the two groups regarding educational level in overall mean score (t = 0.454, p = 0.654) at a 0.05 level of significance).

**Research Questions 4.** Is there a correlation between unit of nursing and knowledge of HF guidelines?

Due to a small number of participants from each individual unit, a relationship was unable to be determined. A student t-test was used to compare nurses working in the emergency department and critical care with nurses working in "other" areas. Combined, nurses in the emergency department and critical care had an average total score of 16.38, which was greater than nurses in the "other" areas, with an average total score of 15.54 (Table 2). The student t-test showed no statistical significance between the two groups in their overall correct responses (t = 1.54, p = 0.26) at a 0.05 level of significance.

Finally, although not examined as a research question, subjects were asked if they had received prior HF education since January 2014, of which only 6 answered yes. Table 2 shows that nurses who had received recent HF education had a higher mean score than those who did

not have prior education ( $\bar{x} = 16.67$  and  $\bar{x} = 15.54$ , respectively). There was no statistical significance found using a student t-test ( $t = 1.424$ ,  $p = 0.165$ ) at a 0.05 level of significance. With a larger sample size it would be useful to explore the correlation between education and level of knowledge through the implementation of an educational intervention. This may provide a basis for future research.

## CHAPTER FIVE: DISCUSSION AND CONCLUSIONS

### **Discussion**

The main purpose of this study was to describe nurses' knowledge of basic HF self-management principles in a community hospital in North Carolina. The mean score of nurses' knowledge in this study (15.75, 78.75%) was below the passing score of 87.5%, according to instrument developers. The findings from this study are similar to previous research, indicating that nurses were not sufficiently knowledgeable about heart failure education principles.

Although no statistical significance was found in the correlation of various demographic qualities and the extent of nurses' knowledge, it is interesting to note the differences in overall scores between the variables. Nurses working in the critical care, nurses with at least a bachelor's degree, and nurses with at least 4 years of experience scored higher overall in the respective categories. Additionally the participants who reported receiving prior heart failure education scored higher than those who did not. The absence of statistical significance can be attributed to a small sample size; thus, it would be beneficial to examine the correlation to extent of nurses' knowledge with a larger sample population.

No participant answered all twenty survey questions correctly, but there were three questions that were answered correctly by 100% of participants. These nurses are aware of the need to obtain daily weights despite absence of HF symptoms (Item # 14), and to notify the physician of new onset or worsening fatigue and leg weakness (Items #19 and #20), as evidenced by 100% correct response rates. As indicated in chapter 4, questions 9, 15, 16, and 18 yielded the most incorrect responses, identifying gaps in nurses' knowledge, particularly regarding salt substitutes, daily weight monitoring, asymptomatic hypotension, and transient dizziness.

A lack of knowledge regarding the use of potassium-based salt substitutes was identified, with 46.9% of participants answering the question incorrectly. A primary aspect of heart failure education involves informing patients of the intricacies of a low-sodium diet. Reducing sodium intake can prevent fluid overload and symptoms of exacerbation. It is also important for patients to understand ways to season food without the use of salt and specific salt substitutes. Many salt substitutes are potassium-based, which can be problematic for many heart failure patients who have high serum potassium levels from using angiotensin-converting enzyme (ACE) inhibitors, angiotensin-receptor blockers, or aldosterone inhibitors (Washburn & Hornberger, 2008). Many heart failure patients are prescribed diuretics and may be on a potassium supplement as part of their medication regimen. The participants in this study require further education to adequately educate patients with heart failure regarding the significance of using potassium-based salt substitutes.

Monitoring daily weights is an essential aspect of care for patients with heart failure and is highlighted by the AHA as a target HF education topic for patients. However, the majority of participants (75%) did not understand the importance of assessing a patient's daily weight by comparing it to their dry weight as opposed to the previous day's weight. This is a disturbing result because weight gain due to fluid retention is a common symptom indicating heart failure exacerbation leading to hospitalization. Dry weight reflects a euvolemic state and should be used when comparing daily weights. However, nurses in the hospital are generally trained to focus on daily weights in a patient's acute state; or, often, they do not know a baseline weight. Although the nurses in this study understand the importance of obtaining daily weights, they lack sufficient understanding of how to assess daily weight measurements by comparing it to a patient's dry

weight. Nurses caring for patients with heart failure must be able to provide clear instruction about this essential component of self-management.

The question pertaining to notifying the physician for asymptomatic hypotension (Item #16) resulted in 81.3% of participants incorrectly responding “true”. Nurses’ misunderstanding of this topic may be due to a lack of understanding of heart failure pathophysiology and the usual hospital practice of notifying a physician of blood pressures below certain parameters. These nurses do not realize that a low asymptomatic systolic blood pressure, such as 80 mmHg, reflects a decreased workload of the heart and is an acceptable therapeutic reading (Albert et al., 2002). A gap in knowledge regarding this aspect of care could result in misguided education for patients with heart failure, who may be instructed to withhold medications for hypotension regardless of symptoms.

