The Congestive Heart Failure Nurse Development Project

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Abstract

One of the leading diagnoses for hospital 30-day readmissions is congestive heart failure. Closing gaps in nurses' knowledge and comfort level in congestive heart failure management principles can potentially contribute to improved patient knowledge and management in self-care of congestive heart failure, reduced congestive heart failure exacerbations, and reduced 30-day hospital readmission rate. The Congestive Heart Failure Nurse Development Project (CHFNDP) is a quasi-experimental project designed to improve non-cardiac nurses' knowledge and comfort levels in congestive heart failure management. The project occurred at an acute care academic medical center located in the Midwest. A convenience sample of 67 registered nurses from two medicine-nursing divisions were recruited to participate in a pre- and post-knowledge survey and comfort survey, view an online educational video presentation, and attend one live educational session on congestive heart failure management principles. Ten nurses completed the project. Outcomes of knowledge and comfort level were analyzed using the Wilcoxon Signed Rank Test. Overall pre-to post-nurses' knowledge mean scores remained the same ($Z = -.522$, $p = .602$), however pre-to post nurses' comfort mean scores improved ($Z = -5.223$, $p < .001$). In future studies, more educational opportunities can be provided to increase participants' memory and knowledge on congestive heart failure management principles to foster quality patient care.

Keywords: knowledge, comfort levels, congestive heart failure, and teach-back

The Congestive Heart Failure Nurse Development Project

Congestive heart failure (CHF) is a disease that affects ventricular contraction and can lead to several complications such as heart arrhythmias, myocardial infarction, valvular dysfunction, renal disease, and ultimately death (McMurray et al., 2012; Yancy et al., 2013). Nationally, CHF is responsible for 33% of hospital admissions with an average of 1 million hospital admissions annually (Hall, Levant, & DeFrances, 2012). Locally, the city of Saint Louis, Missouri had a total of 1,342 (per 10,000) CHF admissions for the year of 2013 (Missouri Department of Health & Senior Services, n.d.).

Decreasing the rate of CHF admissions and readmissions is a national and local healthcare goal. The Centers for Medicare and Medicaid Services (CMS) in conjunction with the Affordable Care Act has established the Hospital Readmission Reduction Program (HRRP) which penalizes hospitals for prematurely discharging patients (Centers for Medicare & Medicaid Services [CMS], 2016). Hospitals can receive a one to three percent penalty for 30-day readmission (CMS, 2016).

Dunlay et al. (2011) noted the lifetime costs for Medicare patients with CHF was $109,541 per person. Most costs stemmed from hospitalizations (Dunlay et al., 2011). As a result of increased health care costs and the need to provide quality care, the acute care academic medical center project site has implemented strategies to reduce the rate of 30-day readmissions. Strategies include ensuring patients have outpatient follow-up visits as well as implementing post-discharge follow-up phone calls.

McHugh and Ma (2013, p.8) confirm that improving nursing care may contribute to the reduction of hospital readmissions. Mahramus et al. (2013, p.198) assert decreased nurse knowledge can potentially result in incorrect patient education and incorrect self-care

interventions. Gemmill et al. (2011) declare nurses must have ongoing specialized education to maintain clinical competency. The student investigator developed the Congestive Heart Failure Nurse Development Project (CHFNDP) with emphasis in promoting and maintaining nurses' clinical competency in CHF management.

The project included two diverse groups of nurses. The first group consisted of nurse leaders who were instrumental in preparing the project for implementation. This group included the student investigator, a doctor of nursing practice (DNP) advisor, a DNP mentor, and a cardiology staff nurse. The second group included non-cardiac registered nurse participants from two medicine-nursing divisions. This group was diverse in age, gender, ethnicity, and number of years of nursing experience. In addition, there were differences in shift responsibilities such as time for weighing patients, day for weighing patients, frequency of vital signs, mode of obtaining vital signs, and nurse-patient ratio. Programs have shown that by incorporating diverse groups into professional development strategies, staff competencies can be improved (Douglas et al., 2014; McElroy, Smith-Miller, Madigan, & Li, 2016).

Problem, Purpose, Facilitators, and Barriers

Problem Statement

The problem addressed was non-cardiac nurses' lack of evidence-based knowledge and reduced comfort level in CHF management principles. Congestive heart failure management principles were defined as knowledge in medication management, dietary changes, fluid restrictions, weight control, symptomatology recognition, lifestyle modification, and teach-back (Appendix A).

Intended Improvement with Purpose

The primary purpose of the project was to determine if non-cardiac nurses' knowledge and comfort levels in CHF management principles improved with educational interventions. Evaluation of the efficacy of the interventions was measured using pre- and post-surveys.

Facilitators and Barriers

Several facilitators and barriers influenced the success of the project. Facilitators included an organizational environment that promotes professional education and has goals of reducing 30-day readmission rates. Also, a DNP mentor assisted the student investigator throughout the development of the project. Barriers for the project included nurses who did not enroll in the project and nurses who did not complete the project. Variables that may have contributed to nurses not completing the project include feeling overwhelmed with routine workload, time constraints, personal embarrassment in disclosing lack of knowledge or reduced comfort level, and failure to recognize a personal deficit in understanding CHF management principles (Appendix B).

Overall, the economic cost of the project was minimal, thus securing sustainability (Appendix C). If expanded over years, the project can be modified to include additional nursing divisions and patient feed-back on nursing care. Long-term outcomes can be measured and if shown to be beneficial, the project can be changed into an established program for the acute care academic medical center.

Review of the Evidence

PICOTS

The PICOTS question was, in non-cardiac nurses, does implementing education on CHF management principles compared to the current state of no formal educational program improve

non-cardiac nurses' knowledge and comfort levels in CHF patient management within three months at an acute care academic medical center?

Search Strategies

A systematic literature search was conducted in accordance with the PICOTS question. Databases searched included the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane, PubMed, and the National Guideline Clearing House. Also, the search engine Google Scholar was instrumental in performing the literature search. Keywords that were searched separately and in combination were *nurses, knowledge, confidence, competence, comfort levels, congestive heart failure, heart failure* and *teach-back*. In addition to utilizing databases, the reference section of each study was reviewed, and studies that supported the PICOTS were included in the search.

The synthesis of evidence included research studies published from 2002 through 2016 on the following topics: CHF guidelines; nurses' knowledge; self-efficacy, confidence, and comfort levels; and teach-back skills. Each study was critically appraised on the strength of scientific evidence based on Melnyk and Fineout-Overholt (2015) hierarchy of evidence rating system. The hierarchy of evidence ranges from Level I (strongest level) to Level VII (weakest level of evidence). Twenty-seven research studies were entered into the integrated review of literature including 6-Level I studies, 6-Level III studies, 9-Level IV studies, 5-Level VI studies, and 1-Level VII study (Appendix D).

Guidelines

A total of seven studies related to guidelines were included in the integrative review. Guidelines for CHF management are in place to assist patients and health care providers with decision making related to diagnostic testing, health care management, hospitalizations, and

promotion of quality of life (American Heart Association, 2010; Lainscak et al., 2011; McMurray et al., 2012; McKelvie et al., 2013). The New York Heart Association (NYHA) and the American College of Cardiology /American Heart Association(ACC/AHA) provide national guidelines for categorizing patients with congestive heart failure based on activity tolerance (Criteria Committee of the American Heart Association, 1994) and cardiac structure with symptomatology (Yancy et al., 2013). Athilingam et al. (2013) concluded the NYHA guidelines and the ACC/AHA guidelines have good predictive validity in assessing impaired patient cognition with disease progression. Conversely, Raphael et al. (2007) noted limitations in the NYHA guidelines and claim the classification system is subject to bias and lacks being reproducible.

Knowledge

A total of nine studies related to knowledge in CHF management principles were included in the integrative review. Understanding basic CHF principles is key to effective management and improvement in nurses' knowledge (Goodlin, Trupp, Bernhard, Grady, & Dracup, 2007; Roussel, 2015). Albert et al. (2002) identified six principle content areas vital in controlling CHF exacerbations including medication management, dietary changes, fluid restrictions, weight control, symptomatology recognition, and lifestyle modification.

Medication compliance. Several studies examined nurses' knowledge in CHF medications. Nurses scored high in understanding medications should be taken as directed (Albert et al., 2002; Washburn, Hornberger, Klutman, & Skinner, 2005; Delaney, Apostolidis, Lachapelle, & Fortinsky, 2011; Hart, Spiva, & Kimble, 2011; and Kalogirou, Lambrinou, Middleton, & Sourtzi, 2011), and mean scores ranged from 89.5% (Kalogirou et al., 2011) to 95.7% (Albert et al. (2002). Conversely, nurses scored low in understanding the importance of

avoiding non-steroidal anti-inflammatory medications (Albert et al., 2002; Washburn et al., 2005; Delaney et al., 2011; Hart et al., 2011; and Kalogirou et al., 2011) with mean scores ranging from 39.2% (Washburn et al., 2005) to 64% (Delaney et al., 2011).

Diet, fluid, and weight management. Low sodium diet, fluid restriction, and daily weight monitoring are essential to maintain quality life (Yancy et al., 2013). Nurses scored high in categories of understanding no added salt diet, fluid restrictions even when thirsty, and monitoring daily weight even when asymptomatic (Albert et al., 2002; Washburn et al., 2005; Delaney et al., 2011; Hart et al., 2011; Kalogirou et al., 2011; and Sterne, Grossman, Migliardi, & Swallow, 2014). Hart et al. (2011) found respective scores of 96.5%, 98.8%, and 90.7% for no added salt diet, fluid restrictions, and daily weight monitoring. While nurses had high mean scores in assessing daily weights, nurses had low mean scores in monitoring *dry* weight, monitoring three-pound weight gain without symptoms, and comparing daily weights (Washburn et al., 2005; Hart et al., 2011; and Sterne et al., 2014). Additional content areas that had low mean scores included avoiding potassium-based salt substitutes and avoiding lean deli meats (Albert et al., 2002, Washburn et al., 2005; Delaney et al., 2011; and Hart et al., 2011).

Symptomatology. Studies found that nurses had high symptomatology mean scores in content areas of new onset of fatigue, shortness of breath, decreased appetite, and abdominal swelling (Washburn et al., 2011; Hart et al., 2011; Kalogirou et al., 2011; and Sterne et al., 2014). Nurses had low mean scores in understanding the importance of transient dizziness (Washburn et al., 2011; Delaney et al., 2011; and Sterne et al., 2014). Sterne et al. (2014) noted 24% of nurses knew transient dizziness within 10-15 minutes after rising was an important symptom of worsening congestive heart failure.

Lifestyle modification. Lifestyle modification includes adhering to medication management, dietary changes, fluid restrictions, weight control, and exercise training (Albert et al., 2002). Studies have shown that nurses had low scores in understanding exercise management and in non-symptomatic blood pressure monitoring (Hart et al., 2011; Kalogirou et al., 2011). Hart et al. (2011) reported 68.6% of nurses correctly answered that patients with heart failure should not decrease activity nor avoid exercise. Albert et al. (2002) reported 26% of nurses understood that angiotensin-converting enzyme inhibitors (ACEIs) should be continued in non-symptomatic blood pressure of 80/50.

Self-efficacy, confidence, and comfort

Limited literature, six studies, discuss nurses' self-perceptions in managing patients with congestive heart failure. The concepts of self-efficacy, confidence, and comfort levels were incorporated into assessing health care providers' questions, fears, and ease in providing evidence-based patient care. Potter and Perry (2001) utilize the terms self-efficacy and self-confidence interchangeably and define as an individual's confidence in his/her ability to perform a health behavioral task. Albert et al. (2014) believe nurses should have a level of comfort in providing patient care and in delivering CHF patient education.

Due to limited studies that directly assess nurses' self-efficacy, confidence, and comfort levels in providing CHF management, a review of literature was conducted on the effects of organizational support, leadership empowerment, and individual opinions on perception of self-efficacy, confidence, and comfort levels. The review found health care provider's self-confidence was improved when appropriately trained (Le et al., 2015; Seale et al, 2012). Secondly, nurse leaders were identified as persons who can influence nursing staff to have positive self-efficacy (Manojlovich, 2005). Finally, confidence (Goodlin et al., 2007; Fry,

Chenoweth, MacGregor, Hyland, Payne, & Chenoweth, 2015; and Van Dyk, Siedlecki, & Fitzpatrick, 2016) and comfort levels (Albert et al., 2014) improve with years of nursing experience.

Teach-back

An integrative review of literature on six studies on teach-back was identified in recent publications. Teach-back (TB) is a method in which an instructor educates an individual on a topic and then confirms the individual understood what was taught via verbalization or demonstration (Rohyans, 2015). Train the trainer is a model by which a mentor teaches an individual on specific skills. Several studies have noted positive outcomes when nurses are trained on TB skills (Kornburger, Gibson, Sadowski, Maletta, & Klingbeil, 2013; and Mahramus et al., 2014). Fidyk, Ventura, and Green (2014) developed a multidirectional train the trainer curriculum composed of lecture, group interaction, role play, video, and panel discussion. An immediate post-survey and a 3-month post-survey revealed nurses had increased their use of TB methods (Fidyk et al., 2014). White, Garbez, Carroll, Brinker, and Howie-Esquivel (2013) conducted a study on CHF patients' knowledge retention when teach-back methods were used and found teach-back methods are an effective technique to assess patient understanding.

Peter et al. (2015) found 73% of nurses agreed teach-back methods were relevant to their work area. In addition, the investigators noted a 12% decrease in CHF patient readmission one-year post-patient teach-back interventions. Fredericks, Beanlands, Spalding, and Silva (2010) conducted a systematic review on educational interventions for CHF patients. The investigators concluded that written and audiovisual formats provided the most effective means for improving CHF patients' knowledge and self-care behaviors (Fredericks et al., 2010).

