Effectiveness of Education in the Management of Heart Failure

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Masters Capstone Project under the direction of

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April 2015

Abstract

Background: Heart failure remains to be one of the complex chronic health conditions in the United States to manage. It is estimated to hospitalize more than one million people a year and is attributed to approximately 56,000 deaths. Additionally it can be costly to treat due to reoccurring hospitalizations costing up to 21 billion as noted in 2012 estimates (Paul & Hice, 2014).

Objective: To demonstrate by providing patients and families in an acute care setting one on one education regarding heart failure education we can increase their knowledge as reflected in comparing pre-education surveys to post-education surveys, thus decreasing readmissions for heart failure management over a 30 and 60 day period.

Methods: A convenience sample of 13 patients admitted with a primary or secondary diagnosis of heart failure to Iredell Memorial Hospital over a two-week period. All participants were over age 18 and the evidence based project excluded those that had: Aphasia (unable to speak), Dysarthria (slow/slurred speech), Stroke (brain attack), Traumatic brain injury (head injury), Alzheimer's (altered mental status), Dementia (forgetful), Confusion and those who are under Hospice care or whom were discharging to a skilled nursing facility.

Results: The survey results showed a 32% increase in knowledge when comparing the pre-education survey group (n=13) results versus the post-education group (n=13) results. There were no readmissions 30 days or 60 day post discharge (n=13).

Conclusion: Providing patients with standardized heart failure education while in an acute hospital setting improves their knowledge of heart failure after discharge. This increase in knowledge can help empower patients to better manage their own chronic health conditions thus decreasing reoccurring hospitalizations, hospital length of stays, and costs. It has the potential to

increase quality of life and improve patient outcomes.

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Effectiveness of Education in the Management of Heart Failure

Heart failure (HF) continues to a be complex and difficult disease to manage; it affects patient's quality of life and can be a financial burden on health care organizations due to high re-admission rates. The American Heart Association in their 2015 update cited 5.7 million people have heart failure, which is projected to rise to 8 million by 2030. Newly diagnosed Americans account for approximately 870,000, of which up to half may die in 5 years of diagnosis (Go et al., 2013). Readmission rates within 30 days will occur in nearly 25% of patients, in 60 days this increases to nearly 50% (Veilleux, Wright, Cannon, Whalen, & Bachman, 2014). Studies have indicated that heart failure is a complex chronic problem that requires a multidisciplinary approach to improve quality, decrease costs, and improve length of stay (Buonocore & Wallace, 2014; Knox & Mischke, 1999; Paul & Hice, 2014).

According to the National Health Policy Forum (2001) costs for chronic illness consume up to 82%. With many agencies such as The Center for Medicare & Medicaid Services (CMS), American Heart Association (AHA), and Healthy People 2020 it is critical efforts be made to target heart disease to improve quality of care while driving down costs. In support of this, in 2013 CMS started to reduce total reimbursements by 1% for readmission rates associated with pneumonia, acute myocardial infarction, and congestive heart failure. By 2014 CMS reduced to 2% reimbursement and by 2015 3%, where reductions will be capped (DeFelice et al., 2010). With such health care reforms in place it is paramount that hospitals develop programs to manage chronic illnesses.

Problem Identification

According to the Centers for Medicare and Medicaid Services CMS (2014), a hospital readmission occurs when a patient is readmitted to any hospital within 30 days of being discharged from an acute hospital stay. Congestive heart failure (CHF) remains one of the top diagnosis-related groups (DRGs) for people over age 65 years. Additionally it is one of the most expensive in terms of readmissions, according to CMS Statistical Brief #142, 2009 data **"**The mean cost per CHF readmission is $13,000, with a 25.1 percent readmission rate. This is 118 percent the cost of an initial admission for CHF, which costs $11,000 on average" Qasim & Andrews (2009). Costs associated with readmissions are driven by the average length of stay (LOS), for CHF this is 6.2 days (Knox & Mischke, 1999). As noted by Paul & Hice (2014), at least half of readmissions are preventable with the proper multidisciplinary approach to discharge education and planning.

Purpose, Goals, and Objectives for Project

Purpose

There were several purposes for this evidence-based project. The first was to identify patients with a primary or secondary diagnosis of heart failure in a community based hospital. Additionally, the purpose was to gain understanding of patients' knowledge base of Heart Failure and improve education on Heart Failure. Lastly, use project to show the benefits of a structured discharge plan to staff in hope of developing future programs and standardized educational materials.

Goals

The goals of this project were to: 1) improve patients knowledge and understanding of heart failure management. 2) Develop educational materials for heart failure education 3) Avoid

readmissions of patients in 30 and 60 day increments due to better knowledge of self-care and management.

Objectives

The objectives of this project were to 1) determine patients level of understanding of heart failure prior to education 2) follow up with patient post hospitalization and analyze the effectiveness of the educational intervention

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Theoretical Framework

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The theoretical framework for this evidence-based project is based on Roy's Adaptation Model. Roy's adaptation model (as cited in Isbir & Mete, 2010) has eight steps that nursing can apply. Evaluation of the adaptive system, evaluation of behaviors, evaluation of stimuli, analysis of coping systems, nursing diagnosis, aim, nursing interventions, and evaluation. Furthermore, the goal of nursing in Roy's adaptation model is described as "the promotion of adaptation for individual and groups in each of the four adaptive modes, thus contributing to health, quality of life and dying with dignity (Parker & Smith, 2010, p.174).

Roy's adaptation model using the concepts of the metaparadigm can be applied to a heart failure patient's journey in dealing with a chronic illness. As nurses we assess patients as a whole. They function as one holistic being that are responding to their environment. By assessing heart failure patients as an individual or as a family, we can identify their ability to adapt. The environment is the stimuli that heart failure patients experience around them, requiring them to adapt as the environment is in constant movement or change. These stimuli can be positive or negative. Nursing's goal is to cultivate a positive adaptation. This can be accomplished by offering heart failure patients education that is simple and direct. Roy states "Health is not freedom from the inevitability of death, disease, unhappiness, and stress, but the ability to cope

with them in a competent way" (as cited in Smith, 2012). Heart failure becomes part of a person's life. How patients adapt holistically is what defines their health. Nurses assist patients in setting goals, they collaborate with patients to assist them in coping and achieving wellness.

Roy's adaptation model can assist in evaluating clinical outcomes in several ways. By assessing the effectiveness of interventions, and noting if the patient has adapted successfully. By identifying symptoms, beliefs and behaviors to illness or disease, a nurse can then assist a patient or population in positively adapting to their changing environment. In addition, the model places importance on the patient-environment relationship, this is important as what is effective for one person may not be for another. The care and process are unique and individualized, just as once cannot predict the environmental changes that may occur at any given time.

"The purpose of Roy's Adaptation Model-guided research is to study the concepts and proposition of the model, which requires both basic nursing research and clinical nursing research (Pawcett, 2009, p. 300). Nursing theory helps nurses guide their practice; it offers a roadmap by which to navigate. Roy's adaptation model can be used in practice to improve patient outcomes. It has been adapted in many curriculums due to its versatility and strength over time. Roy's model has been used to contribute to nursing science in both quantitative and qualitative studies (Clarke, Barone, Hanna, & Senesac, 2011). It is a comprehensive model and speaks to the holistic component of human beings, which makes it a fundamental component of nursing practice.

Review of Literature

The literature review aimed to compile studies that focused on heart failure and how it relates to acute care setting education and goals. A systematic review of the literature was conducted using CINAHL, Ovid MEDLINE, EBSCOHOST databases and supplemented by

reference lists of additional published articles. Key words in searches included: Congestive heart failure, education, health promotion, heart disease, heart failure, readmission rates and nursing. Articles between 2010-2015 were targeted, unless relevant.