Item #18 questioned if a patient should notify their physician for dizziness on arising that disappears within 5 minutes, for which the answer “false” was correctly answered by only 28.1% of nurses. This low scoring result is surprising because common HF medications frequently cause dizziness or lightheadedness. Of note, Dr. Albert updated the survey tool in 2012, revising this particular item. Previously, the question addressed notifying the physician for transient dizziness that disappears within 15 minutes, instead of 5 minutes as indicated on the current version. Research published since the revision maintains a high incorrect response rate to this question, including the results of this study. While there are no guidelines focused on the allowable length of time for patients to feel dizziness, nurses should realize that this is an acceptable occurrence, so long as no other symptoms accompany it. It might also be helpful to add an additional survey question that clarifies if the nurse has the knowledge but is reading the question wrong, or just does not know the correct answer.

## **Limitations**

Study limitations include the small sample size at a single institution, thus, results are not generalizable to other hospitals and nurses caring for heart failure patients. Specific unit identification was not assessed, other than the emergency department and critical care, as a means to protect anonymity of participants. The survey was sent to all nurses employed within this community hospital network, including nurses working in affiliated outpatient clinics. Patients with heart failure are encountered in a variety of settings, and it is important for nurses in all areas to be able to provide adequate education to help patients manage their HF. In retrospect, it would have been beneficial to assess the level of nurses' interaction with HF patients, as heart failure is not always a primary diagnosis for patients. Furthermore, cardiac-focused units will likely encounter HF patients more frequently. Assessing whether participants commonly care for HF patients could have provided more insight on nurses' knowledge of HF education topics.

Another limitation was the low response rate. There are a few reasons this could be attributed to. The first is that the survey was sent via e-mail through the hospital intranet. For nurses to participate in the study, they would have to take time during their shift to log into their employee e-mail account, access the electronic survey and complete the questionnaire. As the survey was sent over the intranet, it was assumed that all participants would check their e-mail. It is possible that some individuals do not access the e-mail the survey was sent to, and if so, were unaware of the study entirely. Also, the short time frame of two weeks did not allow sufficient response time. If the study were to be repeated, it would be best to lengthen availability of the survey to nurses, with periodic reminders of the study's deadline.

Additionally, conditions under which nurses took the survey were not controlled, and participants could have collaborated with each other, or used outside resources while completing the survey. Scores would then be a false representation of nurses' knowledge of HF guidelines. Finally, as participation in this study was voluntary, it is possible that nurses who feel they may have done poorly on the survey chose not to participate, which could have further affected mean scores and may not have reflected the true knowledge of nurses.

### **Implications for Research and Practice**

Educating patients is an essential responsibility across all continuums of nursing, and thus, nurses must be able to provide knowledgeable instructions if patients are to independently manage their HF at home. Results of this study demonstrate that nurses working in a small North Carolina community hospital may not be sufficiently educated in HF self-management principles. Findings have identified knowledge gaps that should provide an opportunity for staff education to better prepare nurses in these areas. It could be beneficial to develop unit-specific training for nurses that focus on this particular patient population. More research is needed to determine if continuing education interventions for nurses on important HF topics would minimize this knowledge deficit. Determining effective interventions to educate nurses should be another focus of future research to guarantee an optimal level of skills acquisition. Potential strategies include utilizing advanced practice nurses specialized in heart failure to provide education programs for staff and providing resources that allow nurses to remain up-to-date with HF education. Additional studies to be considered could also assess nurses' perceived level of self-efficacy. As previously discussed, nurses with a strong sense of self-efficacy are confident in their abilities to provide adequate HF education and will be more successful in helping patients learn to manage their disease.

## **Conclusion**

Heart failure is a complex, chronic illness afflicting millions of people and placing a costly burden on the healthcare system. Non-adherence to prescribed self-management principles leads to decreased quality of life for patients, related to harmful symptoms and multiple hospital readmissions. Nurses play a key role in counseling patients, in and out of the hospital, to self-manage their HF. Patient education should cover essential HF guidelines, including weight monitoring, diet and exercise recommendations, medications, and symptom management. On the basis of this study and previous research, evidence indicates nurses lack sufficient knowledge to provide critical HF education to patients. If nurses are unable to adequately educate patients, it is unrealistic to expect patients to practice self-management behaviors at home. Given the prevalence and chronic nature of HF, it is imperative that healthcare facilities develop effective interventions to educate staff caring for this patient population.