Theory

The transtheoretical model (TTM) operated as a theoretical framework to successfully guide nurses through this project. The TTM was created by Prochaska and DiClemente (1980s) with aims to modify high-risk behaviors (Prochaska & DiClemente, 1982). Three major constructs of the TTM are self-efficacy, decision balance, and the stages of change. Self-efficacy was adapted from Bandura (1977) and is defined as an individual's confidence in his or her ability to cope with high-risk behaviors without relapsing to unhealthy habits. Decision balance is the process in which an individual weighs potential pros and potential cons associated with changing high-risk behaviors. The stages of change are identified as six sequential steps which an individual experiences prior to successfully changing high-risk behaviors to healthy behaviors. Concepts identified within the stages of change are pre-contemplation, contemplation, preparation, action, maintenance, and determination. The authors acknowledge that individuals may regress to previous stages. Progression or regression through the stages is dependent on self-efficacy and decision balance (Prochaska & DiClemente, 1982).

Several studies have utilized the TTM to guide behavioral changes. Paradis, Cossette, Frasure-Smith, Heppell, and Guertin (2010) utilized the stages of change from the TTM to create a pilot study to increase patients' confidence in CHF self-care. McKee, Bannon, Kerins, and FitzGerald (2007) incorporated the TTM into a cardiac rehabilitation program that tracked patients' behaviors. The gathered study information was helpful in strategically assisting patients to modify diet, exercise, and stress (McKee et al., 2007). Although previous studies that used the TTM focused on patients, this project utilized the TTM as a theoretical framework to improve non-cardiac nurses' knowledge and comfort level in providing CHF patient management (Appendix E).

Methods

Institutional Review Board

The student investigator and the cardiology staff nurse (project team member) completed the Collaborative Institutional (CITI) training. Institutional Review Board (IRB) approval was granted by the affiliated university (Appendix F). In addition, the acute care academic medical center's research review committee granted the student investigator permission to conduct the project at the medical center's campus (Appendix G).

The likelihood of risk for harm was minimal as the project entailed pre-post surveys and educational interventions. All personal information, demographics, and survey scores were de-identified and stored in a secured electronic database, REDCap. Only the student investigator, the DNP faculty advisor, and the team member had access to REDCap. A conflict of interest was the student investigator and nurse participants provided care for patients on the two medicine-nursing divisions. To decrease risk of coercion, the student investigator did not approach nurses individually for recruitment purposes. The student investigator attended morning staff meetings to inform nurses of the project. Participation in the CHFNDP was strictly voluntary.

The costs for the CHFNDP were minimal. Indirect costs were $1,898 and direct costs were $408 (Appendix C). The student investigator did not receive funding for the project, thus compromise of ethics of the project was minimized. If the project is extended to incorporate patient-outcomes, a cost-savings analysis could be performed.

Setting and Participants

The setting for the CHFNDP was an acute care academic medical center that houses 1,314 staffed medicine and surgical beds with a total of 3,039 employed registered nurses. The CHFNDP included registered nurse participants on two non-cardiac nursing divisions governed by one nurse manager. Exclusion criteria were graduate nurses without licensure, travel nurses,

agency nurses, and float-pool nurses. There were a total of 67 nurses who met inclusion criteria and who were invited to participate in the project.

Evidence Based Intervention

The CHFNDP consisted of four phases (Appendix H; Appendix I). Phase I began early Fall 2016 with recruitment of nurses. Recruitment content included the name and contact phone number of the student investigator, purpose of the project, location of the project, criteria for eligibility, participation benefits, and time commitment (Appendix J). Recruitment was conducted via e-mail, posting of flyers, and communication to nurses at morning staff meetings. The project team member sent an initial e-mail inviting nurses to participate in the project. The project team member also sent bi-weekly reminders of upcoming activities. Nurses who had questions about the CHFNDP were instructed to contact the student investigator for more information.

Phase II. Waiver of documented consent and demographic information from nurses were obtained online through the electronic database REDCap. Nurses who chose to participate in the CHFNDP completed the online pre-knowledge and pre-comfort survey (Appendix K). Immediately following completion of the surveys, nurses had access to view the online video on CHF management principles via REDCap.

Phase III, IV. Nurses attended a 60-minute on-site educational session on CHF management principles. The live educational session provided nurses the opportunity to learn more about CHF in addition to participate in a question/answer forum. At the end of the live educational sessions, educational materials were distributed to participants (Appendix L; Appendix M). Phase IV began two weeks after nurses attended the live educational sessions.

This phase included nurses completing the post-knowledge and post-comfort surveys via REDCap.

Change Process, Evidence-Based Model

The TTM was used as a theoretical framework to support a change process directed in improving non-cardiac nurses' knowledge and comfort level in CHF management principles. In the first stage (precontemplation) nurses had not considered increasing knowledge and/or comfort levels in CHF management principles. In the second stage (contemplation), nurses became aware of personal deficits in knowledge and/or reduced comfort levels. In the third stage (preparation), nurses volunteered to take the knowledge survey, the comfort survey, and participate in educational interventions on CHF management principles. In the fourth and fifth stages (action and maintenance), nurses integrated CHF management principles into daily work routine. During the sixth stage (determination), nurses chose to complete or chose not to complete the post-knowledge survey and the post-comfort survey. In addition, nurses chose to continue or discontinue integrating CHF management principles into their work routine (see Appendix E).

The Stetler model was also integrated as an evidence-based practice model for the project. This model has a systematic approach that is instrumental in improving the practice environment by means of assessing local performances and measuring outcomes (Stetler, 1994). Five concepts of this model are preparation, validation, decision making, application/translation, and evaluation (Stetler, 1994). For the first phase (preparation), the student investigator completed a literature review on nurses' knowledge and comfort levels in CHF management principles. In the second phase (validation), evidence from the literature review was synthesized. The evidenced confirmed the need for nurses to improve knowledge and comfort levels in

clinical practice. For the third phase (decision making), permission to utilize and implement a knowledge and a comfort survey was obtained. During the fourth phase (application), nurses participated in taking a pre-and post-knowledge and comfort survey. In the final phase (evaluation), outcomes of the surveys were measured for statistical significance (Appendix N).

Study Design

The design of the CHFNDP was quasi-experimental, and data from the pre- and post-surveys were analyzed. The intervention was an educational program for non-cardiac nurses on CHF management principles. Nurses were required to participate in at least one of the educational interventions noted as (a) an online video or (b) a live educational session. Results from the surveys provided insight on statistical significance of nurses' knowledge and comfort levels in CHF management. The results determined if the educational interventions were acceptable methods in promoting outcome change in nurses' knowledge and comfort levels.

Validity

Internal validity. Internal validity of the CHFNDP was established in three instances. First, the project was aligned with recommendations from several CHF guidelines. Congestive heart failure guidelines support evidence-based clinical management in content areas of medications, diet, fluid, weight, and symptomatology (America Heart Failure Society, 2010; McMurray et al., 2012; Athilingam et al., 2013; and Lainscak et al., 2011). Second, the CHFNDP was aligned with previous studies that addressed nurses' knowledge in CHF management principles (Washburn et al., 2005; Delaney et al., 2011; Hart et al., 2011; and Sterne et al., 2014). Finally, the CHFNDP operationalized the concept of nurses' comfort level in the same way the comfort survey operationalized the concept comfort level (Albert et al., 2014).

Internal validity was compromised in two areas. First, participants in the project were not randomly selected thus increasing the risk of selection bias although all the nurses were invited to participate. Second, pre- and post-survey questions were given in the exact format thus increasing the risk of recall bias. It was difficult determining if outcomes were related to educational interventions or if outcomes were related to participants' recall of survey questions.

External validity. The CHFNDP has external validity in application to CHF knowledge and comfort in non-cardiac nurses. The project was created specifically for non-cardiac nurses located on two medicine-nursing divisions. However, the project has the potential of being extended to cardiac nursing divisions and to other non-cardiac medicine-nursing divisions that provide care for CHF patients.

External validity was also exercised as the CHFNDP was grounded in strategies that improved nurse's knowledge and comfort level. The two concepts, nurses' knowledge and nurses' comfort level, can be generalized to clinical practices that are specialized in other diseases. Specialized nursing divisions such as nephrology, oncology, or pulmonology can modify management principles from the CHFNDP to meet evidence-based management principles for their specific patient population.

Outcomes

The primary outcome measured was non-cardiac nurses' knowledge and comfort levels in CHF management principles from pre- to post-educational intervention. A secondary outcome measured was frequency by which nurses delivered patient education. An additional outcome that could be assessed but was not measured was the reliability of the two surveys.

Measurement Instrument

The two surveys are considered private and permission was obtained (Appendix K), and

the student investigator paid for the tools (Appendix C). The *Nurses' Knowledge of Heart Failure Educating Principle* survey (Albert et al., 2002) is a 20-item true-false instrument with specific questions that address diet, fluid, weight, medications, activities, and symptomatology. The validity of this tool was tested via face validity and content validity with a Kappa score of 0.70 (N. Albert, personal communication, March 21, 2016). Reliability was confirmed though a pilot study of expert nurses with an outcome of 100% (N. Albert, personal communication, March 21, 2016). In addition, multiple investigators have utilized this knowledge tool with similar outcomes, thus supporting reliability (Washburn et al., 2005; Delaney et al., 2011; and Hart et al., 2011). The Flesch-Kincaid Grade Level was 8.1 and the estimated time to complete the online version was seven minutes.

The *Nurses' Comfort Educating and Frequency Delivering Patient Education on Heart Failure Themes* survey (Albert et al., 2014) addresses two major themes: Comfort in Educating Patients (44-items), and Frequency Delivering Education (44-items). The first major theme of Comfort in Educating Patients utilizes a Likert scale that ranges from *very uncomfortable* (1) to *very comfortable* (7) in educating patients on heart failure. The second major theme Frequency Delivering Education also utilizes a Likert scale that ranges from *never educating patients before discharge* (0) to *always educating patients before discharge* (10). Statistical tests implemented for the *Nurses' Comfort Educating and Frequency Delivering Patient Education on Heart Failure Themes* survey included Pearson's correlation, sample *t*-test, and multi-variable regression. Each test had a significance level of 0.05 (Albert et al., 2014). The Flesch-Kincaid Grade Level of the comfort survey was 4.5 and the estimated time to complete the online version was seven minutes.

Quality of Data

The CHFNDP was prospective and included a cohort group of registered nurses (RNs). The total time-frame for collecting data was 12 weeks. Pre-surveys, followed by the online video, were accessible from September 6, 2016 through October 11, 2016. Participants were invited to attended one live educational session on either October 12th, 13th, or 15th. Post-surveys were accessible from November 1, 2016 through November 28, 2016. Data was collected and stored in the secure electronic database REDCap. Due to small sample size, power analysis was not established.

Analysis of Data

After participants completed surveys in the electronic database REDCap, results were placed on an excel spread sheet. These results were subsequently imported into SPSS for statistical analysis. Descriptive statistics included demographics of participants' age, highest nursing degree, number of years registered nurse (RN) experience, number of years employed on current nursing division, time of shift worked, and whether participants had previous employment on cardiology divisions.

The Wilcoxon Signed Rank Test was used to analyze outcomes for each survey question and overall tools. The two surveys utilized were (a) the *Nurses' Knowledge of Heart Failure* survey and (b) the *Nurses' Comfort Educating and Frequency Delivering Patient Education* survey. A *p*-value of 0.05 or less concluded a significant difference between results of the pre-surveys and post-surveys. Mean scores from the pre-surveys were compared against mean scores from the post-surveys.

Results

Setting and Participants

Study participants included RNs employed on two non-cardiac nursing divisions. The total population size was 67. The number of participants who started the pre-surveys was 18. The number of participants who completed the pre-surveys was 16. The number of participants who completed both pre- and post-surveys as well as participated in the educational program was ten. Due to small sample size, demographic results were not stratified. General information, however, was included. Mean participant age was 35, most participants had baccalaureate nursing degrees (61.1%), most were employed on current nursing division 1-5 years (44.4%), most had 1-5 years of nursing experience (50%), most worked the day shift (77.8%), and none of the participants were previously employed on cardiology divisions.

Intervention Course

An online educational video and several live educational sessions were accessible to participants who completed the pre-surveys. Of the 16 participants who completed the pre-surveys, 14 (87.5%) viewed the online video and 9 (56%) attended one of the live educational sessions. Only outcomes of participants who completed at least one educational intervention and both pre- and post-surveys were included in the results of the project (n=10).

Outcome Data by Subtopic

Knowledge. Overall, participants' knowledge on 11 questions improved post-educational interventions. The question with the most improved result was question #12 "If a patient wakes up at night with difficulty breathing, and the breathing difficulty is relieved by getting out of bed and moving around, this does not mean that the heart failure condition has worsened" (Appendix O). While respective pre-and post- scores improved for question #12, critical values did not elicit a statistically significant result (p=.317; Appendix O).

Comfort and Frequency. The second survey was divided into two major themes identified as (a) Comfort in Educating Patients and (b) Frequency in Delivering Education. Post-Comfort in Educating patient scores improved in all 44 questions; however, critical values did not elicit a statistically significant change. In this section, question #2 "Why taking a beta blocker" had the most improved results as evident by a p-value of .088 (Appendix P).

The second theme, Frequency Delivering Education, was evaluated on a Likert scale ranging from 0 to 10. Post- Frequency Delivering Education scores improved in 43 of the 44 questions. Moreover, there were 17 questions that had statistically significant scores with $p \leq 0.05$. Questions #21 "How to tell when exercising too much" and question #23 "Sexual activity" had the most significant critical value (p=.007; Appendix Q).