Heart Failure

Heart Failure is defined as a complex chronic condition that has no cure. It relies on self-care and management by patients once diagnosed. However, as noted by Hancock et al., (2014), diagnosis can be difficult for providers and is missed up to two-thirds of the time. Classic heart failure is known to be left ventricular systolic dysfunction (LVSD), with inclusion of a reduced ejection fraction, however over 50% of heart failure patients hospitalized have a preserved ejection fraction, and as noted with vague symptoms and assessments diagnosis can be difficult. With the expanded guidelines of heart failure definition, those whom have both diastolic and systolic dysfunction need to be included regardless of ejection fraction. Similarly, to Buonocore & Wallace, (2014), ejection fraction of 40% or lower is defined as clinical heart failure, whereas heart failure with an ejection fraction of 40% and higher falls under the preserved heart failure category and includes additional criteria such as signs and symptoms and echocardiogram diagnostics for a proper diagnosis. Management of heart failure can differ dramatically and therefore a full clinical picture needs to be obtained to determine the proper course of treatment. Fluid volume overload, perfusion, onset and comorbid conditions are necessary to consider when making a treatment plan (Paul & Hice, 2014).

In one study confidence in professionals in regards to diagnosing left ventricular heart dysfunction (LVHD) vs. preserved heart failure (HFpEF) showed significant numbers. In regards to LVHD cardiologists surveyed were 95% confident in diagnosis, with general physicians 93% confident. However in regards to diagnosis of HFpEF, cardiologist were 58% confident and

general physicians 43%. The study continued to report differences were related to non-standardized management of heart failure, differing access to diagnostic testing and variance in delivery care models (Hancock et al., 2014).

Heart failure management is noted to require a multidisciplinary approach. In order to improve patient outcomes a system wide approach is necessary, this includes the acute inpatient care setting as well as the outpatient setting. As noted by Knox & Mischke, (1999), care of a patient with heart failure varies. "17% of patients are followed by cardiologists, 43% by general internists, 29% by family physicians and 11% by other health professionals" (p.68).

During an acute hospitalization stay care team members from acute care nurses, emergency room staff, pharmacy, dietary and rehabilitation staff may all be involved in a patients care. According to Paul & Hice, (2014), nurses play a pivotal role in assessing, improving outcomes and decreasing hospitalizations for heart failure patients. However noted that studies to guide best practices for nurses are lacking.

In one study, a heart failure management program was initiated over an 18-month period, which had an impact on cost from readmissions and length of stay. It incorporated inpatient, outpatient, home care and compliance monitoring. Overall the study found that use of standardized education consistent at all points of contact with the multidisciplinary team was an effective approach. The study was able to reduce length of stay to 4 days, with a national average of 6.2 days, and impacted readmissions, with 2.3% 30-day readmission rate, against national rate of 23%. Its focus was developing a critical pathway for heart failure. Education began in the hospital and continued in the home and/or outpatient setting. The team individualized the educational sessions by making patient co-managers by helping patients identify reasons for non-adherence, develop strategies and for staff to encourage self health promotion (Knox & Mischke,

1999).

DeFelice et al., (2010) described another study in which readmission rates for heart failure patients was reduced from 30% to 15%, and patients discharged without home care services decreased from 33% to 12%. These outcomes were from a program that used primarily nursing driven patient education initiatives based on evidence-based practice. The program was driven by a nurse disease manager and involved a multidisciplinary team. Care began in the inpatient setting and followed patients weekly for six-week period via telephone. Coordination of care with primary care physicians, and cardiologists, and dieticians was necessary to meet outcomes.

In a randomized controlled trial in Sweden, a nurse led education and psychosocial programme did not prove cost-effective. Using QUAL (quality-adjusted life year) weights, which is a measurement in health economics and involves calculating a patient's value of a health state with the length, the study found no significant mean difference in the two groups. However both groups did improve their QUAL weight from their baseline during the 12-month period. The intervention included three face-to-face sessions at two, six and twelve weeks. Patients and partners were given education on heart failure and worked on problem solving skills. The control group received the standard hospital and outpatient care and partners were not necessarily involved (Agren, Evangelista, Davidson, & Stromberg, 2013).

Methodology and Procedures

Research Question

Does providing patients with standardized heart failure education while in an acute hospital setting help to improve their management of heart failure after discharge?

Design

A quasi-experimental design approach was used to understand the knowledge base of patients with a diagnosis of heart failure during an acute hospitalization and post-hospitalization. A pre and post educational questionnaire was used to assess the correlation of an educational intervention in improvement in understanding management of heart failure. Post hospital records at 30 and 60 days post discharge were checked for readmission episodes of care.

Sample

A convenience sample of patient's admitted with a primary or secondary diagnosis of heart failure to Iredell Memorial Hospital over a two-week period. All participants were over age 18 and the evidence based project excluded those that had: Aphasia (unable to speak), Dysarthria (slow/slurred speech), Stroke (brain attack), Traumatic brain injury (head injury), Alzheimer's (altered mental status), Dementia (forgetful), Confusion and those who were under Hospice care or discharged to a skilled nursing facility.

The principal investigator met daily with the quality and clinical outcomes nurse to get a daily census of patients which included diagnosis, however as it only listed primary diagnosis' manual patient searches and daily check ins with charge nurses were made to identify additional patients with heart failure as a secondary diagnosis. Staff on CCU and Telemetry units were made aware of project by one on one communication, flyers and notification in the Huddle Book where weekly updates are provided and reviewed with staff by the charge nurse at the start of every shift. The principal investigator obtained a convenience sample of (N=13) to participate in the project between January 19th and February 1st, 2015. All identified patients gave permission and fully participated.

Variables

The outcome variable of the heart failure post education knowledge was measured by the

data obtained from the pre-education questionnaire compared to the post-education questionnaire (Appendix A) after the educational session. The dependent variable of the project was to increase the knowledge of heart failure patients about signs and symptoms of heart failure and have no readmissions at 30 and 60 days post discharge. The independent variable was the educational session provided.

Data Collection Method

The evidence based project was conducted at Iredell Memorial Hospital in Statesville NC. During a consecutive two week period any patient admitted with a primary or secondary diagnosis of heart failure was approached and requested to voluntarily participate by the principal investigator. If the patient was interested, the principal investigator described the project expectations and answered any questions. Once the subject signed the informed consent (Appendix C) to demonstrate acknowledgement and approval to participate, the participant was then asked to answer a 10 question pre-knowledge questionnaire about heart failure. Once the questionnaire was completed, the principal investigator provided the participant with standardized heart failure education (Appendix B), which took approximately 15-30 minutes. Background information (Appendix E) was collected from the medical record including age, race, gender, education level, occupation and co-morbidities. A week following the participants discharge, the participant received a call from the principal investigator to request the subject answer the same 10 questions about heart failure (Appendix D). Participation took approximately one hour total on two separate days. A folder was created for each patient to include signed consent, pre and post test questionnaire, background information, and follow up phone script (Appendix D). Each patient was given a number from 1-13. Data collected was placed in envelopes labeled pre and post education and stored using a double lock system and maintained

by Nina Swan MSN, Director of Critical Care and 2 North Telemetry, all information was kept

confidential. The information gathered was entered into a secured Excel program, only accessed

by the principal investigator.

In providing the heart failure education each patient was given a copy of heart failure

educational handout, which was an 18-page power point style packet (Appendix B). The

educational handout was written by the principal investigator with input and coordination from

the director of Critical Care and 2 North Telemetry, the Assistant VP of Quality and Clinical

Outcomes, and the Home Health Director to ensure education was current and consistent with

any additional related heart failure education patients may receive from this particular health care

system. Education covered the definition of heart failure, symptoms of heart failure, treatments

for heart failure, 6 steps to a healthier you and was further broken down by medications,

physician appointments, daily weights, green, yellow and red zones, what to eat and drink,

activity, and items to avoid such as alcohol, caffeine and tobacco.

Data Analysis

Data was collected by written questionnaire and interview. The responses were coded

into a Microsoft Excel spreadsheet program to include the pre and post-test questionnaire

answers. Data was analyzed using a paired *t*-test to determine if significance of ($p<0.05$) was

met. All data was recorded and checked for accuracy by Dr. Grace Buttriss DNP, RN, FNP-BC,

CNL, Nursing Faculty at Queens University of Charlotte who acted as an advisor and mentor for

this evidence based project. The principal investigator entered all the data into an Excel

spreadsheet. Data for each patient was analyzed and coded.