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## APPENDICES

### Appendix A. IRB Approval



Catawba Valley Med

Cat Institutional

#### Review Board

Catawba Valley Medical Center  
810 Fairgrove Church Road, SE  
Hickory, North Carolina 28602

Office 828-326-2490 • FAX 828-326-3641 • <http://irb.catawbavalleymedical.org>

Chair: Ann Moore, MSN, RN-BC, CEN  
Co-Chair: Rebecca Creech Tart, PhD

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To: Natalie Swiger BSN, RN

From: IRB

Date: November 5, 2014

RE: Notice of IRB Exemption

Exemption Category: Educational test, survey, interview, public behavior observation

Study Title: Assessing Nurses' Knowledge of Heart Failure in a Community North Carolina Hospital

Study ID: 2014.04

Study Dated: November 3, 2014

**PLEASE READ THIS LETTER CAREFULLY IN ITS ENTIRETY. IT CONTAINS IMPORTANT INFORMATION ABOUT YOUR SUBMISSION AND YOUR RESPONSIBILITIES AS AN INVESTIGATOR.**

This submission has been reviewed and was determined to be exempt from further review according to the regulatory category cited under 45 CFR 46.1-1(b)(2) exemption from 45 CFR part 46 requirements, and will not be monitored. If this study protocol is amended, it is your responsibility as the primary investigator to submit such changes to the IRB prior to implementing any changes.

**The IRB applies 45 CFR 46, Subparts A-D to all research it reviews regardless of funding source. 21 CFR 50 and 21 CFR 56 are applied to all research studies under the Food and Drug Administration regulation.**

Thanks for submitting your study materials and prior approval to the WCU IRB. Your application has been assigned the protocol number 2015-0133.

As noted by the Catawba Valley Medical Center IRB, your protocol meets the criteria for exemption under 45 CFR 46.102(b)(2): Educational Tests, Surveys, Interviews, or Observations. Your protocol is not subject to any further IRB monitoring by WCU's IRB. However, if you wish to make changes to your protocol, including recruitment procedures, sampling, consent, interventions, data collection methods, and investigators, please use the amendment request located on WCU's IRB website to submit your request in advance. If you have any questions, please call 828-227-7212 or email [irb@wcu.edu](mailto:irb@wcu.edu).

Good luck with your study!

## **Appendix B. Informed Consent**

Dear Nurse Colleague,

You are being invited to participate in a research study to explore nurses' understanding of current heart failure guidelines. This study is being conducted by Natalie Swiger, as part of a thesis requirement in the graduate nursing curriculum at Western Carolina University. Your input in this study will further the understanding of nurses' knowledge of heart failure guidelines and help identify needs in this area.

The total anticipated time to complete the questionnaire will be 5-10 minutes. Questionnaire data is returned anonymously, and electronic responses cannot be tracked to the sender. The only foreseeable risk associated with the research is an inadvertent breach in confidentiality. There are no direct benefits to participating in this study. Your participation in this study is completely voluntary and your electronically completed questionnaire will serve as consent to participate.

You are free to decide not to participate in the study or to withdraw at any time without adversely affecting your relationship with the investigator, Western Carolina University School of Nursing, or your employment with CVMC.

If, at any time, you have questions about the study, you may contact Natalie Swiger at (828) 446-7953 or the thesis director, Dr. Judy Neubrandner at [jneubrandner@email.wcu.edu](mailto:jneubrandner@email.wcu.edu). The Institutional Review Board (IRB) is a group of people who review the research to protect your rights. If you have any questions concerning your rights as a subject, email the Chair of the IRB at [irb@catawbavalleymc.org](mailto:irb@catawbavalleymc.org).

Click the "I agree" option below to indicate you are over 18 years old, you have read and understood the consent form, and you agree to participate in the research study.

Thank you in advance for your time.

Sincerely,

Natalie Swiger RN, BSN

Graduate Nurse Student

(828) 4467-953

[nrswiger1@catamount.wcu.edu](mailto:nrswiger1@catamount.wcu.edu)

I agree    I do not agree

## Appendix C. Nurses' Knowledge of Heart Failure Survey

Demographic Questions:

What is your area of employment?  Emergency department  Critical Care  Other

How many years of nursing experience do you have?  1-3 years  4-10 years  
 greater than 10 years

What is your education preparation?  ADN  BSN  MSN

Have you attended any continued education courses on heart failure since January 2014?

yes  no

1) Patients with Heart Failure (HF) should drink plenty of fluids each day. **True / False**

2) As long as no salt is added to foods, there are no dietary restrictions for patients with HF.