Missing data. Surveys were programmed in a manner by which participants had to complete each question in sequential order. Participants could not change answers once the participant had advanced to the next question. Participants also could not skip questions. During analysis of the surveys, it was found that question #1 on the pre- and the post-*Nurses' Comfort in and Frequency Delivering Education* survey was not answered by three participants. Although this question was not answered, the participants were able to advance to all other survey questions. Because the rest of the survey questions were answered, the three participants were included in the final project.

There was were a total of 18 participants who started the CHFNDP. Two participants did not complete the pre-surveys; therefore, they were excluded from the project. Five participants did not complete the post-surveys; therefore, they were excluded from the project. One participant did not participate in any of the educational interventions, thus was excluded from the project. A final count of 10 participants (n= 10) was included in the project.

Discussion

Success, Most Important

Although there were multiple challenges in the initial phase of the CHFNDP and a limited number of participants, this project was considered successful. First, overall post-mean scores of the *Nurses' Comfort Educating and Frequency Delivering Patient Education* survey were improved. Secondly, participants who attended the live educational sessions expressed personal appreciation in having their questions about evidenced-based CHF patient management answered. Although live sessions were scheduled for 60-minute time slots, each session lasted an additional 30-60 minutes secondary to participants' questions. Finally, several participants contacted the student investigator and shared personal strategies on how they implemented CHF patient teach-back strategies.

Study Strengths

The CHFNDP was implemented at an acute care academic medical center that is grounded in research and innovative teachings. The director of nursing, nurse manager, and IRB review committee were supportive of the project. One committee member suggested to incorporate the CHFNDP into the institution's Professional Nurse Development Program. In addition, the project team member was always available to send email reminders to the participants and contacted IT with problems with the secured online surveys.

Other strengths to the CHFNDP were related to the participants. First, anonymity of individual survey results was provided. Second, live educational sessions were voluntary, located at an off-site location, and were conducted in a manner that was non-threatening, yet informative. Third, participants learned rationales for specific diagnostics, medications, dietary restrictions, fluid/weight management, symptoms, and recommended exercises. Finally, during

the live sessions, participants were encouraged to brainstorm, have open dialogue, and ask questions.

Results compared to the Evidence in the Literature

Knowledge. Several published studies utilized the same *Nurses' Knowledge* survey to determine a baseline understanding of nurses' current knowledge in specific evidence-based CHF management content areas (Washburn et al., 2005; Delaney et al., 2011; Hart et al., 2011; and Kalogirou et al., 2011). Like published studies, the CHFNDP participants had *correct* pre-knowledge scores (≥ 90%) on questions # 7 "medication compliance", #19 "notifying provider of new onset or worsening fatigue", and # 20 "notifying provider of new onset of decreased ability to exercise" (Albert et al., 2002; Washburn et al., 2005; Delaney et al., 2011; Hart et al., 2011). Also like published studies, the CHFNDP participants had *incorrect* pre-knowledge scores (≤40%) on questions #15 "need to compare *dry* weight with daily weight", # 16 "correct monitoring of non-symptomatic low blood pressure", and # 18 "correct monitoring of symptomatic transient dizziness" (Appendix O).

Sterne et al. (2014) utilized the *Nurses' Knowledge* survey to evaluate nurses' knowledge pre- and post- educational interventions. The investigators provided results on each knowledge question as well as the overall results of the *Nurses' Knowledge* survey. In this study, overall nurses' knowledge improved post-educational interventions as evidence by a *p*-value <.001 (Sterne et al., 2014). Nurses had *incorrect* post-knowledge on questions #15 "the need to compare *dry* weight with daily weight" and question #16 "symptomatic transient dizziness". Participants in the CHFDNP had incorrect post-knowledge on the same questions with respective mean scores of 20% and 20% (Appendix O). Overall CHFNDP participant pre-to post-knowledge was unchanged as evident by a p-value of .602 (Appendix R).

Comfort and Frequency Survey. Albert et al. (2014) were the only investigators to implement the *Nurses' Comfort Educating and Frequency Delivering Patient Education* survey. The investigators standardized participants' results on a Likert scale of 0 to 100. Participants had highest comfort levels in the category daily weight monitoring (90%) and lowest comfort levels in the category activity and exercise (73%). With regards to the Frequency Delivering Education theme, Albert et al. (2014) found their participants had highest scores in the category of signs and symptoms of worsening condition (72%) and lowest scores in the category of activity and exercise (43%).

In contrast, the student investigator did not standardize results on the *Nurses' Comfort Educating and Frequency Delivering Patient Education* survey. Raw scores were based on the original survey Likert scale 1 to 7 for the Comfort in Educating Patients theme and the Likert scale 0 to10 for the Frequency Delivering Education theme. The CHFNDP participants had highest pre-comfort levels in the category daily weight monitoring (5.1) and had lowest pre-comfort levels in the category medications (4.5) (Appendix P). For the Frequency Delivering Education theme, CHFNDP participants had highest pre-frequency scores in the category of fluid restrictions (5.9) and had lowest pre-frequency scores in the category of activity and exercise (4.3) (Appendix Q).

Limitations

Validity. Several variables threaten internal and external validity. First, participants were not randomly selected. Second, the sample population size was small (n=10). Third, surveys were completed in an uncontrolled environment which could have resulted in participants assisting one another with survey questions, specifically questions on the knowledge survey. Fourth, there was missing data. Three participants did not complete question #1 on the pre-and

post- *Nurses' Comfort Educating and Frequency Delivering Patient Education* survey. Finally, the project took placed at a single acute care academic center, therefore limiting generalizability to other nursing divisions within the acute care academic center and other hospitals.

Sustainability. Several efforts were made to minimize bias and support sustainability of the project. A script was created and sent to participants via e-mail. To further reliability, only the student investigator attended morning staff meetings to inform nurses of the CHFNDP and to accurately answer questions related to the project. Homogeneity was established by only including participants who were licensed RNs and who worked on the two nursing divisions. Published studies have demonstrated that multiple educational interventions improve outcomes (Fredericks et al., 2010; Fidyk et al., 2014). The CHFNDP included two methods to educate participants. Both methods were solely created by the student investigator, tailored around evidence-based CHF management principles, and implemented only by the student investigator.

Interpretations

Expected and actual outcomes. There were expected and unexpected outcomes of the project. It was expected that participants who participated in the educational program and who took both surveys would have improved outcomes. Overall survey results improved in the *Nurses' Comfort Educating and Frequency Delivering Patient Education* survey (Appendix R). The post-mean scores for the Comfort in Educating Patients theme was 5.48 ($p < .001$) and the post-mean score for the Frequency Delivering Patient Education theme was 6.69 ($p < .001$).

There was an expectation that nurses' knowledge would have improved post-educational interventions. Overall the results of the *Nurses' Knowledge* survey did not demonstrate a significant change as evident of a post-mean score of .74 ($p = .602$) (Appendix R). It was also expected that CHFNDP participants' *Nurses' Comfort in and Frequency Delivering Patient*

Education survey pre-mean scores would have been similar to participants' mean scores in the study conducted by Albert et al. (2014). The outcomes varied in both studies.

Intervention's effectiveness (inferences). Sterne and colleagues implemented their study in one setting which included the pre-*Nurses' Knowledge* survey, viewing of a 30-minute powerpoint presentation, and completion of the post- *Nurses' Knowledge* survey (Sterne et al., 2014). Overall pre- to post- *Nurses' Knowledge* survey mean scores improved from 74 to 82 ($p \leq$ .001). Unlike Sterne and colleagues, the CHFNDP included two educational interventions. In addition, the timeframe of the CHFNDP was three months. Since post-surveys were provided two weeks after the close of the live educational sessions, participants in the CHFNDP may have forgotten information taught on evidence-based CHF management principles. Overall the CHFNDP participants' post- *Nurses' Knowledge* survey mean score was .74 $\pm$ .44 (Appendix R). To increase participants' memory and knowledge, educational opportunities can be extended to include monthly emails on evidence-based CHF management principles and more frequent live educational sessions.

Intervention revision. The Institute of Medicine recommends organizations to redesign health care systems and policies in a manner that will result in opportunities for nurses to improve clinical practice (Institute of Medicine, 2011, p. 11). The CHFNDP was designed to improve non-cardiac nurses' knowledge and comfort levels in evidence-based CHF management at a minimal cost. No funding was obtained and the expected money spent on the project aligned with the proposed budget. The total direct cost of the project was $408.00, thus securing economic sustainability.

Although the overall *Nurses' Knowledge* survey mean scores did not significantly improve, it is expected that with continued education that the nurses can become more

knowledgeable in evidence-based CHF management principles. There are several ways to improve nurses' knowledge and improve nurse participation in future studies related to this project. First, one should obtain permission to grant nurses Professional Nurse Development Program credit hours. Second, the project leader may recruit nurses from other non-cardiac divisions who provide care for patients diagnosed with congestive heart failure. Finally, the leader can recruit for a population size that will achieve a statistical significant power of .80. Long-term implementation of the CHFNP is expected to produce improved outcomes of non-cardiac nurses' knowledge, comfort level, and frequency in delivering education.

Conclusion

The CHFNDP was created to improve non-cardiac nurses' knowledge and comfort levels in CHF patient management. Educational interventions were practical and structured around evidence-based principles. Nurses who completed the pre-surveys had unlimited access to a 15-minute online video. Live educational sessions were designed to take place over 60 minutes. Pre- to post-knowledge level remained the same; however, nurses' comfort levels in CHF management principles improved. With review board approval, the CHFNDP can be extended to other cardiac and non-cardiac divisions at the acute care academic center. Educational interventions can also be incorporated into the Nurse Professional Development Program and into the Nurse Extern Program.

Dissemination of the CHFNDP abstract and poster was completed in 2016. The abstract and poster were presented on November 11, 2016 at the Advanced Practice Nurses of the Ozarks conference. A poster was presented on November 13, 2016 at the Society of Hospital Medicine conference. Poster detailing final outcomes of the project was presented at the UMKC Health Science Student Research Summit on April 26, 2017. Final abstract and poster presentation are

expected to be presented at the 11th Annual Barnes-Jewish Hospital Multidisciplinary Research Conference in October 2017. Presenting strategies and findings of the CHFNDP is expected to improve the quality of nursing care locally, regionally, and nationally.

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Appendix A

Definitions of Terms

1. Congestive heart failure management (CHF) Principles: Adhering to evidence-based recommendations for medications, diet, fluid, weight, symptomatology, lifestyle modification, and teach-back to decrease risk of CHF exacerbation.
2. Fluid balance: Limiting fluid intake to decrease risk of CHF exacerbation.
3. Lifestyle modifications: Adhering to medication management, dietary changes, fluid balance, weight control, exercise management, and smoking cessation to decrease risk of CHF exacerbation.
4. Medication management: Adhering to medication protocol to decrease risk of CHF exacerbation. Medication classes include angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers, beta blockers, calcium channel blockers, diuretics, inotropes, and vasodilators.
5. Nurses' comfort level: Feelings of confidence and ease in implementing CHF management principles.
6. Nurse's knowledge: Understanding CHF management principles to decrease risk of CHF exacerbation.
7. Symptomatology: Symptoms noted in acute CHF exacerbations including weight gain, edema, dizziness, fatigue, cough, chest discomfort, and activity intolerance.
8. Teach-back: Ability to teach patient or family on CHF management principles and confirm understanding via verbalization and/or demonstration.
9. Weight management: Controlling weight or identifying weight gain of 3 pounds in three days or 5 pounds in seven days.

Appendix B

Table 1
Logic Model

Inputs	**Intervention(s) Outputs**		**Outcomes -- Impact**		
	Activities	*Participation*	*Short*	*Medium*	*Long*
Evidence, sub-topics • CHF Guidelines • Nurses' Knowledge Survey • Nurses' Comfort Survey • Teach-Back **Major Facilitators or Contributors** • Doctor of Nursing Practice (DNP) student researcher • DNP instructor • DNP mentor • PhD social worker • Nurse scientist • Nurse manager • Project Team Member • Teaching hospital • Acute Care Medical Center with interest in decreasing 30-day re-admission rate. •Affordable Care Act and Medicare-Medicaid Services supports not fully reimbursing Medical Facilities for 30-day readmission. **Major Barriers or Challenges**	**EBP intervention which is supported by the evidence in the Input column** •Educate non-cardiac nurses CHF management principles. **Major steps of the intervention** • Pre- and post-*Nurses Knowledge* . survey •Pre- and Post-*Nurses Comfort in and Frequency Delivering Patient Education* survey. • Online educational video. • Live educational sessions. - Also encourage nurses to ask questions and verbalize concerns with implementing CHF management. - Instill excitement about increasing knowledge and comfort levels. - Remind nurses they are capable of critically thinking	**The participants (subjects)** • Non-cardiac nurse on two nursing divisions (both divisions have the same nurse manager). **Site** • Large acute care academic medical center. **Time Frame** •August 2016: Train project team member on REDCap. • September Recruit for upcoming Project, Pre-surveys, Online video. • October 2016 Live Educational Sessions • November: Post-surveys • December 2016: Organize data, conduct data analysis, analyze results. **Consent Needed or other** • Institutional Review Board Approval from University. •Review Board Approval from acute care medical center. •Clinical Nurse Director	**(Completed as student)** **Outcome(s) to be measured with valid & reliable tool(s)** • Change in nurses' knowledge in CHF management principles • Change in nurses' comfort level in providing CHF management. •Change in nurses' frequency in delivering patient-teach back in CHF management. •Determine if educational strategies were effective. **Statistical analysis to be used** • Wilcoxon Single Rank Test.	**(after student DNP)** **Outcomes to be measured** • Incorporate patient participation. - Provide knowledge survey. - Provide comfort survey. - Provide teach-back. - Provide feedback on hospital stay including perception of nursing care and education via surveys. • Post-discharge phone call to address concerns and briefly reassess knowledge and comfort in self-care. • Collect data on patient 30-day readmission. • Compare annual CHF readmissions. • Compare annual insurance reimbursement	**(after student DNP)** **Outcomes that are potentials** • DNP project changes to hospital program. - Implement educational sessions to other nursing divisions that provide care for CHF patients. - Incorporate CHFNDP into Professional Nurse Development Program. - Incorporate CHFNDP into Nurse Residency Program. - Monitor long-term CHF 30day readmission rate.