Background data gathered is available in Figures 1-6. Participants equally fell between

age 50-69 at 46% and over age 70 at 45% with the smallest participant percentage in age range

30-49 as shown in Figure 1. Most of the participants were Caucasian at 85%, while 15% were

African-American (Figure 2). There were more male participants (69%), than female (31%).

Figure 4 shows that 62% had a high school diploma or below, and 38% with some college. Most

participants were retired at 69%, while 31% were on disability. And 85% of the participants had

greater than 3 co-morbidities and 15% had 2 or less (Figure 6). As noted on Figure 8, the

national average length of stay (LOS) for heart failure is 6.2 days, compared to this study's 8.6

days (N=13).

Results

To determine patients' level of understanding of heart failure the pre and post education

questionnaire data was analyzed using a paired t-test to determine if significance of ($p<0.05$) was

met. Data was collected using the same 10 questions for the pre and post educational

questionnaire. The total sample size was (N=13). The paired t-test indicates that the results were

statistically significant (p= 0.0139) (Table2). The obtained t value of 2.72 exceeds the critical t

value in the table (2.101), which shows that the t test is statistically significant and indicates a

difference between pre and post educational questionnaire results. Table 1 displays the pre and

post educational questionnaire percentage results. The pre and post education questionnaire was

a total of ten questions. The overall pre questionnaire score was 59.8%. On question one, 77%

(n=10) of the patients scored correctly, which asked what weight gain should you report to your

doctor and on the second and fifth questions which addressed limiting salt and checking your

weight. Question number three was the highest score at 92% (n=12) and asked why a little

movement/exercise each day is important. On the forth question, 60% (n=8) of patients scored

correctly, this was the lowest score and asked which of the following are a significant sign and

symptom of heart failure. On questions six, seven and ten, patients scored 85% (n=11), and on

questions eight and nine 70% (n=9) of patients scored correctly. These questions were when is the best time of day to weigh yourself and what does heart failure mean.

After the education session about heart failure, patients received a phone call one week after discharging home, during this call a post education questionnaire with the same ten questions was given. The overall post education questionnaire score was 92.1%, which showed a 32.3% increase from the pre education questionnaire. Questions one, two, four, five, seven, eight and ten had a 92% (n=12) score. Questions three and six were 100% (n=13) and the lowest score was question 9, 77% (n=10), which asked what heart failure means. All ten questions showed an improved score from pre and post education questionnaire results.

In addition to an increase in overall all scores of pre and post education questionnaires, no patients were re-admitted to Iredell Memorial Hospital at 30 and 60 day post discharge.

Discussion

The goal of the study was to improve patients' knowledge and understanding of heart failure management, develop educational materials for heart failure education and avoid readmissions of patients in 30 and 60 day increments due to better knowledge of self-care and management.

The goal of improving patients' knowledge and understanding of heart failure was met. There was a significant increase in the pre and post educational questionnaire survey results of 32.3%. Additionally, patients were provided standardized educational materials to take home and refer to as needed, this likely led to improved self care and management and resulted in no readmissions at 30 and 60 days post discharge.

Description of How Findings Relate to Literature

A review of the literature showed that heart failure is difficulty to manage and requires

multiple disciplines both in the acute care setting and in outpatient settings to manage

effectively. As noted by Buonocore & Wallace (2014), patient and caregiver education using a

teach back method regarding diet, activity, medications and daily management will improve

outcomes and allow them to have a role in their self care. Furthermore, having a well defined

plan and follow up with health care providers within three days of discharge can improve

outcomes. When compared to this project a one-week post phone call was initiated, this allowed

patients time at home to act on their own management and use the provided educational guide as

needed if questions arose.

In a study by the Evanston Northwestern Healthcare (ENH) system the 30 day

readmission rate for heart failure was 17% and at 6 months as high as 35%. However with

implementation of programs that combined inpatient, outpatient and home care components they

were able to decrease the 30-day readmission rate to 2.3% and be noted as clinically significant

against the national benchmark of 23%. Interventions such as education on weight gain, diet and

medications at an early point of care was noted to make the difference (Knox & Mischke, 1999).

A common theme in the literature was in order to improve heart failure costs; outcomes

and quality of care nurses were the best and consistent point of care and resource for patients

(Knox & Mischke, 1999; Paul & Hice, 2014; Veilleux et al., 2014).

The results of the evidence based project as related Roy's Adaptation Model are

supported in that nurses can have a direct impact on cultivating a positive adaptation for patients.

In teaching patients individually about diet, exercise, medications and lifestyle nurses are able to

assist the patient to adapt to what will best meet their needs. Roy's adaptation model is complex;

it has many layers of concepts that can overlap. However, when broken down and applied to any

clinical situation, such as heart failure, it becomes clear and can be easily applied. We all are in a

constant flux of adapting to our environments. How we cope to various stimuli represents our

relationship with the environment. Roy identified four modes of adaptation: Physiologic-physical

mode, self-concept-group identity, role function and interdependence (Parker & Smith, 2010).

Modes can be applied to individuals or groups. The physiologic-physical mode is comprised of

basic human needs. Parker & Smith (2010) outline nine components: oxygenation, nutrition,

elimination, protection, activity and rest, senses, fluid-electrolyte and acid-base balance and

neurologic and endocrine functions. Behaviors in the physiologic-physical mode of a cardiac

patient can be proper nutrition for healing and energy, pain management in relation to activity

and proper hydration to maintain electrolyte balances for elimination. Self-concept-group

identity mode encompasses our beliefs and feelings. In a cardiac patient this may include body

images related to surgical scars, the perception of how we look, or our beliefs about how others

may view us; feelings about ourselves as ill or healthy. The role function mode relates to our

place in this world. How we are perceive ourselves in roles within society and related

expectations. The thought of how will a chronic cardiac condition or diagnosis affect our ability

to be a father, a businessman and a friend. Roy's last mode, interdependence, focuses on

relationships and support systems. A cardiac patient may experience the need to rely on family,

friends or support groups in order to adapt to their new diagnosis.

Roy's adaptation modes are interrelated and one mode can have an effect on another, this

requires nurses to evaluate each mode and how it relates to or can affect the others (Isbir & Mete,

2010). Based on results of the study, patients were able to improve their understanding of heart

failure signs, symptoms and management and therefore support Roy's four modes of adaptation.

Limitations

Limitations of this study include small sample size, one community based facility

with limited resources and timeline. Although there were several patients admitted with heart failure, there were some that could not participate due to mental status, or those whom were admitted from a skilled nursing level of care facility with plans to return. This limited generalizability in that the sample eliminated those that may be more vulnerable. Another limitation was ability to effectively pull data on heart failure patients as the facility only identified those admitted with a primary diagnosis of heart failure. This lead to many manual searches by the principal investigator and collaboration with charge nurses and staff to identify others, thus not being able to accurately identify all possible participants. Additionally, the questionnaires were not tested for reliability or validity as they were developed for this project by the principal investigator.

Implications for Nursing

Results from this study further strengthen the literature that nurses are in a pivotal position to impact patients self-management of heart failure, improve quality outcomes, and reduce hospitalizations thus decreasing organizational costs. Standardized heart failure education materials and nurses advanced knowledge of heart failure management can have an impact on this chronic difficult to manage disease. The ability of nurses to be able to teach patient and caregivers in the acute care setting is unique. Nurses can assess for readiness, involve caregivers and individualize the education based on what they assess the patients' barriers are. By building a relationship and following up with patients upon discharge nurses can build trust and understanding and enable patients to better self manage their own care.

Implications for Further Study

Further study can be done to evaluate the learning needs of patients with heart failure. Assessing a patient's health literacy or barriers to learning would be beneficial in developing a

more comprehensive plan. Additionally working with patients to identify reasons for non-adherence to heart failure management would provide a better-streamlined approach to noted barriers. Assessing nurses understanding of heart failure management and comprehension and ensuring providers are all using the same definitions and goals to manage heart failure could add to improved outcomes. Many interventions in moving forward to better develop a heart failure model can be implemented and managed on a nursing level with proper physician or organizational support. Using existing resources and better collaboration among all disciplines both inpatient and outpatient heart failure outcomes can be improved.