**True / False**

3) Coughing and nausea/poor appetite are common symptoms of advanced HF. **True / False**

4) Patients with HF should decrease activity and most forms of active exercise should be avoided. **True / False**

5) If the patient gains more than 3 pounds in 48 hours without other HF symptoms, they should not be concerned. **True / False**

6) Swelling of the abdomen may indicate retention of excess fluid due to worsening HF. **True / False**

7) If patients take their medications as directed and follow the suggested lifestyle modifications, their HF condition will not return. **True / False**

8) When patients have aches and pains, aspirin and non-steroidal anti-inflammatory drugs (NSAIDs like ibuprofen) should be recommended. **True / False**

9) It is OK to use potassium-based salt substitutes (like “No-Salt” or “Salt Sense”) to season food. **True / False**

10) If patients feel thirsty, it is OK to remove fluid limits and allow them to drink. **True / False**

11) If a patient adds extra pillows at night to relieve shortness of breath, this does not mean that their HF condition has worsened. **True / False**

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 HF condition has worsened. **True / False**

13) Lean deli meats are an acceptable food choice as part of the patient’s diet. **True / False**

14) Once the patient’s HF symptoms are gone, there is no need for obtaining daily weights. **True / False**

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. **True / False**

Statements in questions 16-20 reflect signs or symptoms that patients may have. Please indicate “yes” or “no” to signify whether a patient should notify their HF physician of these signs and symptoms.

16) BP recording of 80/56 without any HF symptoms. **Yes / No**

17) Weight gain of 3 pounds in 5 days without symptoms. **Yes / No**

18) Dizziness or lightheadedness when arising that disappears within 5 minutes. **Yes / No**

19) New onset or worsening of fatigue. **Yes / No**

20) New onset or worsening of leg weakness or decreased ability to exercise. **Yes / No**

## Appendix D. Permission to Use Survey

### NURSES KNOWLEDGE OF HEART FAILURE EDUCATION PRINCIPLES: AGREEMENT FORM

*Nurses Knowledge of Heart Failure Education Principles* is a clinical screening instrument used to assess nurse knowledge regarding 5 heart failure themes (HF) that should be included when providing home-going or chronic education to patients (and families) about self-management. The *Nurses Knowledge of Heart Failure Education Principles* instrument is an empirical scale that measures basic knowledge of heart failure (HF and HF self-care knowledge). The scale developer, who holds the copyright, wishes to assure standardization in the use of the instrument to build a normative database for interpreting scores. With this goal in mind, please agree to the following conditions in exchange for using this instrument:

- 1) User agrees to maintain the *Nurses Knowledge of Heart Failure Education Principles* instrument in the form provided, without modification, unless written approval is obtained from the scale developer;
- 2) User agrees to use the *Nurses Knowledge of Heart Failure Education Principles* instrument for her/his own work, without distribution to other colleagues, unless written approval is obtained from the scale developer;
- 3) User agrees to use the *Nurses Knowledge of Heart Failure Education Principles* instrument for no more than three years, with continued use beyond that period requiring a new request;
- 4) Within six months of acceptance of research findings at a regional, national or international meeting, user agrees to provide the following information (when applicable): title of abstract and name of meeting where work was accepted. If the abstract is/will be published in a peer-reviewed journal (not just a meeting syllabus), please provide citation information: authors, title, journal name, year, volume, issue and pp;
- 5) User agrees to cite the appropriate *Nurses Knowledge of Heart Failure Education Principles* instrument reference.

If in agreement with the above conditions, please sign this form, retain a copy for your records, and return the original for final signature and approval. This agreement is made with:


09/08/14  
 Nancy M. Albert PhD, RN, CCNS, CCRN, NE-BC Date

User's Name	_____		
(Typed or printed):	Natalie Swiger		
Signature (s):	 _____		
Date:	9/7/14 _____		
Title of Project:	Improving Nursing Expertise in Caring for Patients with Heart Failure		
Organization:	Western Carolina University - School of Nursing		
Address:	815 Memory Lane		
	Southport NC, 28461		
Telephone #:	(928) 446-7953	Fax #:	—
Electronic mail:	nswiger1@catamount.wcu.edu		

## **Appendix E. Recruitment E-mail**

Dear Nurse Colleague,

I am writing to ask your help with a research study for my graduate thesis at Western Carolina University. My research project is in the area of nurses' knowledge of heart failure education principles. Eligible participants are any registered nurses employed by CVMC.

Participating in this study includes completing the online questionnaire assessing Nurses' Knowledge of Heart Failure Education Principles. If you choose to participate, the following link will take you directly to a short questionnaire where you will be asked questions regarding heart failure education principles (you may need to copy and paste the link in your browser). The survey will take approximately 10 minutes to complete.

<http://www.surveygizmo.com/s3/1999007/Nurses-Knowledge-of-Heart-Failure-Education-Principles>

Your submission of the questionnaire will imply voluntary consent for research, and your responses will be returned anonymously to me. Thank you in advance for your time. I am most grateful for your assistance.

Sincerely,

Natalie Swiger RN, BSN

Graduate Nurse Student

nrswiger1@catamount.wcu.edu