• Increase workload • Nurse fatigue • Fear (embarrassed) to admit to decreased knowledge and comfort levels. •Nurses reluctant to change old ways of practice. • Nurses may not recognize lack of knowledge in CHF Management Principles. • Attrition	through scenarios. - Remind nurses they are valuable providers of care.	and Nurse Manager Approvals to conduct project. •Participants' consent obtained via REDCap. **Person(s) collecting data** • Student Investigator. **Others directly involved** • DNP Mentor, Project team member, and Statistician.			

Appendix C

Table 2

Total Costs of Congestive Heart Failure Nurse Development Project

Direct Costs	**Cost of Items**
Knowledge Tool	$199.00
Comfort and Teach-Back Tool	$199.00
Educational Pocket Guide	$20.00
Total Direct Costs	***$408.00***
Indirect Costs	**Cost Items**
Doctor of Nursing Practice @ $55/hour for 10 hours	$660.00
Cardiology Staff Nurse @ $40/hour for 10 hours	$528.00
Stay Healthy Package	$25.00
Heart Healthy Diet Pamphlet	$25.00
Room Rental for Educational Sessions	**$250.00**
Total Indirect Costs	**$1898.00**
Total Direct and Indirect Costs	**$2,306.00**

Appendix D

Table 3
Synthesis of Evidence Table

	Year/Author	Topic[1]/Level[2] Research[3] Design	Purpose[4]/ Setting[5]/ Sample[6]	Inclusion/ Exclusion[7]	Method[8]/ Reliability[9]	Findings[10]	Limitations and Strengths[11]
1	**Author:** The Criteria Committee of the New York Heart Association **Year:** 1994 **Article:** *Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels*.	**Topic:** Guideline **Level:** Class VI **Design:** Descriptive Study Expert Opinion	**Purpose:** Classification system to assist physicians in describing the status of their patients with CHF. **Setting:** N/A **Sample:** Studies providing expert opinions	**Inclusion:** Evidence-based literature on CHF. **Exclusion:** Did not state	**Method:** Classified CHF based on symptomatology and diagnostics.	**Findings:** •Provides means of classifying patients based on objective assessment and provides recommendations for diagnostics and therapy. •Four Classes: -Class I -Class II -Class III -Class IV	**Limitations:** **Strengths:** •Provided a foundation to classify CHF for over 21 years.
2	**Year:** 2002 **Author:** Albert et al. **Article:**	**Topic:** Knowledge **Level:** Class VI **Design:**	**Purpose:** •Assess nurses' knowledge of heart failure (CHF)self-	**Inclusion:** •RNs •LPNs •Floor nurses •Home care	**Method:** •20-iterm true/false instrument (original authors). •Content areas with low	**Findings:** •CHF nurses (primary population) had higher scores	**Limits:** • Knowledge tool was not tested for reliability.

	Nurses' knowledge of heart failure education principles	Exploratory Descriptive Study	management education principles. **Setting:** •Midwestern health care system that included a university-based hospital, community hospitals, home care, and palliative care. Sample: •**n**= 300 Nurses who cared for CHF patients	•Palliative care •Critical care **Exclusion:** Did not state	scores of correct answers: 49% NSAIDS, 52% Potassium substitutes, 24% Dry weight, and 26% ACEI and low blood pressure **Reliability/Validity:** •Content and face validity. •Student t test • Fisher Exact Test • Scheffe multiple comparison. •ANOVA to determine differences between total scores and nurses' specialty areas. • the p-value was set at <.05.	compared to nurse in telemetry, critical care, and medical-surgical areas. • Home care nurses had higher scores compared to hospital and palliative care nurses •Nurses may lack proper education in CHF management principles. Improving nurses' knowledge may improve delivery of quality patient care.	•There was not a control and a experimental group. **Strengths** • One of the first tools to evaluate nurses' knowledge on CHF management principles •Large sample size
3	**Year:** 2005 **Author:** Manojlovich **Article:** *Promoting*	**Topic:** Self-Efficacy **Level:** Class IV **Design:**	**Purpose:** Assess if self-efficacy improves professional nursing behaviors **Setting:**	**Inclusion:** Nurses with various educational background form diploma	**Method**: Four Categories measured: • Three Structural empowerment scales • One Self-Efficacy	**Findings:** • Positive correlation between professional practice and	**Limits:** • While there are positive correlations between Empowerme

	nurse's self-efficacy. A leadership strategy to improve practice	Non-experimental correlational	Health care institutions in Michigan. **Sample**: **n** = 376 nurses (randomly selected from Michigan)	in nursing to doctorate in nursing **Exclusion:** Did not state	Scale •One Nursing Leadership Scale. • One Professional Practice Scale. **Reliability/Validity:** According to investigator •Moderate correlation between professional practice and structural empowerment ($r = 0.32$, $p < 0.01$) • Moderate correlation between professional practice and self-efficacy ($r= 0.45$, $p < 0.01$). • Strong correlation between nurse leadership and structural empowerment ($r = 0.64$, $P < .01$), • Cronbach's alpha was .90	structural empowerment •Positive correlation between professional practice and self-efficacy •Positive correlation between nurse leadership and structural empowerment.	nt and Self-Efficacy and positive correlation between empowerment and nurse leadership, the correlations (reliability) are moderate at best. **Strengths:** Strong positive correlation between nursing leadership and empowerment • Large sample size
4	**Year:** 2005 **Author:** Washburn, Hornberger, Klutman &	**Topic:** Knowledge **Level:** Class IV **Design:** Correlation	**Purpose:** • Examine nurses' knowledge in HF principles. **Setting:** Small hospital in	**Inclusion:** •ICU nurses •Medicine nurses • RNs •LPNs	**Method:** 20-items CHF Knowledge Survey (Albert et al., 2002) •Hand scoring of	**Findings:** •The mean knowledge scores of ICU nurses and medicine nurses	**Limits:** • Small sample size **Strengths:** • All participants

	Skinner **Article:** *Nurses' knowledge of heart failure education topics as reported in a small midwestern community hospital*	al Descriptive Study	the Mid-west region. **Sample:** **n=** 51 nurses (Convenience Sample)	**Exclusion:** Did not state	survey. • Mean score was 14.6 out of 20 with a percentage of 73%. •Content areas with low scores of correct answers: 41.2% Potassium substitutes, 37.3% Transient dizziness, and 19.6% .ACEIs no symptoms **Reliability/Validity:** Reliability not addressed.	were similar. • Survey scores ranged from 20% to 90% • Overall, nurses need to improve self-awareness in CHF management principles.	fully completed the survey. •Controlled environment.
5	**Year:** 2007 **Author:** Goodlin, Trupp, Bernhardt, Grady, & Dracup **Article:** *Development and evaluation of the Advanced Heart Failure Clinical Competence Survey: A tool to assess knowledge of*	**Topic:** Confidence Knowledge **Level:** Class VI **Design:** Descriptive Statistics	**Purpose:** Develop a tool to measure advanced knowledge in CHF care. **Setting:** Hospice nurses in Utah, New York, Texas, Florida, and Ohio. **Sample:** Convenience Sample • Expert CHF nurses **n**=36 expert CHF nurses, •Novice hospice	**Inclusion**: Expert CHF Nurses and Novice Hospice Nurses. **Exclusion:** Did not state	**Method:** Pilot Survey, Pilot testing, expert content validations. Final survey 54-item including true/false (25), multiple choice(11), and statements (18). **Reliability/Validity:** • Alpha Correlation: 0.78 for survey. • p- value: (<0.007) both Knowledge and Self-assessment tools •Additional Statistical tests include ANOVA, Chi-square and *t*-test.	**Findings:** • Overall, expert nurses had higher self-assessed competence levels and higher knowledge scores compared to novice hospice nurses. •Hospice Novice nurses had higher scores in the subcategories of dealing with	**Limits:** •Pilot survey •Small sample size •Failed to give actual scores. **Strengths:** Investigators developed a tool that had appropriate reliability and validity.

	heart failure care and self-assessed competence		nurses **n**=85			–coping, –bereavement, –dying	
6	**Author:** Raphael et al. **Year:** 2007 **Article:** *Limitations of the New York Heart Association functional classification system and self-reported walking distances in chronic heart failure*	**Topic:** Guideline critique **Level:** Class VI **Design:** Single Descriptive Case Study	**Purpose:** Determine if current systems that measure HF is useful compared to other techniques. **Setting:** A hospital in London and a Clinic in London. **Sample:** •30 Cardiologist and Trainees in Cardiology interviewed about the NYHA Classification System. •2 Cardiologist to test interoperator validity on 50 patients (**n** =34) •Convenience sample of CHF patients who self-reported walking	**Inclusion:** • Cardiologist and Trainees • 2 Cardiologist (did not state how obtained). •All CHF patients willing to participate and who attended an outpatient CHF Clinic. **Exclusion:** Did not state	**Method:** •30 Cardiologists and Trainees were interviewed about using the NYHA Classification system. •Interoperator variability performed using two cardiologists who classified 34 patients based on NYHA (Class II and Class III) • Assess patients' self-perception of distance walked. • Assessed patients' cardiopulmonary exercise testing **Reliability/Validity:** • Cohens Kappa, t-test, Spearman rank correlation.	**Findings:** • Cardiologist did not demonstrate consistent methods of assessing patients with CHF using the NYHA classification system. NYHA class. • Interoperator variability was 54%. • Possible that results (from interoperator) was due to chance. • Patients overestimated distance walked.	**Limitations:** •Small sample size of Cardiologists and Trainees interviewed. •Small sample size for Interoperator Validity. •Small sample size for assessing patients' self-reported distance walked. **Strengths:** • Assess multiple measures used to determine severity of CHF.

			distance.				
7	**Author:** America Heart Failure Society (HFSA) **Year:** 2010 **Article:** *Executive Summary: HFSA 2010 Comprehensive Heart Failure Practice Guideline*	**Topic:** Guideline **Level:** Class I **Design:** Systematic Review	**Purpose:** Provide a comprehensive CHF practice guideline. **Setting:** N/A **Sample:** •Scientific Studies •Clinical Trials •Expert Opinions	**Inclusion:** Evidence-based literature on CHF. **Exclusion:** Did not state	**Method:** • Utilized three grades (A, B, and C) to characterize the strength of evidence that support recommendations. -Grade A: RCT -Grade B: Cohort and Case-Controlled Studies, Post hoc, Subgroup analysis, and Meta-analysis -Grade C: Expert opinions and Observational studies. **Reliability/Validity:**	**Findings:** Recommendations for: Diagnostics, Pharmacological Therapies, Non-pharmacological therapies, Device Placements, Transplantation, and End of life care.	**Limitations:** **Strengths:** •Review of Literature that classified references based on a hierarchical system noted as Grade A,B, and C.
8	**Year:** 2010 **Author** Fredericks, Beanlands, Spalding, & Silva **Article** *Effects of the characteristics of teaching on the outcomes of heart failure patient education*	**Topic:** Teach Back **Level:** Class I **Design:** Systematic Review •Quasi-experimental Design	**Purpose**: Determine best method to improve patient education in HF. **Setting:** U.S./ Canada /UK **Sample:** Patients with HF. **n**=69 Studies **n**=1865 CHF Participants	**Inclusion:** •Adults >18 •Heart Failure •Educational •intervention •Outcome assessed SC Knowledge, Behavior, Symptom Experience **Exclusion:** Did not state	**Method**: Systematic review 69 studies with 1865 participants •Mostly Experimental and Control Groups •Other studies used one treatment group •Educational interventions included **a)**Written **b)** Video/Audio tape, **c)** Individual verbal discussions **d)**Group verbal	**Findings:** •Individualized pt. education •Multiple Sessions •Ed improved patient SC knowledge and performance of SC Behaviors •Audio & visual media were most effective in producing changes	**Limits:** **Strengths:** • Highest level of research •Research conducted in several countries • Most studies included experimental and controlled

	interventions: A systematic review				discussions **Reliability/Validity** Studies included education mode **a)**Written **b)** Video/Audio tape, **c)** Individual verbal discussions **d)**Group verbal discussions.	•Evidence suggest nurses should include a multi-interventional approach to teaching patient about CHF principles including suggest nurses should redesign their education initiatives to including one on one teachings, media resources, and paper copies on CHF.	groups.
9	**Year:** 2011 **Author:** Delaney, Apostolidis, Lachapelle, & Fortinsky **Article:** *Home care nurses' knowledge of evidence-based*	**Topic:** Knowledge **Level:** Class IV **Design** Cross sectional survey design	**Purpose:** Evaluate home care nurses' knowledge in evidence-based CHF management. **Setting:** 4 home care agencies in CT **Sample**: n=94 nurses	**Inclusion:** Home Health Nurses, LPNs and RNs **Exclusion:** Did not state	**Method:** 20-items CHF Knowledge Survey (Albert et al., 2002) •Primary Investigator met with Nurse Manager(NM) • NM distributed surveys to nurses. • Research team member collected completed surveys.	**Findings:** • Overall, nurses' knowledge was less than 80%. •Home health nurses are interest improving in knowledge	**Limits:** •Small sample size. Predominantly white participants **Strengths:** • Assessed nurses' knowledge in CHF content