Conclusion

Heart failure remains a major health care problem that has rippling effects on quality of life, mortality rates, patient outcomes and organizational costs. Healthcare providers need to be collaborating and managing heart failure in a common and systematic way. Nurses are able to be at all points of care providing education and management to improve outcomes. Initiating education of heart failure in an acute care setting and following that care post discharge in collaboration with others can have a positive impact on quality, length of stay and re-hospitalizations.

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Table 1

Percentage of Correct Answers for Pre and Post Questionnaire

% Of correct answers Pre and Post Test	**Pre test**	**Post test**

Correct Answers

1) What weight gain should you report to your doctor?
        a) 2 pounds in one month
        b) 4 pounds in a year
        c) 2-3 pounds in 24 hours   **77%**   **92%**
        d) none of the above

2) What is the purpose behind the doctor asking you to limit salt (sodium) intake and monitor your fluids?
        a) Salt will interact with my medication
        b) I don't need to limit salt or monitor fluids
        c) salt acts like a sponge and makes my body hold onto water   **77%**   **92%**
        d) none of the above

3) Why is a little movement/exercise each day important?
        a) It helps to strengthen my heart muscle   **92%**
100%
        b) exercise will make my heart failure worse
        c) I should not exercise if I have heart failure
        d) all of the above

4) Which of the following are a significant sign and symptom of Heart Failure?
        a) a sudden weight gain
        b) swelling of the hands, feet, legs, ankles, or abdomen
        c) difficulty breathing
        d) all of the above   **6%**
92%

5) How often should you weigh yourself?
        a) once a week
        b) once a month
        c) daily   **77%**
92%
        d) none of the above

6) If a medication your taking makes you feel sick the best thing to do is
        a) stop taking the medicine
        b) take a smaller dose of the medicine
        c) call you doctor and report your symptoms   **85%**
100%
        d) do nothing

7) I should seek medical care immediately if
        a) I have chest pain

b) Increased trouble breathing
c) I am dizzy and sweating
<mark>d) All of the above   85%   92%</mark>

8) It is best to weigh my self
<mark>a) in the morning after I urinate (pee)   7%   92%</mark>
b) before going to bed
c) at various times of the day
d) time of weighing does not matter

9) Heart Failure means
a) my heart no longer works and cannot be fixed
<mark>b) my heart muscle is weak   7%   77%</mark>
c) my heart pumps blood easily
d) none of the above

10) Smoking or using tobacco products
a) Has no effect on my heart
b) Does not permanent damage
<mark>c) Robs my heart of oxygen, raises my heart rate & blood pressure 85%</mark>
<mark>92%</mark>
d) Keeps my blood pressure normal

Table 2

Paired t-test for Means for Pre and Post Questionnaire

| **Comparing Means [t-test assuming equal variances (homoscedastic)]**			
Descriptive Statistics			
VAR	*Sample size*	*Mean*	*Variance*
	10	59.8	1,366.62222222222
	10	92.1	39.2111111111111
Summary			
Degrees Of Freedom	18	*Hypothesized Mean Difference*	0.E+0
Test Statistics	2.72417876989774	*Pooled Variance*	702.916666666667
Two-tailed distribution			
p-level	0.013917487658625	*t Critical Value (5%)*	2.10092204024104
One-tailed distribution			
p-level	0.006958743829313	*t Critical Value (5%)*	1.73406360661754
G-criterion			
Test Statistics	0.592660550458716	*p-level*	0.000374130476683
Critical Value (5%)	0.25		
Pagurova criterion			
Test Statistics	2.72417876989774	*p-level*	0.97737979888916
Ratio of variances parameter	0.972108278996246	*Critical Value (5%)*	0.064399511959171

Figure 1. Age Distribution
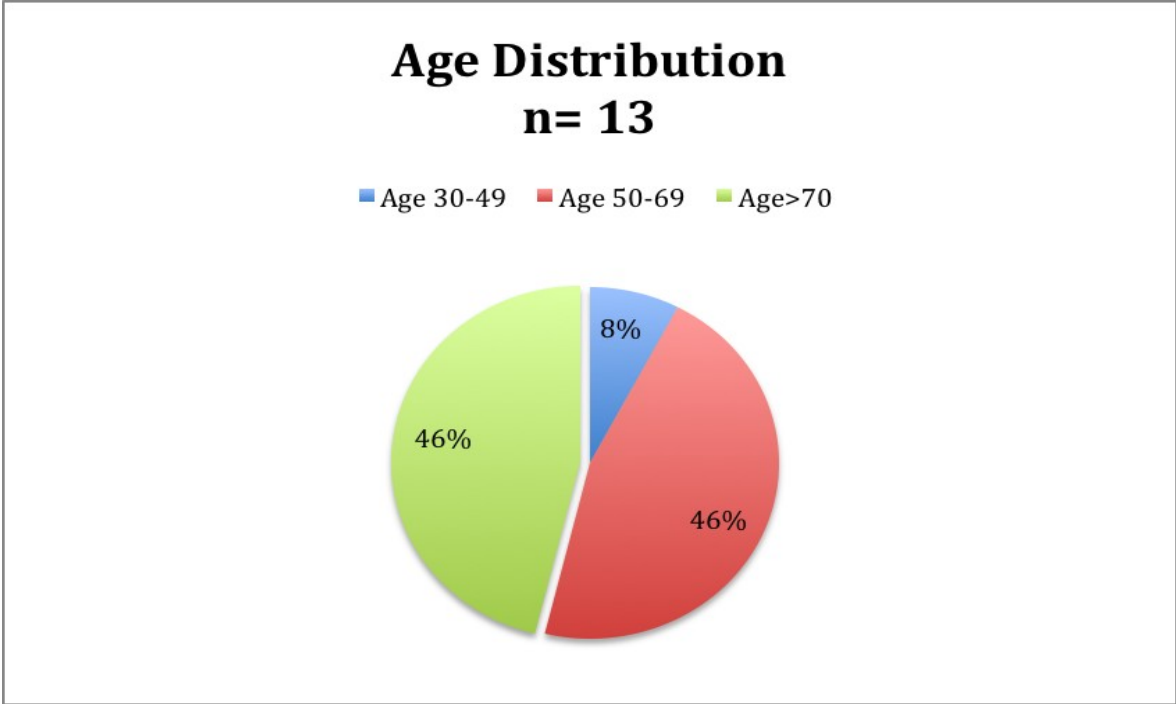
Figure 1: Participants equally fell between age 50-69 at 46% and over age 70 at 45% with the smallest participant percentage in age range 30-49
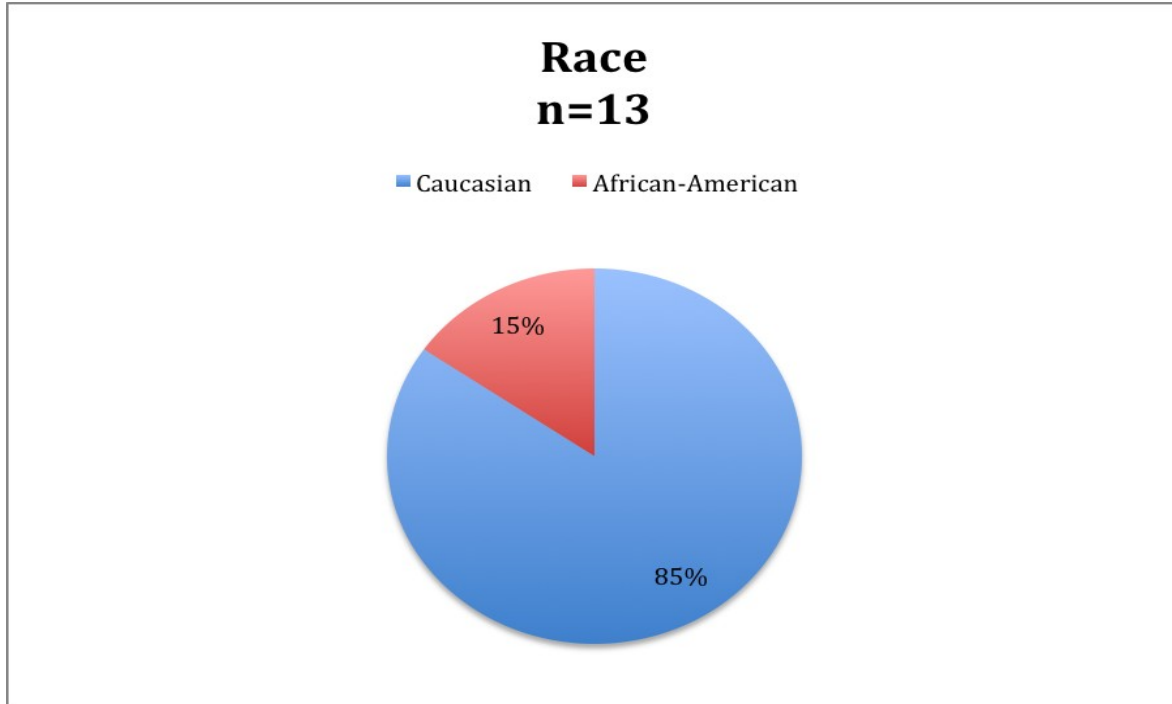
Figure 2. Race Distribution