	education topics for management of heart failure		(Convenience sample)		• Mean score was 78.0% (15.78 correct answers out of 20) • Content areas with low scores of correct answers: 64% NSAIDS, 29% Transient dizziness, %25 compare daily wt., 25% three- pound wt. gain, and 23% ACEIs and low blood pressure. **Reliability/Validity:** Using SPSS generates p-value of 0.05		
10	**Year:** 2011 **Author:** Hart, Spiva, & Kimble **Article:** *Nurses' knowledge of heart failure education principles survey: a psychometric study*	**Topic:** Knowledge **Level:** Class IV **Design** two phase non-experimental design	**Purpose:** Determine which version of Knowledge of Heart Failure Self-Management Education Principles Survey is better. Likert version or true/false (dichotomous) version. **Setting:** A healthcare	**Inclusion:** Acute care nurses, critical care nurses and cardiac telemetry nurses **Exclusion:** Did not state	**Method:** 20-items Knowledge Survey (Albert et al., 2002). • Comparison of the ºLikert Version ºDichotomous version **Reliability/Validity:** •Likert Version used Cronbach's alpha with first results of 0.53. Then 3 items were removed, producing a Cronbach's alpha of	**Findings:** •Likert version (0.70) was shown to be more reliable compared to Dichotomous version (0.27). • It should be noted that the investigators removed 3 items from the original version	**Limits** •Sample consisted mostly of White middle-aged females. •The investigators removed 3 items from the original tool. **Strengths:** •Addressed

			system located in the Southeastern USA **Sample:** N=122 (convenience sample) nurse participants.		0.70. •Dichotomous version used Kuder-Richardson method to evaluate internal consistency (0.27). •Test-retest reliability of the Likert scored survey was r = 0.66.		nurses' knowledge in CHF content area.
11	**Author:** Lainscak et al. **Year:** 2011 **Article:** *Self-care management of heart failure: Practical recommendations from the patient care committee of the Heart Failure Association of the European Society of Cardiology*	**Topic:** Guideline **Level:** Class I **Design:** Systematic Review	**Purpose:** •Provide evidence-based (EB) literature on Lifestyle management principles for patients with HF **Setting:** N/A **Sample:** Scientific Studies	**Inclusion:** Evidence-based literature on CHF **Exclusion** Did not State	**Method:** Assessed recommendations on: Symptoms, Self-Care, Fluid and Sodium Management, Nutrition and Weight, Smoking and Alcohol, Physical Activity and Sex, Immunization, Depression, and Sleep Disorder. **Reliability/Validity:** Not applicable	**Findings:** Patients and caregivers should be aware of: •Warning signs and be prepared to take action •Professionals should provide comprehensive CHF education •Limit fluid to 1.5-2 liters per day, restrict sodium, and daily weight. • patients who are cachectic should have protein	**Limitations:** •Limited data on statistical findings. **Strength:** •Systematic review.

						nutritional support •Weight loss in obese patients. •evidence does not show adverse effects associated with alcohol. •Physical activity has benefits in quality of life. •Nocturnal pulse oximetry can assist in determining sleep apnea.	
12	**Year:** 2012 **Author:** Kalogirou, Lambrinou, Middleton, & Sourtzi **Article:** *Cypriot nurses' knowledge of heart failure self-*	**Topic:** Knowledge **Level:** Class IV **Design** Cross-sectional survey	**Purpose:** Determine nurses' knowledge in CHF management principles. **Setting:** All 5 public urban hospitals in Cyprus. **Sample:** **n**=143 nurses (Convenience	**Inclusion:** ICU nurses, cardiac ward nurses and internal medicine ward nurses **Exclusion:** Did not state	**Method:** 20-items CHF Knowledge Questionnaire (Albert et al., 2002) •Content areas with low scores of correct answers: 16% Compare daily wt. and 29.3% ACEIs and low blood pressure **Reliability/Validity:** Reliability not	**Findings:** The observed mean score was 13.57 out of 20 questions (67.8% on a scale to 100%), with a standard deviation of 2.33.	**Limits** • Did not assess pre-post educational interventions. **Strengths** •Addressed nurses' knowledge in CHF content area.

	management principles		sample)		addressed		•Moderate sample size.
13	**Author:** McMurray et al. **Year:** 2012 **Article:** ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012.	**Topic:** Guidelines **Level:** Class I **Design:** Systematic Review	**Purpose:** •Provide evidence-based management for CHF. • Assist health care providers with decisions in managing CHF. manage CHF patients. **Setting:** N/A **Sample:** Review of literature	**Inclusion:** Evidence-based (EB) literature on CHF. **Exclusion:** Did not state	**Method:** • Collection of EB literature to assist in providing care for CHF patients. • Synthesis of Literature. Classified patients into 4 categories (A, B, C, D) based on strength of evidence. Evidence was weighted -Level A: Multiple RCTs and meta-analysis -Level B: Singe RCT or large non-randomized studies. -Level C: Expert opinions, retrospective studies, small studies, and registries. **Reliability/Validity:** Did not state	**Findings:** Discussed: •Definitions for CHF, •Symptomatology, •Diagnostics, •Pharmacological therapies • Device Placements • End of life care	**Limitations:** •Systematic Review
14	**Author:** Athilingam et al. **Year:** 2013 **Article:**	**Topic:** Guideline **Level:** IV **Design:** Case-	**Purpose:** •Examine how predictive the NYHA and the ACC/AHA are in classifying CHF	**Inclusion:** CHF Adults **Exclusion:** • Alzheimer •Transplant list	**Method:** •Functional ability of NYHA and ACC/AHA was measured using 6-minute walk test (6MWT)	**Findings:** •Both NYHA and ACC/AHA had inverse correlation with physical activity	**Limitations:** •Patients in the ACC/AHA category had echocardiogr

	Predictive validity of NYHA and ACC/AHA classifications of physical and cognitive functioning in heart failure	Control, Cross-sectional Correlational Design	based on physical activity and cognitive function. **Setting:** Does not state. Sample collected from Cardiology Office and University Hospital. **Sample:** 90 Community dwelling CHF adults residing at home.	•Home Oxygen •Ventricular assist device. •Palliative or Hospice •History of Stroke.	•Cognitive impairment of NYHA and ACC/AHA was measured using the Montreal Cognitive Assessment (MoCA) tool. **Reliability/Validity:** Spearman Rho correlation coefficients • NYHA correlation with Cognitive fxn (RS = -0.232, p=0.028) •NYHA correlation with 6MWT (RS= -.298, p=0.004) •ACC/AHA correlation with (RS = -0.258, p=0.014) • ACC/AHA correlation with 6MWT (RS= -.178, p=0.093).	(6MWT) and Cognitive function. • NYHA was more predictive (as evidence by results) in appropriately classifying HF compared to ACC/AHA.	ams that were retrospective from previous 6 months instead of having current echocardiogram.
15	**Year:** 2013 **Authors:** Kornburger, Gibson, Sadowski, Maletta, & Klingbeil **Article:** *Using "Teach-Back" to*	**Topic:** Teach Back **Level** Class VII **Design:** Evidence-based Project	**Purpose:** Development of and Eval on EBP project to improve d/c process **Setting:** Midwest Children Wisconsin hospital **Sample:**	**Inclusion:** Pediatric Staff Nurses **Exclusion:** Did not state	**Methods:** •Pre- and Post-Survey •Review of Literature **a)**Eval pt. and family satisfaction survey; **b)** Champions attend Pfizer Health literacy conference; **c)** Champions developed Ed intervention for nrs on	**Findings:** Teaching materials awarded by the Educational Dept. or Sophie Schroder Foundation *Post Survey showed: **a)** increase	**Limitations:** •Unable to directly evaluate pt. outcomes •Reliability/ Validity not addressed

	promote a safe transition from hospital to home: An evidence-based approach to improving the discharge process		**n=53** pediatric nurses (Convenience sample)		TB; **d)** Nrs provided a 5-step TB intervention (see pg. 284) **e)**Nurse pre-survey on health lit & TB-->Ed patients **Reliability/Validity:** Not Addressed	knowledge on HL **b)** increase knowledge on TB interventions **c)** 98% of 51 nrs staff agreed TB helps pt./Family understand d/c instruction •**Sustainability**: this institution now requires all new hired RNs to be taught on TB and plans to roll-out to other units	
16	**Author:** McKelvie et al. **Year:** 2013 **Article:** *The 2012 Canadian Cardiovascular Society Heart Failure Management guidelines update: Focus*	**Topic:** Guideline **Level:** Class I **Design:** • Primary and Secondary Panels •Systematic Reviews	**Purpose:** Examine strategies and provide updated evidence n CHF management principles. **Setting:** N/A **Sample:** •Scientific Studies	**Inclusion:** Evidence-based literature on CHF **Exclusion:** Did not state	**Method:** •Modified previous Guideline based on input of Stakeholders. •Cited references for rationale of modifications including study trials. • Synthesis of Literature. Classified/Grade literature based on significance ranging	**Findings:** Provided a list of recommendations for •Diagnostics •Pharmacological Therapies •Non-Pharmacological therapies •Device Placements.	**Limitations:** •Limited statistical findings. **Strengths:** •Review of Literature that classified references based on a hierarchical system from

	on acute and chronic heart failure				from High, Moderate, and Low.		high to low.
17	**Year:** 2013 **Author:** White, Garbez, Maureen, Brinker, Howie-Esquivel ***Article:*** *Is "teach-back" associated with knowledge retention and hospital readmission in hospitalized heart failure patients**?"***	**Topic:** Teach back **Level:** Class IV **Design:** Prospective Cohort Study design	**Purpose:** Examine if TB methods: •Improved patients' retention of self-care management principles and •Effect the number of CHF readmissions. **Setting:** Hospital **Sample:** **n**=276 CHF patients	**Inclusion:** 65 years or older patients admitted to cardiology or medicine floor. **Exclusion:** Did not state	**Method:** •Two nurses specialized in CHF educated patients on TB and provided handouts. Average time spent on TB was 34 minute. • Follow-up contact with patient 7 days after discharge and Recall was assessed. **Reliability/Validity:** Reliability not addressed	**Findings:** •Positive correlation between the amount of time providing TB and patients answering questions correctly. •No correlation between patient's answering CHF questions correctly and decreased CHF readmissions. .	**Limits** • No control group •There were only four questions that were asked (name of diuretic, weight gain to report, high salt foods, and symptoms of exacerbation. There were no questions on activity and other medications specific of CHF.
18	**Author:** Yancy et al. **Year:** 2013 **Article:** *2013*	**Topic:** Guidelines **Level:** Class I **Design:** Systematic	**Purpose:** Address multiple management issues for the adult patient with CHF.	**Inclusion:** •Scientific Studies •Study Review **Exclusion:**	**Method:** • Systematic review of literature which assist in providing guidelines for Cardiovascular Disease.	**Findings:** Recommendations for •Diagnostics •Pharmacological Therapies	**Limitations: Strengths:** •Comprehensive recommendations for

	ACCF/AHA Guideline for the Management of Heart Failure A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines	Review of Literature	**Setting:** N/A **Sample:** •Scientific Studies •Study Reviews •Other Evidence published in databases relevant to the guideline	Did not state	• Categorized level of evidence of literature into Class I, Class IIa, Class IIb, Class III no benefit, and Class III harm **Reliability/Validity:**	•Non-Pharmacological therapies •Device Placements •Transplantation •Palliative care.	classifying and treating congestive heart failure.
19	**Year:** 2014 Author: Albert et al. **Article:** *Hospital nurses' comfort in and frequency of delivering heart failure self-care education*	**Topic:** Comfort and Frequency **Level:** Class IV **Design**: Multicenter, Descriptive, Correlational design	**Purpose:** Assess the frequency nurses educate patients on CHF management principles and assess nurses' comfort levels in CHF management principles. **Setting:** Three hospitals **Sample:** **n**=118 Cardiac and non-cardiac nurses	**Inclusion:** Cardiac and non-cardiac nurses who worked days/nights on floor. **Exclusion:** Did not state	**Methods:** •Demographics • Likert-type Comfort Level. •Likert-type Education Frequency Survey. **Reliability/Validity:** G*Power 3.1.7 To calculate sample size (needed 68 participants, study had xxx participants). •Alpha=0.05 •Power of 0.95 •Pearson Correlation.	**Findings:** Overall, cardiology nurses felt comfortable educating CHF patients. • Positive correlation between comfort level and time spent educating patients. • Although	**Limits:** •Mostly Female nurses. **Strengths:** •Addressed Nurses' knowledge and comfort in CHF management principles.

			(Convenience sample)			nurses may feel comfortable in certain content areas, the frequency in educating patients remains lower than expected. education. • Educational tools for patients included handouts and videos.	
20	**Year:** 2014 **Authors:** Fidyk, Venura, & Green **Article:** *Teaching Nurses how to teach*	**Topic:** Teach-back **Level:** Class VI **Design:** •Pilot Study •Post Survey •Quality and Quantitative study	**Purpose:** Develop a program that will teach nurses how to execute teach-back (TB) strategies. **Setting:** Medicine and Surgical nursing division at hospital **Sample**: **n=**15 Clinical Nurses (Non-Random Sample)	**Inclusion:** Medicine nurses and Surgical nurses **Exclusion:** Did not state	**Methods:** * Four TB methods: **a)** Didactic of lecture/group interactions; **b)** Video; **c)** Role Play; **d)** Panel Discussion *Nurses evaluated the pilot study. •Nurses highly motivated and displayed intention to change behaviors were the results.	**Findings:** • Nurses implemented TB more frequently immediately after intervention and 3months post intervention. • Expected frequency of using TB was overall lower than investigator's	**Limits:** •Pilot study • Reliability and Validity were about the surveys were not discussed.