Figure 2: Most of the participants were Caucasian at 85%, while 15% were African-American

Figure 3. Gender Distribution
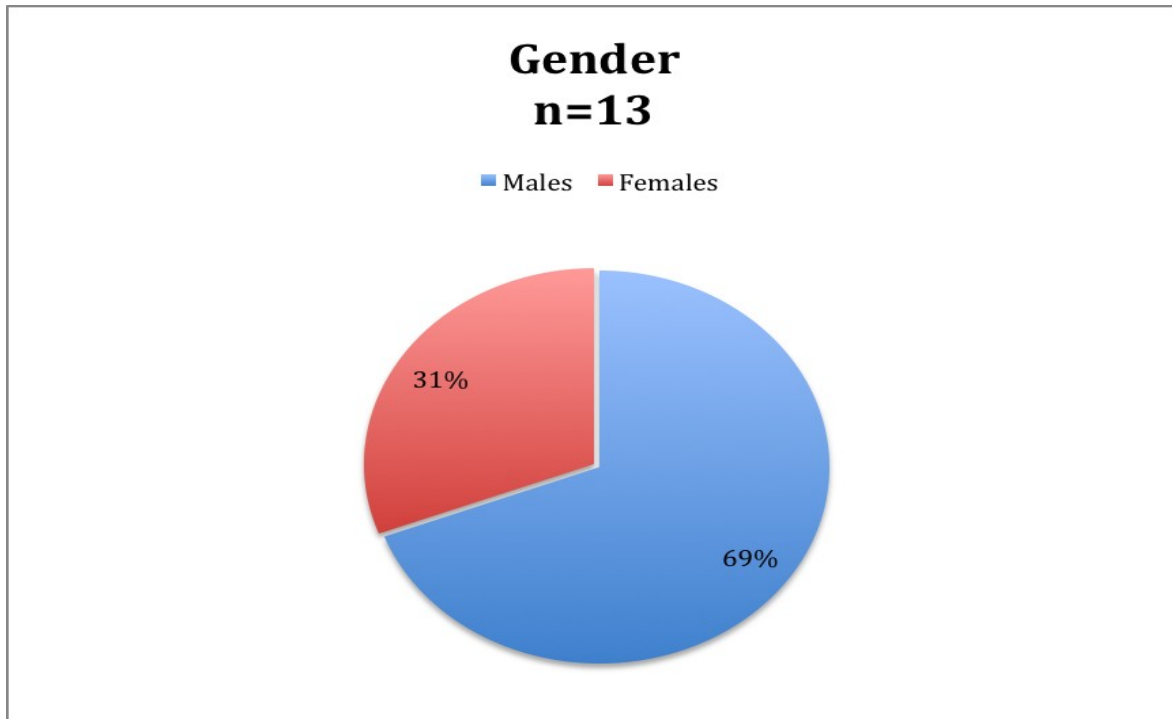
Figure 3: There were more male participants (69%), than female (31%)

Figure 4. Educational Level Distribution
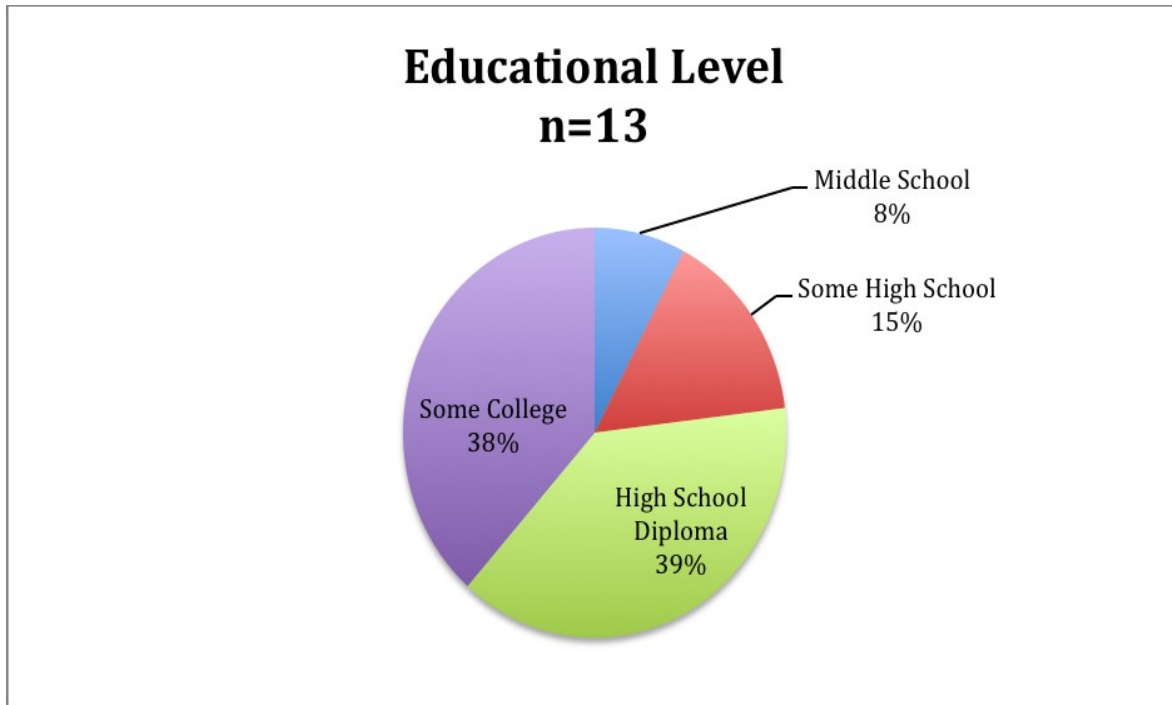
Figure 4: 62% had a high school diploma or below, and 38% with some college

Figure 5. Occupation Distribution

Occupation
n=13

31 % Disbabled
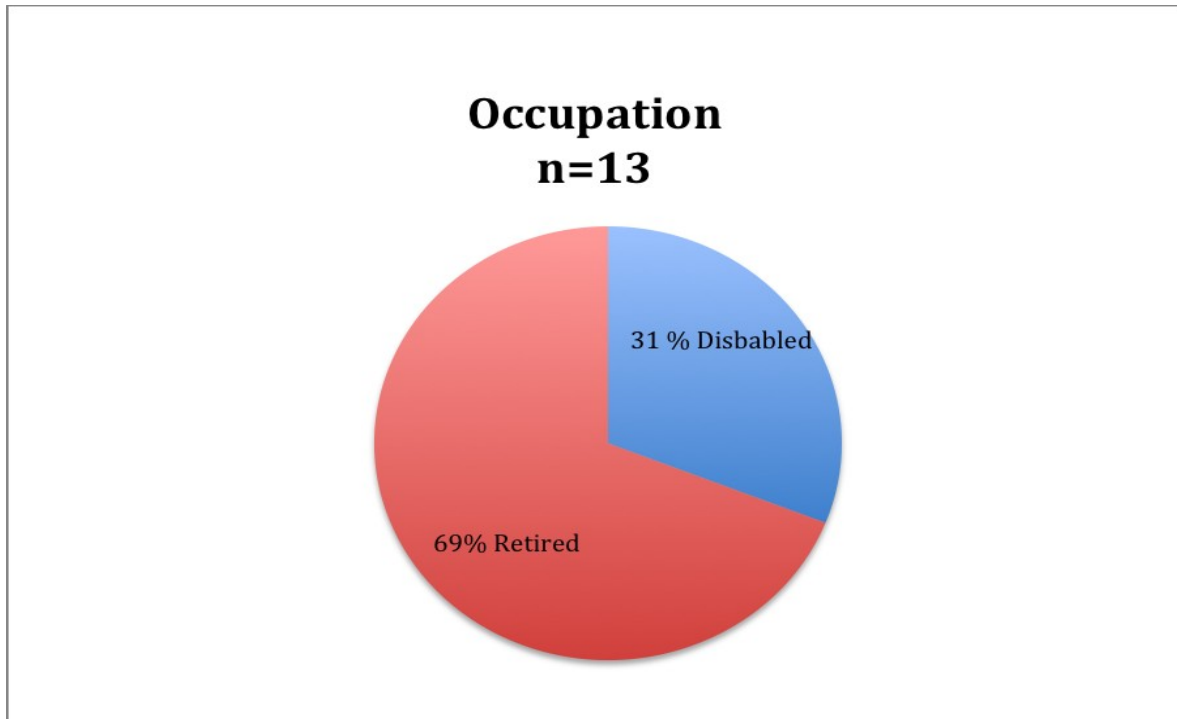
69% Retired

Figure 5: Most participants were retired at 69%, while 31% were on disability

Figure 6. Co-Morbidity Distribution
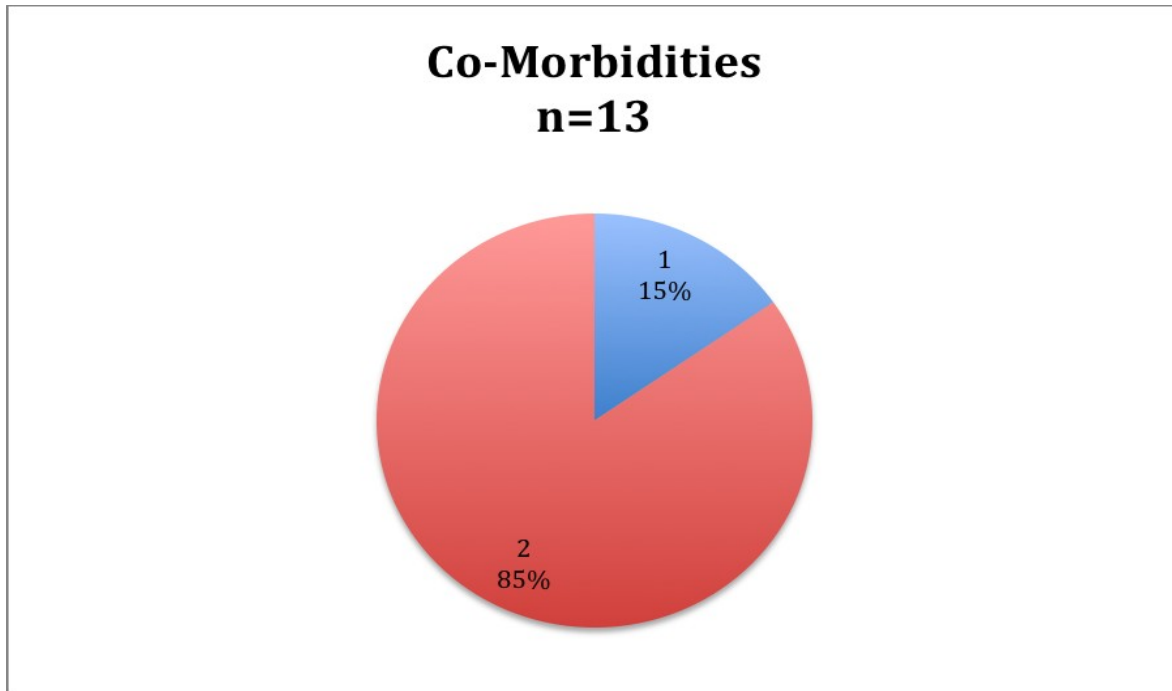
Figure 6: 85% of the participants had greater than 3 co-morbidities, and 15% had 2 or less

Figure 7. Questionnaire Test Scores
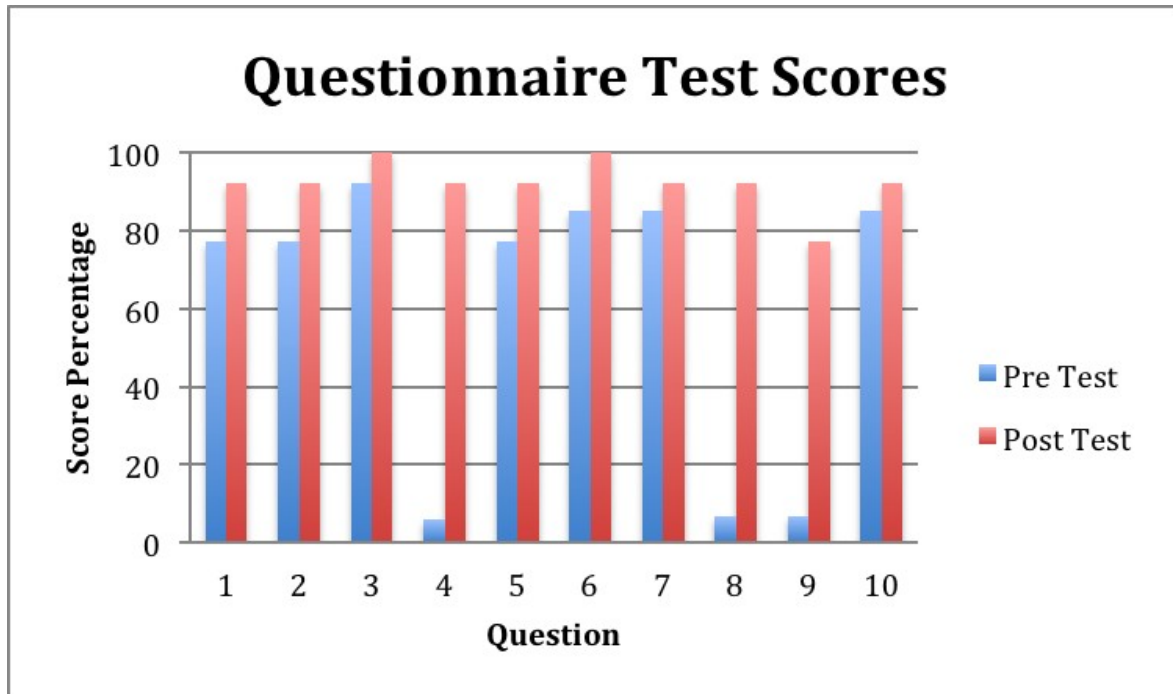
Figure 7: This graph compared the test scores for pre and post-test results.
Improvement was made in all questions

Figure 8. Length of Stay in Days

Figure 8: National average length of stay (LOS) for heart failure is 6.2 days, compared to this study's 8.6 days

Appendix A

Heart Failure Pre-Education Questionnaire

Please circle the correct answer for each question

1) What weight gain should you report to your doctor
        a) 2 pounds in one month
        b) 4 pounds in a year
        c) 2-3 pounds in 24 hours
        d) none of the above