					Reliability/Validity: Reliability not addressed •Gives results of course/study	prediction.	
21	**2014** Fry, Chenoweth, MacGregor, Hylan, Payne,& Chenoweth *Emergency nurses' perceptions of the role of confidence, self-efficacy and reflexivity in managing the cognitively impaired older person in pain*	**Topic:** Confidence **Level:** Class III **Design:** Multicenter Descriptive	**Purpose:** Aimed to explore emergency nurses confidence and self-efficacy in caring for cognitive impaired older persons who presented with pain from a long bone fracture. **Setting:** Four Emergency Departments in Sydney Australia **Sample:** •Purposive Sampling of •**n=** 80 ED Nurses (with 16 focus groups).	**Inclusion:** One year of Emergency room Experience **Exclusion:** Did not state	**Method:** •Focus Group Interviews •15-items with 2 Likert-type questions and 12 open-ended questions. **Reliability/Validity:** •Thematic Analysis •However does not state statistical data	**Findings:** Data suggested that a nurses' experience of confidence and self-efficacy was significantly associated with practice and knowledge. • Less experienced nurses needed to acquire relevant knowledge and confidence in the care of elderly with deficits in cognition.	**Limits:** •Small sample size •Descriptive data **Strengths:** •Begins to address self-efficacy and confidence in providing care for elderly patients in pain and who may have cognitive impairment.
22	**Year:** 2014 **Author:**	**Topic:** Knowledge **Level:**	**Purpose:** **Setting:** Tertiary Hospital	**Inclusion:** RNs **Exclusion:**	**Method:** •Nurses' Knowledge of Heart Failure	**Findings:** Comprehensive educational	**Limits** •Decreasing sample sizes

	Mahramus, Aragon, Frewin, Chamberlain, & Sole **Article:** *Assessment of an educational intervention on nurses' knowledge and retention of heart failure self-care principles and the Teach Back method*	Class III **Design** Cohort Quasi-experimental Design	System: •Four Adult Inpatient units in three hospitals and •Home Health Department. **Sample:** • Initial 250 RNs Convenience Sample •150 RNs pre-and post-test •61 RNs completed 3-month f/u	Did not state	Educational Principles (NKHFEP) tool developed by Albert et al. • Teach-Back Tool •Educational Classes **Reliability/Validity:** •250 RNs attended educational classes •150 RNs completed immediate pre- and post-test following the class •61 RNs completed 3-month follow-up •IBM SPSS version 18 •ANOVA •MANOVA • p<.001	program on CHF SC principles and TB also with regular reinforcement after the program resulted in improved nurses' knowledge and retention over time. •Passing score set at >85% • Pre-test passing 6% •Immediate Post-test passing 41.3% •88.5% three-months Post-test	•Small sample size **Strengths** •Study attempted to follow same group of RNs.
23	**Year:** 2014 **Author:** Sterne, Grossman, Migliardi, & Swallow **Article:** *Nurses'*	**Topic:** Knowledge **Level:** Class III **Design:** Quasi-experimental	**Purpose:** Assess nurse's knowledge post-educational program on heart failure and evaluated the 30-day re-admission **Setting:**	**Inclusion:** RNs **Exclusion:** Did not state	**Method:** • Knowledge Survey (Albert et al., 2002) • PowerPoint presentation •Teach-back training **Reliability/Validity:** •SPSS version 19 •Paired sample t-test	**Findings:** • Findings showed statistically significant increase in nurses' posttest scores (p<.001) • One open-	**Limits** • Small sample size and single institution. • Short time frame from pretest to posttest

	knowledge of heart failure: implications for decreasing 30-day re-admission rates		200 bed community hospital in Northeast United States. **Sample:** **n**= 45 RNs (Convenience sample)		showed a statistically significant difference (p<.001) • MANOVA and Bivariate Analysis •Mean pre-test 73.8% •Mean post-test82% •30-day readmission rate prior to program was 25.4% •30-day readmission rate post-program 9%.	ended question suggest nurses felt discharge instructions on diet, medications, fluid, and weight were important.	(20minutes) could sensitize participants improved scores (internal threat to validity).
24	**Year:** 2015 **Authors:** Le, Johns, Seale, Woodall, Clark, Parish,& Miller **Article:** *Primary care residents lack comfort and experience with alcohol screening and brief intervention: A multi-site survey*	**Topic:** Confidence **Level:** Class III **Design:** Cross-sectional Survey	**Purpose:** Identify barriers that effect medicine residents implementing alcohol screenings. **Setting:** Medicine Residency Programs located Utah, South Carolina, & North Carolina **Sample**: 210 medicine residents (Convenience sample)	**Inclusion:** •U.S. and Non-U.S. Medical residents who live in Utah, South Carolina, North Carolina **Exclusion:** Did not state	**Method:** •Pre-Survey •Invitation to enroll in a training program **Reliability/Validity:** •Multivariable logistic regression based on residents' characteristics (race/country of birth/ age/religion/family hx of alcohol/ residency program/ and residency years). • p<.001 • Pearson CHi Square Test with Adjusted OR (95% CI)	**Findings:** •Medicine residents programs rarely use tools that screen for hazardous drinking habits in patients. •Positive correlation between confidence and implementing alcohol screen. •Correlation between religious faith, confidence, and implementation of alcohol	**Limits:** •Rely on self-report of residents.

						screen. .	
25	**Year:** 2015 **Authors:** Peter et al. **Article:** *Reducing readmissions using teach-back: Enhancing patient and family education*	**Topic:** Teach-Back, **Level:** Class IV **Design:** Patient Experiment and Control Group	**Purpose:** Decrease the number of CHF readmissions through a teach-back (TB) program. **Setting:** 951-bed Magnet facility in Pennsylvania • Sample #1**:** Health care members **n**=137 Train the Trainer on TB • Sample #2: Patients/Families **n=**180 patients received education on TB	**Inclusion:** •Educational Team (ET) consisting of 12 groups of health professionals •Patients and caregivers **Exclusion:** Did not state	**Methods:** • Train the Trainer program. –Two-phase educational series, and ET provided support to nurses regarding questions. –Trainer implements patient/family TB. –Nurses identified patients and family to participate in TB. •Patients asked 4 questions each day to evaluate HF understanding. –Questions based on three categories including knowledge, attitude, and behaviors. **Reliability:** Reliability not addressed	**Findings:** • Nurses were inconsistently documenting patient/family education. • Nurses were not consistently performing patient-centered education.. •Nurse documentation compliance increased from 45% to 90% •12% decrease in HF readmit over one year	**Limits:** •Discusses findings but does not address reliability or validity •Does not discuss gender/race **Strength:** Large sample size
26	**Year:** 2015 **Author:** Roussel **Article:** *Improving*	**Topic:** Knowledge **Level:** Class III **Design:** Quasi-	**Purpose:** •Determine if HF education improved cardiac nurses knowledge •Relationship btw	**Inclusion:** Cardiac nurses **Exclusion:** Did not state	**Method:** •Pre-and Post-survey with a 54-item Likert Survey. 2-4weeks between two surveys. •Powerpoint	**Findings:** •Knowledge deficit in CHF management principles. •Some nurses	•Non-randomized study. •Environment for conducting

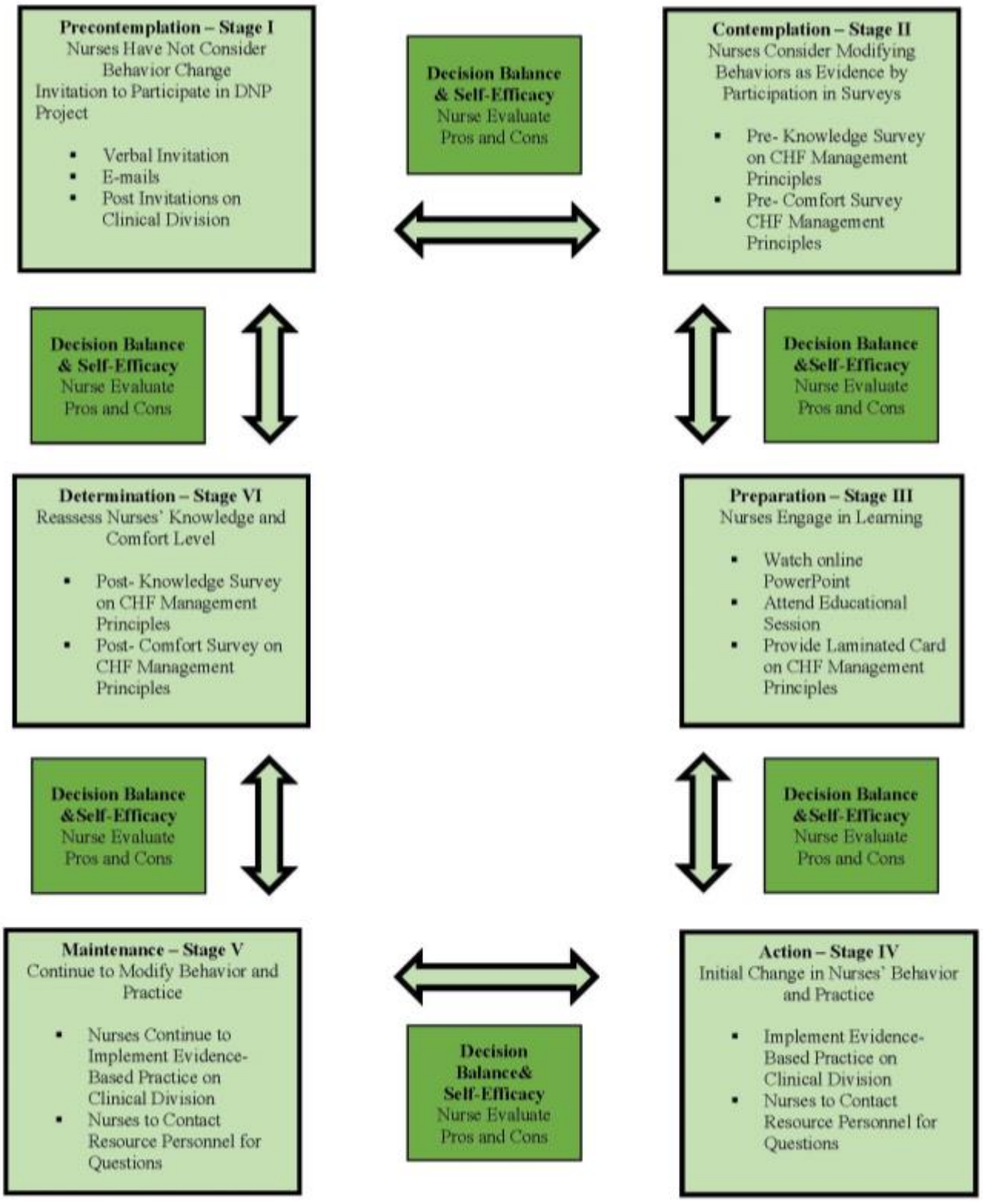
	nurses' knowledge of heart failure.	Experiment	nurses' Self-assessment of knowledge of HF and Actual knowledge of HF. **Setting:** Heart and Vascular Center of a large academic medical center **Sample:** **n**= 55 CHF nurses (Convenience sample)		presentation was used as an educational tool in between pre-and post-surveys. **Reliability/Validity:** •Face Validity •Power Analysis •Knowledge scores improved from pre-test (25.6) and post-test (27.30) with noted p=.001 education •No significant relationship btw self-assessment and actual knowledge pre (p=0.778) and post (p=0.551) • Moderately strong positive correlation btw nurses' perception of self-competence with palliative care and years of nursing experience (r=0.735, p=.001)	had false perception knowledge in CHF management principles. •Powerpoint presentation improved knowledge scores.	the study was not controlled. •Nurses were given education during work day. There were multiple interruptions during this educational period.
27	**Year:** 2016 **Authors:** Van Dyk, Siedlecki, & Fitzpatrick **Article**	**Topic:** Confidence **Level:** Class III **Design**: Descriptive Correlation	**Purpose:** Examine the number of years of experience, confidence, and self-efficacy in nurse managers.	**Inclusion:** Current role as nurse manager **Exclusion:** Did not state	**Method**: •30-item tool called *Work Self-Efficacy Inventory***.** •15-item tool called *Nurse Manger Confidence* Survey.	**Findings:** Strong positive correlation btw years in leadership role and the self-efficacy	**Limits:** •Small sample size **Strengths:** • Nurse managers from nine

	Frontline nurse managers' confidence and self-efficacy	al Design	**Setting:** Nine Midwest hospitals (within a specific health care system) **Sample:** **n**=85 Nurse managers (Convenience sample)		**Reliability and Validity** •Pearson's correlation •Hierarchical multiple regression	*r*=0.675.	facilities.