2) What is the purpose behind the doctor asking you to limit salt (sodium) intake and monitor your fluids?
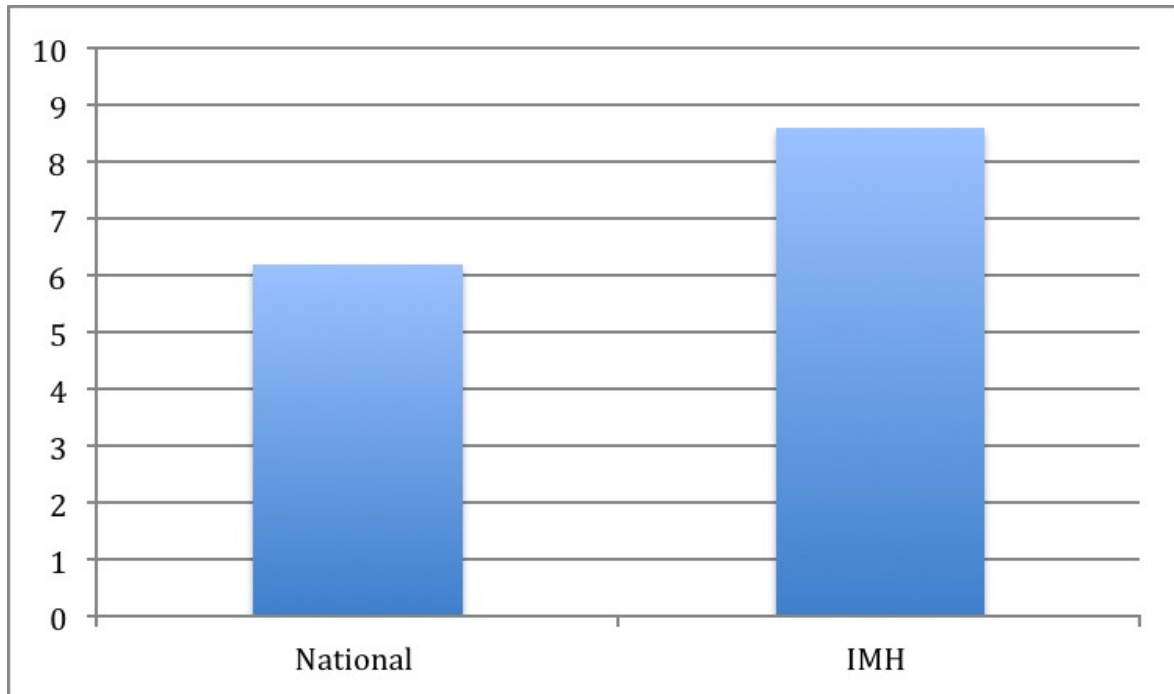   a) Salt will interact with my medication
        b) I don't need to limit salt or monitor fluids
        c) salt acts like a sponge and makes my body hold onto water
        d) none of the above

3) Why is a little movement/exercise each day important?
        a) It helps to strengthen my heart muscle
        b) exercise will make my heart failure worse
        c) I should not exercise if I have heart failure
        d) all of the above

4) Which of the following are a significant sign and symptom of Heart Failure?
        a) a sudden weight gain
        b) swelling of the hands, feet, legs, ankles, or abdomen
        c) difficulty breathing
        d) all of the above

5) How often should you weigh yourself?
        a) once a week
        b) once a month
        c) daily
        d) none of the above

6) If a medication your taking makes you feel sick the best thing to do is
        a) stop taking the medicine
        b) take a smaller dose of the medicine
        c) call you doctor and report your symptoms
        d) do nothing

7) I should seek medical care immediately if
        a) I have chest pain
        b) Increased trouble breathing

      c) I am dizzy and sweating
      d) All of the above

8) It is best to weigh my self
      a) in the morning after I urinate (pee)
      b) before going to bed
      c) at various times of the day
      d) time of weighing does not matter

9) Heart Failure means
      a) my heart no longer works and cannot be fixed
      b) my heart muscle is weak
      c) my heart pumps blood easily
      d) none of the above

10) Smoking or using tobacco products:
      a) Has no effect on my heart
      b) Does not permanent damage
      c) Robs my heart of oxygen, raises my heart rate and blood pressure
      d) Keeps my blood pressure normal

Appendix B

Heart Failure:
Education for Patients and Families

PROVIDED BY
JACENTA BEST BSN, RN CNL STUDENT

What is Heart Failure?

Heart Failure is when the body is having difficulty pumping blood around your body

When this happens, your body is not getting the oxygen it needs

Sometimes extra fluid builds up and can go into other parts of the body such as lungs, feet or ankles, belly

It is sometimes referred to as Congestive Heart Failure (CHF), Pulmonary Edema or fluid on the lungs.

Symptoms of Heart Failure

Since blood is not pumping the way it should, you might have some or all of these feelings:

Have a hard time breathing

Have swollen ankles, feet, or legs, or belly

Feel weak and tired

Have a hard time lying flat to sleep

Sudden weight gain

Coughing

Treatments for Heart Failure

Heart Failure CAN be treated!

Heart failure is a chronic condition that will never go away, but it can be treated.

Treatments your doctor may use:

Medications (water pills, heart rate, or blood pressure)

Procedures (x-rays, blood tests, echocardiogram)

Surgery

But most of all YOU have the ability to stay well

6 Steps to a Healthier You

You are the most important link in staying healthy, SIX steps to feeling good and staying out of the hospital are:

1. Take Medications your doctor gives you
2. Go to all your doctor appointments
3. <u>Check your weight and record daily, watch for changes in how you feel</u>
4. Adjust what you eat and drink
5. Keep moving, being active
6. Limit alcohol and caffeine, and do not use tobacco

Patient who follow these steps…..

Feel Better

Live Longer

Spend less time in the hospital

Step 1: Medications

It is important to take medications how the doctor tells you to

If a medication is making you feel sick- DO NOT stop taking it, call the doctor and to report how you feel

Keep a list of medications you are taking

Bring your medication list to all doctor appointments

Step 2: Go to your doctor appointments

Heart failure is not always easy to control, seeing your doctor on a regular basis will keep you healthier

Its always best if staff can make a follow up appointment for you BEFORE you discharge home

Bringing a family member or friend can help

Bring a list of all medications you use- even over the counters medications, vitamins and herbals

*Bring your list of daily weights

Step 3:Checking your weight and be aware of how you feel

Weight gain is one of the first signs fluid is starting to build up in your body

Weigh yourself every day and write it down

It is best to weigh yourself every morning after you urinate (pee) so that it is consistent

*Call you doctor when you gain 3 pounds in one day or 5 pounds in one week- *this is an early warning something has changed*

*Tell the receptionist that you are a heart failure patient and you have gained 3 pounds over night.

How are you feeling? **Green**, **Yellow**, or **Red?**

Using Zones can help you think about how you are feeling and what you should do:

Green Zone: "All Clear" you have no shortness of breath, no weight gain, no swelling- feeling good

Yellow Zone: "Caution" you have weight gain, breathing may be a bit hard, swelling in legs or feet, feeling tired – TIME TO CALL THE DOCTOR

Red Zone: "Emergency" you are struggling to breath, you may feel faint, or have chest pain CALL 911

Step 4: Adjust what you Eat & Drink

Salt or Sodium in high amounts can cause weight gain! Salt acts like a sponge and makes your body hold onto water

How much salt is okay? It is recommended you eat LESS than 2000mg or <u>one teaspoon</u> of salt each day

Reading food labels can help. Items that are "salt free" for "sodium free", "low sodium" or "no salt added" are a good place to start

High Salt (sodium) Foods

These items should be avoided:

Canned foods or prepackaged items

Deli meats, sausages and kielbasa

Pickles

Potato or tortilla chips

Ham and bacon

Pasta sauces

Salad dressings, soy sauce

Soft drinks

Fluids- Drinking

Do not restrict the amount of fluids you drink unless you doctor tells you too

Be aware some drinks have high levels of salt in them (soft drinks, sports drinks)

Some medications for heart failure will make you have to urinate often, but you need to continue to drink fluids to stay healthy

Limit alcohol and caffeine as they can make

heart failure worse

Step 5:Keep Moving- Be Active

Staying active every day will help strengthen your heart muscle

Talking to your doctor about what level of exercise you can do is important

Pace yourself

Take rests if you get tired

Step 6:Limit alcohol and caffeine, and do not use tobacco

Alcohol and caffeine can make heart failure worse and they can affect your medications

Tobacco makes the heart work harder and can lead to heart attacks

There are many resources available for you to quit smoking- please ask you doctor

Summary

- YOU play an important role in managing your heart failure
- Follow the six steps to stay well, live longer and stay OUT of the hospital

1. Take Medications
2. Go to doctor appointments
3. Check your weight and record daily, watch for changes in how you feel
4. Adjust what you eat and drink
5. Keep moving, being active
6. Limit alcohol and caffeine, and do not use tobacco

What are 3 new things you learned?

Thank You for your participation !

Appendix C

Iredell Memorial Hospital

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Effectiveness of Education in the Management of Adult Heart Failure

INTRODUCTION

You are being asked to participate in this evidence based practice research study at Iredell Memorial Hospital (IMH) given by Jacenta A Best BSN, RN. The purpose of this evidence based practice study is to identify if standardized education in heart failure patients will increase a patients ability to self manage heart failure and decrease need for future hospitalizations for heart failure. You are being asked to take part because you have a diagnosis of heart failure. The project is a requirement for completing a Masters in Nursing degree at Queens University of Charlotte.

You will be one of approximately 30 people involved in this research project at IMH and your total participation will last for one week.

HOW THE STUDY WORKS

If you agree to take part in the study, the principal investigator will collect background data including age, race, gender, education level, occupation, and co-morbidities from your medical record. You will be asked to answer 10 questions about heart failure; this will take approximately 5-10 minutes to complete.

Following the completion of the questionnaire, a 15-minute educational session will be provided by the principal investigator about heart failure management.

You will be asked to provide a phone number so the principal investigator can contact you within one week after your discharge. During the phone call you will be asked to answer 10 questions about heart failure. This phone call will take approximately 5 minutes.

Your participation will take approximately one hour total on two separate days.

The decision to participate in this study is completely up to you. If you decide to be in the study, you may stop at any time. You may skip any item you do not wish to answer. You will not be treated any differently if you decide not to participate or if you stop once you have started.

RISKS

There is a slight risk for a breach of confidentiality. Data collected will be stored using a double lock system and maintained by Nina Swan MSN, Director of Critical Care and 2 North Telemetry. All information you provide will be coded and not linked to your name. Your identity

will be kept anonymous in presentations, reports, and publications of the study.

BENEFITS

This study may or may not improve your condition. The benefit of participation in this study is the knowledge you will gain about heart failure.

AUTHORIZATION

 If you sign this consent, you give permission to Jacenta Best and Iredell Memorial Hospital to use or disclose (release) your personal health information that identifies you for the research study described above.

The health information that we may use or disclose (release) for this research includes your medical history, age, race, and gender if relevant to the study.
The health information listed above may be used by and/or disclosed (released) to:
*The principal investigator and capstone advisor
*Iredell Memorial Hospital employees
*Other persons or agencies as required by law or allowed by federal regulations

Jacenta Best and Iredell Memorial Hospital are required by law to protect your health information. By signing this document, you authorize Jacenta Best and Iredell Memorial Hospital to use and/or disclose (release) your health information for this research. Those persons who receive your health information may not be required by Federal privacy laws (such as the Privacy Rule) to protect it and may share your information with others without your permission, if permitted by laws governing them.

Please note that you do not have to sign this Authorization, but if you do not, you might be ineligible to participate in the study. If you decide not to sign this authorization, it will not harm your relations with your doctors or with Iredell Memorial Hospital.

You may change your mind and revoke (take back) the Authorization at any time. Some of the data obtained from your record prior to your written revocation may still be used if considered necessary for the study. To revoke this Authorization, you must write to: the principal investigator, Jacenta Best BSN, RN at 557 Brookdale Drive Statesville, NC 28677.

This authorization does not have an expiration date. Additionally, the principal investigator and sponsor will keep your personal information for at least 6 years according to the guidelines for good clinical practice. If you do not withdraw this authorization in writing, it will remain in effect indefinitely.

QUESTIONS

Queens University of Charlotte wants to make sure that you are treated in a fair and respectful manner. Contact the University's Institutional Review Board (IRB) chair Dr. Laree Schoolmeesters at 704-337-2295 if you have any questions about how you have been treated as a study participant. If you have any questions about the project, please contact Capstone Advisor Dr. Grace Buttriss at 704-701-8187.

<u>CONSENT</u>

I have read the information in this consent form. I have had the chance to ask questions about this study, and those questions have been answered to my satisfaction. I agree to be in this study and authorize use of my personal health information. Jacenta A Best BSN, RN will provide me a copy of this form.

_____   _____
Patient [representative] Print Name   Date   Time

_____   _____
Patient [representative] Signature   Date   Time

_____   _____
Signature of Person Obtaining Consent   Date   Time

_____   _____
Investigator Signature   Date   Time

Appendix D

Phone Call Script

One week follow up Call Script:

Hello, I am the Clinical Nurse Leader student from Queens University Jacenta Best we met while you were a patient in Iredell Memorial Hospital. I am calling you regarding the heart failure project we started last week while you were at the hospital. I would like to complete the post heart failure questions with you. I will read each question to you and give you the choices listed. You will then respond by giving the answer that you think is correct. We will then review the questions that you may answer incorrectly or have questions about.

Do you have any questions or concerns you would like to address at this time?

Thank you for your participation in this study.

Appendix E

<u>Demographic Patient Information</u>

Name:

Phone number:

Patient number:

Age:

Race:

Gender:

Education Level:

Occupation:

Co-Morbidities:

Appendix F

Queens IRB Approval

QUEENS UNIVERSITY
OF CHARLOTTE

December 16, 2014

Jacenta Best
Presbyterian School of Nursing

RESEARCH PROTOCOL APPROVAL, IRB FILE # 10-14-PSON-0116

The Institutional Review Board reviewed your research request:

Effectiveness of Education in the Management of Adult Heart Failure

Your protocol (10/29/14); Informed consent form, Focus group questions, Questionnaire; and Recruitment materials were approved for use within the facilities of Queens University of Charlotte. The Board determined your study poses minimal risk to subjects and meets the criteria for an exempt application. If you plan to use the protocol outside of Queens University of Charlotte, you may need to submit it to the IRB at that institution for approval.

This approval expires one year minus one day from date above. Before your study expires, you must submit a notice of completion or a request for extension. You are required to report any changes to the research study to the IRB for approval prior to implementation. This form can be found on the IRB site on MyQueens and should be sent to irb@queens.edu.

If we can be of further assistance, please do not hesitate to contact us. Please use the IRB file number when referencing your case.

Sincerely,

Laree Schoolmeesters

Laree Schoolmeesters, PhD, RN, CNL
Chair, IRB

Appendix G

IRB Approval Letter

November 18, 2014

Jacenta Best, BSN, RN, MSN
Iredell Memorial Hospital
557 Brookdale Dr.
Statesville, NC 28677

Re: *Effective of Education in the Management of Adult Heart Failure* – The purpose of this evidence-based project is to gain understanding of patient's knowledge base of Heart Failure and improve education on Heart Failure.

Initial Approval Date: November 13, 2014
Expiration Date: November 18, 2015

Dear Jacenta Best,

On November 13th, 2014, the Iredell Memorial Hospital Institutional Review Board (IRB) reviewed the research proposal entitled, *Effective of Education in the Management of Adult Heart Failure.* The contingencies have been addressed and the IRB approves the protocol. Work on this project may begin. This approval is for a period of one year from the date of this letter and will require continuation approval if the research project extends beyond November 18, 2014.

If you make any changes to the protocol during the period of this approval, you must submit a revised protocol to the Iredell Memorial Hospital IRB for approval before implementing the changes.

We appreciate your interest in providing the benefits of health research to Iredell Memorial Hospital and its communities. If you have any questions regarding the IRB's decision, please contact:

Josh Welch, PharmD, CGP, Secretary- (704) 878-4599
Heather Kennedy, RN   Risk Management – (704) 878-4586

Sincerely,
Benjamin Dunlap MD, Chairman