ACEIs = Angiotensin-Converting Enzyme Inhibitors
CHF= Congestive Heart Failure
HF= Heart Failure (CHF and HF are used synonymously)
Ed = Education
N/A = Not Applicable
NSAIDS =Non-Steroidal Anti-inflammatory Medications
NYHA= New York Heart Association
Pt. = Patient
RCT = Random Control Trials
SC = Self-Care
Wt. = Weight
1 Topic
2. Hierarchy Level per Melnyk & Fineout-Overholt (2015)
3. Research Design
4. Purpose
5. Setting
6. Sample
7. Inclusion/Exclusion
8. Method
9. Reliability
10. Findings
11. Limitations and Strengths

Appendix E

Congestive Heart Failure Nurse Development Project and The Transtheoretical Model
Adapted from Prochaska and DiClemente



Appendix F

Approval Letter from Institutional Review Board

UMKC School of Nursing and Health Studies

July 6, 2016

Members of UMKC Institutional Review Board
University of Missouri-Kansas City
Kansas City, MO 64108

UMKC IRB,

This letter serves to provide documentation regarding Lisa Gill's Doctor of Nursing Practice (DNP) Project proposal. Ms. Gill obtained approval for her project proposal, The Congestive Heart Failure Nurse Development Project, from the School of Nursing DNP faculty committee on July 6, 2016.

If I can provide any further information, please feel free to contact me.

Sincerely,

Susan J. Kimble

Susan J. Kimble, DNP, RN, ANP-BC, FAANP
Clinical Associate Professor
DNP Programs Director
UMKC School of Nursing and Health Studies
816-235-5962
kimbles@umkc.edu

Appendix G

Approval Letter from Project Site Review Board Committee

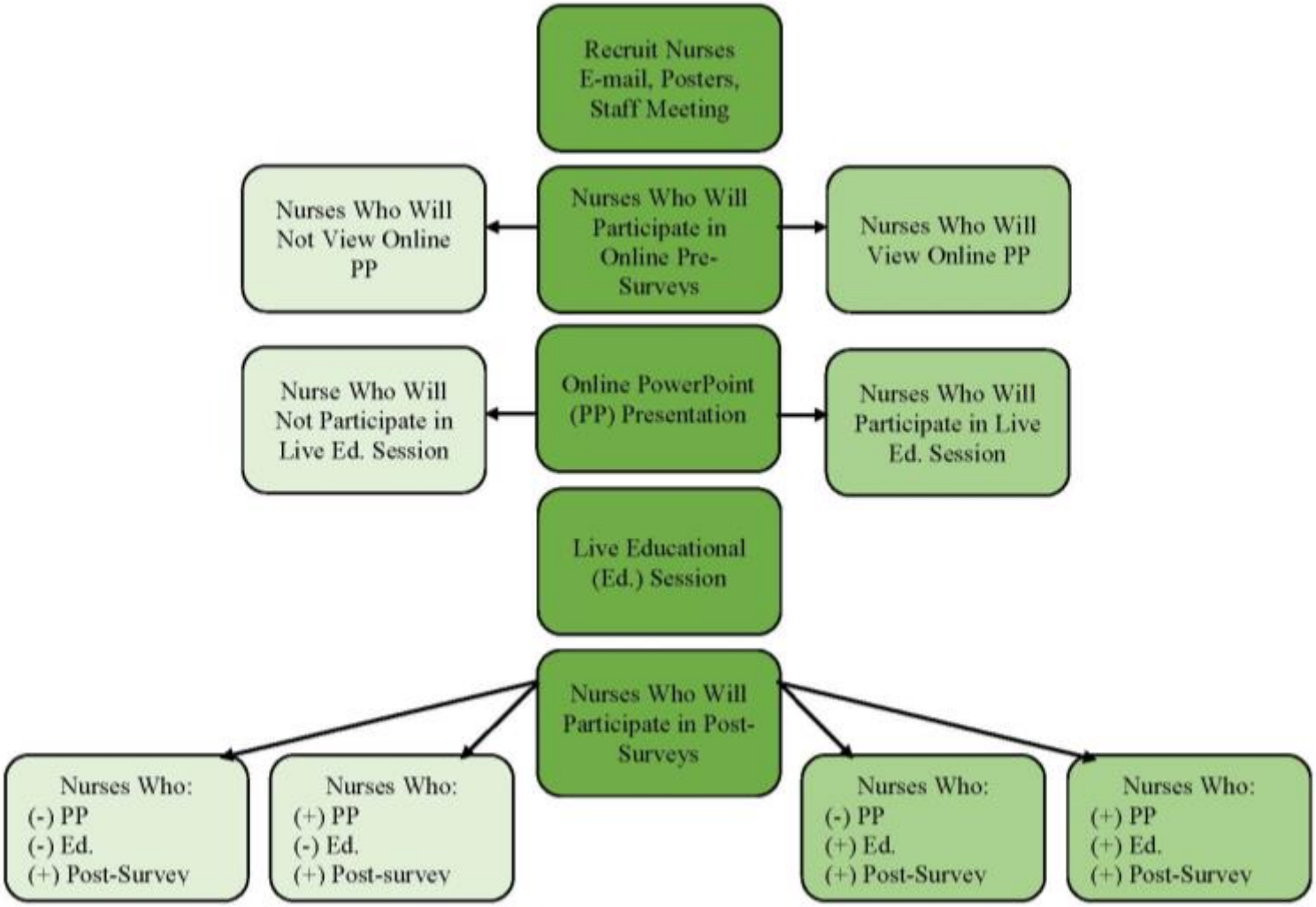
Appendix H

Table 4
Project Time Line and Dates 2016

April	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
•Contact Nurse Scientist (NS) and Doctor of nursing practice (DNP) mentor for Guidance with: - Hospital protocol - Project Recommendations.	•Monthly Meeting with NS and DNP mentors. •Contact Information Technology (IT) regarding posting educational PowerPoint presentation.	•Monthly Meeting with NS and DNP mentors. •Develop Educational PowerPoint •Continue Communicate with IT. • Prepare and Submit Potential DNP Project to IRB.	•Monthly Meeting with NS and DNP mentors. •Communicate with IT •Await IRB Approval.	•Monthly Meeting with NS and DNP mentors. •Communicate with IT. • Recruit Nurses. E-mail, post flyers, attend staff meeting.	•Monthly Meeting with NS and DNP mentors. •Obtain informed consent, • Nurses participate in pre-surveys and power-point presentation.	•Monthly Meeting with NS and DNP mentors. •Live educational sessions. • Post Surveys.	•Monthly Meeting with NS and DNP mentors. • Collection of Data and data analysis.	•Monthly Meeting with NS and DNP mentors. •Interpretation of Data.

Appendix I

Interventional Flow Sheet



Appendix J

Project Flyer

UMKC
School of Nursing and Health Studies

University of Missouri – Kansas City

Registered Nurse Volunteers from Divisions 10100 and 10200 Wanted for IRB Approved Research Study

conducted by

UMKC Doctor of Nursing Practice Student

_____

The Congestive Heart Failure Nurse Development Project

You are invited to participate in the Congestive Heart Failure Nurse Development Project (CHFNDP), a research study. The purpose of the CHFNDP is to determine if educational interventions impact nurses' knowledge and comfort levels in congestive heart failure management principles.

Nurses who are eligible:

Licensed registered nurses who work on divisions 10100 and 10200.

Start Date: Fall 2016

.

Participation will include:

- Two online Pre- and Post-Surveys (7 minutes each).
- One online PowerPoint Presentation (30 minutes).
- One Live Educational Session (60 minutes) start time 1700.

All nurses will be eligible for a raffle of movie gift certificates.

To learn more information about this study please contact Lisa M. Gill at

Appendix K

Permission to Utilize Survey tools

Appendix L

Educational Pocket Card for Nurses

Diagnostics	Meds	Diet/Fluid/Weight
1. Vital Signs. 2. Intake/Output every 4hours. 3. Daily Weight 4. BNP, BMP, CBC 5. Chest X-Ray. 6. Echocardiogram.	1. ACEIs: "Pril". 2. ARBs: "Artan". 3. BB: "Lol". 4. Vasodilators. 5. Diuretics. 6. Digoxin. 7. AVOID NSAIDS.	1. Sodium ≤2000mg daily 2. No Potassium Substitutes 3. Limit Fluid intake 1800mL daily. 4. Report 3 lb. wt. gain in one day. 5. Report 5 lb. wt. gain in one week.
Patient Symptoms	**Clinical Symptoms**	**Lifestyle**
1. Shortness of Breath 2. Cough 3. Edema 4. Abdominal Distention 5. Chest Pain 6. Heart Palpitations	1. Jugular Venous Distention. 2. Tachycardia. 3. Coarse Breath Sounds. 4. Hepatomegaly.	1. Smoking Cessation. 2. Tobacco Cessation. 3. Exercise: a. 5-minute Warm-up. b. 20-minute Exercise. c. 5-minute Cool Down.

Systolic Dysfunction: Poor Pump (Impaired Ventricular Contraction)
Diastolic Dysfunction: Poor Relaxation (Impaired Ventricular Relaxation)
Patient Teach-Back Questions
1. What is the name of your diuretic? 2. What are the names of your heart medicines? 3. How often should you weigh yourself? 4. How should you weigh yourself? 5. What is the maximum amount of salt you can eat in one day? 6. If your weight increases by _ pounds in one day, then you should call your provider. 7. If your weight increases by _pounds in one week, then you should call your provider. 8. What are symptoms that your heart failure is getting worse? SOB, Cough, Edema, CP, Palpitations, Abdominal Swelling, Dizzy, and Fatigue.

References

Criteria Committee of the New York Heart Association (1994). *Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels* (253-256). Boston, Mass: Little, Brown & Company

Heart Failure Society of America, (2010). Executive Summary: HFSA 2010 Comprehensive Heart Failure Practice Guideline. *Journal of Cardiac Failure*, *16*(6), 475–539. http://doi.org/10.1016/j.cardfail.2010.04.005

Rohyans, L. (2015). Preparing the patient for discharge. In L. Smith (Ed.), *Evidence-Based Strategies for Reducing 30 Day Readmissions* (19-30). Mt. Laurel, NJ.: American Association of Heart Failure Nurses

Appendix M

Educational Content

I. National Statistics
   - A. 1 Million Hospitalizations Annually (Hall, Levant, & DeFrances, 2012).
   - B. Medicare Lifetime Cost (Dunlay et al., 2011).
   - C. Hospital Readmission Reduction Program (Centers for Medicare & Medicaid Services, 2016).

II. New York Heart Association Functional Classification for Congestive Heart Failure (Criteria Committee of the New York Heart Association, 1994).
   - A. Class I
     1. Disease but Without Symptoms.
     2. No Limitations with Activity.
   - B. Class II (Mild)
     1. Disease with Mild Symptoms.
     2. Slight Limitation of Physical Activity. Comfortable at Rest.
   - C. Class III (Moderate)
     1. Disease with Moderate Symptoms.
     2. Marked Limitations of Physical Activity.
   - D. Class IV (Severe)
     1. Disease with Severe Symptoms (At Rest).
     2. Unable to Care Out Physical Activity Without Discomfort.

III. Definition of Congestive Heart Failure (Rohyans, 2015).
   - A. Systolic Dysfunction
     1. Poor Pump.
     2. Left Ventricular Ejection Fraction (LVEF) Less Than 40%.
   - B. Diastolic Dysfunction
     1. Impaired Relaxation.
     2. Thick Myocardial Wall.

IV. Clinical Manifestations: Patient (Rohyans, 2015).
   - A. Shortness of Breath.
   - B. Persistent Cough.
   - C. Edema .
   - D. Abdominal Distention.
   - E. Lack of Appetite/Nausea.
   - F. Confusion.
   - G. Chest Pain and/or Palpitations.

V. Diagnostics (Heart Failure Society of America [HFSA], 2010).
   - A. Vital Signs, Intake, Output, and Weight.
   - B. Serum Labs
     1. BNP, BMP, and CB.C

C. Chest X-Ray.
D. Transthoracic Echocardiogram.

VI. Physical Assessment: Health Care Provider (Rohyans, 2015)
A. Jugular Venous Distention (JVD).
B. Hepatosplenomegaly.
C. Right Upper Quadrant Tenderness.
D. Coarse Breath Sounds.
E. Tachycardia.

VII. Pharmacological Therapies (HFSA, 2010).
A. ACEIs: Captopril, Enalapril, and Lisinopril.
B. ARBS: Losartan.
C. Beta Blockers: Metoprolol and Carvedilol.
D. Vasodilators: Isosorbide mononitrate/dinitrate and Hydralazine.
E. Diuretics: Furosemide, Bumetanide, Diuril, and Spironolactone.
F. Digoxin.

VIII. Non-Pharmacological Therapies (HFSA, 2010).
A. Diet
1. Sodium Intake 2000-3000mg Daily.
2. Look for Food Labels that contain the words “Salt, Sodium, Monosodium Glutamate (MSG)”.
3. “Don’t Pass the Salt Please”.
B. Fluid
1. 2-3 pounds in One Day.
2. 5 Pounds in One Week.
C. Activity
1. Flexibility Exercises.
2. Aerobic Exercises.
3. Strengthening Exercises.

IX. Patient Teach-Back (Rohyans, 2015).
A. Medications
1. ACEIs, ARB, BB, and Vasodilators.
2. Side Effects

B. Symptomatology
1. Shortness of Breath
2. Chest Pain Palpitation
3. Transient Dizziness
C. Lifestyle Modification
1. Exercise Limit Alcohol Consumption, and Smoking Cessation.

References

Centers for Medicare and Medicaid Services. (2016). Readmissions Reduction Program. Retrieved from https://www.cms.gov/medicare/medicare-fee-for-service-payment/acuteinpatientpps/readmissions-reduction-program.html

Criteria Committee of the New York Heart Association (1994). *Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels* (253-256). Boston, Mass: Little, Brown & Company.

Dunlay, S. M., Shah, N. D., Shi, Q., Morlan, B., VanHouten, H., Long, K. H., & Roger, V. L. (2011). Lifetime costs of medical care after heart failure diagnosis. *Circulation: Cardiovascular Quality and Outcomes*, *4*(1), 68–75. doi:10.1161/CIRCOUTCOMES.110.957225

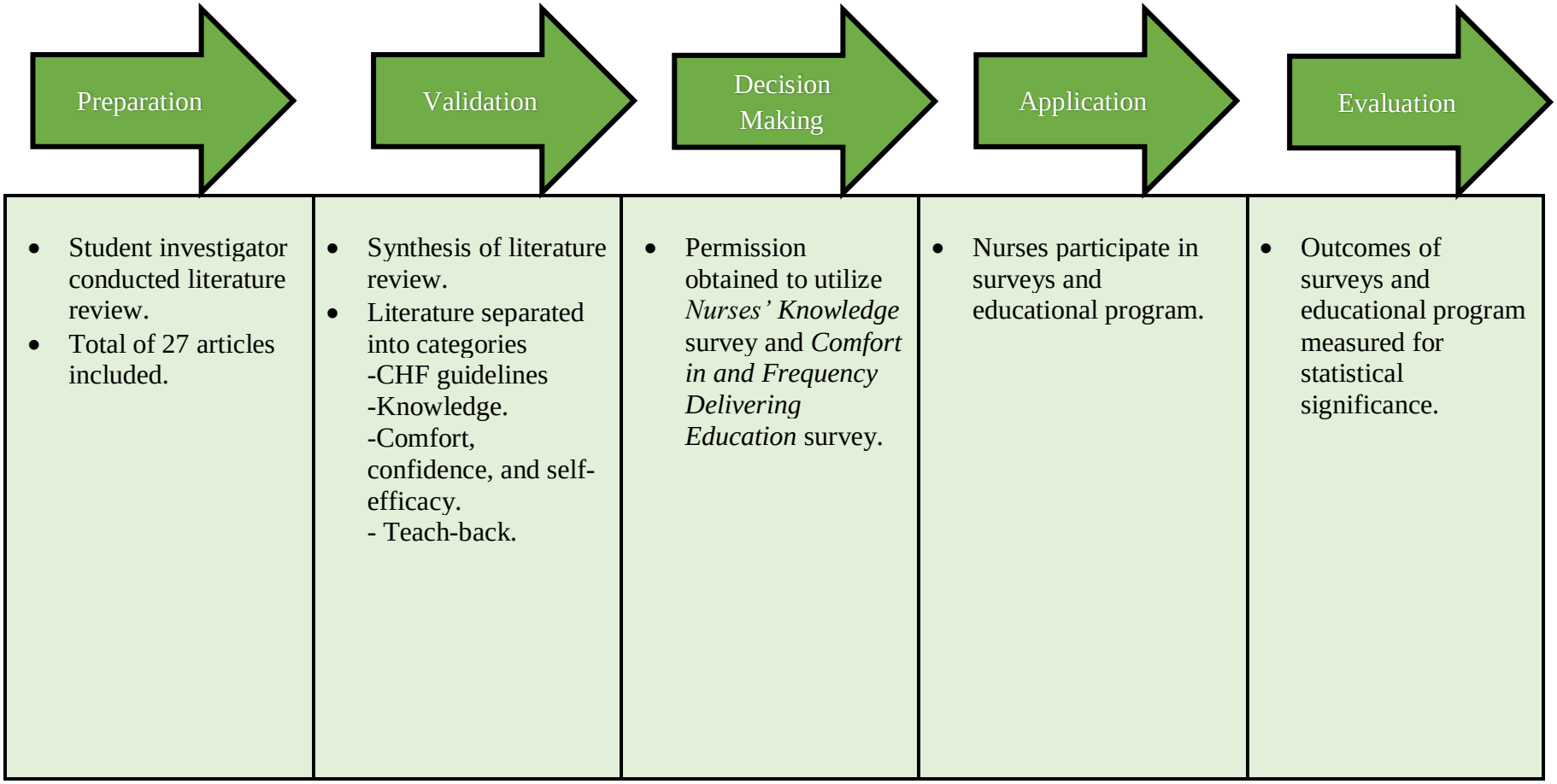
Hall, M. J., Levant, S., & DeFrances, C. J. (2012). Hospitalization for congestive heart failure: United States, 2000-2010. *NCHS Data Brief*, (108), 1–8. United States, 2000-2012. National Center for Health Statistics

Heart Failure Society of America, (2010). Executive Summary: HFSA 2010 Comprehensive Heart Failure Practice Guideline. *Journal of Cardiac Failure*, *16*(6), 475–539. http://doi.org/10.1016/j.cardfail.2010.04.005

Rohyans, L. (2015). Preparing the patient for discharge. In L. Smith (Ed.), *Evidence-Based Strategies for Reducing 30 Day Readmissions* (19-30). Mt. Laurel, NJ.: American Association of Heart Failure Nurses.

Appendix N

Adaptation of the Stetler Model



Appendix O

Knowledge Question Mean Scores

Table 5
Pre- and Post- Knowledge Question Mean Scores

	Questions	Pre	Post	Z-Score	p-Value
1.	Patients with heart failure should drink plenty of fluids each day.	0.9	1.0	-1.000	0.317
2.	As long as no salt is added to foods, there are no dietary restrictions for patients with heart failure.	1.0	1.0	.000	1
3.	Coughing and nausea/poor appetite are common symptoms of advanced heart failure.	0.9	0.9	.000	1
4.	Patients with heart failure should decrease activity and most forms of active exercise should be avoided	0.8	0.9	-.577	0.564
5.	If the patient gains more than 3 pounds in 48 hours without other heart failure symptoms, they should not be concern.	0.9	0.7	-1.414	0.157
6.	Swelling of the abdomen may indicate retention of excess fluid due to worsening heart failure.	0.7	0.9	-1.414	0.157
7.	If patients take their medications as directed and follow the suggested lifestyle modifications, their heart failure condition will not return.	1.0	1.0	.000	1
8.	When patients have aches and pains, aspirin and non-steroidal anti-inflammatory drugs (NSAIDS like ibuprofen) should not be recommended.	0.5	0.3	-1.342	0.18
9.	It is OK to use potassium-based salt substitute (like No-Salt or Salt-Sense) to season food	0.4	0.5	-1.000	0.317
10.	If patients feel thirsty, it is OK to remove fluid limits and allow them to drink. -	1.0	1.0	.000	1
11.	When a patient adds extra pillows at night to relieve shortness of breath, this does not mean that the heart failure condition has worsened	0.9	1.0	-1.000	0.317
12.	If a patient wakes up at night with difficulty breathing, and the breathing difficulty is relieved by getting out of bed and moving around, this does not mean that the heart failure condition has worsened	0.7	0.9	-1.000	0.317
13.	Lean deli meats are an acceptable food choice as part of the patient's diet -	0.5	0.4	-1.000	0.317
14.	Once the patient's heart failure symptoms are gone, there is no need for obtaining daily weights	1.0	1.0	.000	1
15.	When assessing weight results, today's weight should be compared with the patient's daily weight from 0terday, not the patient's ideal or dry weight	0.1	0.2	-.577	0.564
16.	BP Recording of 80/56 without any heart failure symptoms.	0.1	0.2	-.577	0.564
17.	Weight gain of 3 pounds in 5 days without symptoms.	0.7	0.6	-1.000	0.317
18.	Dizziness or lightheartedness when arising that disappears within 5 minutes. -	0.3	0.4	-.577	0.564
19.	New onset of worsening of fatigue.	0.9	1.0	-1.000	0.317
20.	New onset of worsening leg weakness or decreased ability to exercise	0.9	1.0	-1.000	0.317

Appendix P

Comfort Question Mean Scores

Table 6
Pre- and Post- Comfort Question Mean Scores

	Questions	Pre	Post	Z-Score	p-value
	Medications	**4.5**	***5.4***	***-3.057***	***.002***
1	Why take an angiotensin converting enzyme inhibitor (ACE-I) OR an angiotensin receptor blocker (ARB).	3.9	5.2	-1.630	0.103
2	Why taking a beta-blocker.	4.4	5.5	-1.706	0.088
3	Why taking a loop diuretic (like furosemide).	5.0	5.6	-.690	0.49
4	Why taking digoxin.	5.1	5.4	-.318	0.75
5	Why taking an aldosterone inhibitor.	4.3	5.1	-1.039	0.299
6	Why taking warfarin, if in atrial fibrillation.	5.0	5.7	-.343	0.732
7	Why taking aspirin.	5.1	5.7	-.343	0.732
8	Expected effects of taking a beta-blocker.	4.6	5.6	-1.236	0.216
9	Adverse effects from taking a beta blocker.	4.5	5.5	-1.382	0.167
10	Adverse effects of taking an ACE-I.	4.5	5.4	-1.103	0.27
	Low Sodium Diet	***4.8***	***5.5***	***-2.110***	***.035***
11	Why maintain a 2000mg/day sodium diet.	4.5	5.6	-1.140	0.254
12	How to identify sodium in packaged foods.	5.2	5.7	-.893	0.372
13	How to read food labels.	5.0	5.8	-.686	0.493
14	How to decrease sodium intake at restaurants.	4.7	5.5	-.898	0.369
15	How to decrease sodium intake when snacking.	4.6	5.6	-1.127	0.26
16	How to decrease sodium when at relatives	4.7	5.5	-1.058	0.29
17	What salt substitutes are OK to use.	4.8	5.1	-.682	0.495
	Activity and Exercise	***5.0***	***5.4***	***-1.619***	***.106***
18	Why exercise.	4.9	5.6	-.666	0.506
19	Types of exercises/activities recommended.	5.3	5.4	-.566	0.572
20	Types of exercises/activities to avoid.	5.0	5.4	-.994	0.32
21	How to tell when exercising too much.	5.2	5.5	-.638	0.524
22	What to do if you become fatigued while exercising.	4.7	5.6	-1.109	0.268
23	Sexual activity.	4.9	5.2	-.514	0.607
	Fluid Restrictions	***5.0***	***5.5***	***-1.031***	***.030***
24	Why restrict fluids.	4.9	5.5	-.542	0.588
25	Steps to measure and monitor fluid intake.	5.1	5.5	-.597	0.551
26	What counts as fluids.	4.7	5.5	-.986	0.324
	Signs and Symptoms of Worsening Condition	***4.7***	***5.5***	***-1.811***	***.070***
27	Why it is important to monitor self. -	4.6	5.6	-1.194	0.233
28	What to look for.	4.5	5.5	-1.275	0.202
29	How often to monitor signs/symptoms	4.8	5.4	-.604	0.546
30	When to notify someone of worsening condition.	4.8	5.5	-.851	0.395
	Daily Weight Monitoring	***5.1***	***5.5***	***-.683***	***.495***
31	Why weigh self daily.	5.1	5.6	-.531	0.595
32	Procedure for weighing self.	5.2	5.5	-.341	0.733
33	When to report weight to doctor/nurse.	4.8	5.4	-.494	0.621
34	What to report when speaking to doctor/nurse.	4.9	5.5	-.612	0.541
	Signs and Symptoms of Fluid Overload	***4.7***	***5.5***	***-1.731***	***.083***
35	Why it is important to monitor for fluid overload.	4.8	5.5	-.957	0.339
36	What to look for.	4.8	5.5	-.863	0.388
37	How often to monitor for fluid overload.	4.8	5.4	-.568	0.57
38	When to notify someone of increasing fluid levels.	4.5	5.6	-1.409	0.159
	Heart Failure Beliefs	***4.7***	***5.5***	***-2.203***	***.028***
39	What causes heart failure.	4.5	5.5	-1.194	0.233
40	What does heart failure mean.	4.5	5.5	-1.147	0.251
41	Heart failure is chronic/debilitating.	4.7	5.4	-.599	0.549
42	Heart failure may shorten life/cause premature death.	4.6	5.5	-1.147	0.251
43	Heart failure can be controlled by lifestyle actions.	4.8	5.8	-1.349	0.177
44	Regular office visits are important even when feeling fine.	5.0	5.8	-1.054	0.292

Appendix Q

Frequency Question Mean Scores

Table 7

Pre-and Post- Frequency Question Mean Scores

	Questions	Pre	Post	Z-Score	p-value
	Medications	***5.5***	***6.7***	***-4.638***	***≤ .001***
1	Why take an angiotensin converting enzyme inhibitor (ACE-I) OR an angiotensin receptor blocker (ARB).	4.4	5.8	-1.473	0.141
2	Why taking a beta-blocker.	5.7	6.5	-1.452	0.146
3	Why taking a loop diuretic (like furosemide).	6.4	7.0	-1.133	0.257
4	Why taking digoxin.	5.4	6.3	-1.380	0.168
5	Why taking an aldosterone inhibitor.	4.5	6.4	-2.178	0.029
6	Why taking warfarin, if in atrial fibrillation.	7.0	7.5	-.813	0.416
7	Why taking aspirin.	7.4	7.4	.000	1
8	Expected effects of taking a beta-blocker.	5.4	6.8	-1.807	0.071
9	Adverse effects from taking a beta blocker.	5.0	6.7	-1.997	0.046
10	Adverse effects of taking an ACE-I.	4.8	6.6	-1.997	0.046
	Low Sodium Diet	***4.9***	***6.6***	***-4.197***	***≤ .001***
11	Why maintain a 2000mg/day sodium diet.	6.0	6.9	-1.121	0.262
12	How to identify sodium in packaged foods.	4.8	6.5	-1.494	0.135
13	How to read food labels.	4.9	6.4	-1.292	0.196
14	How to decrease sodium intake at restaurants.	4.5	6.5	-1.643	0.1
15	How to decrease sodium intake when snacking.	4.5	6.5	-1.906	0.057
16	How to decrease sodium when at relatives	4.4	6.2	-1.735	0.083
17	What salt substitutes are OK to use.	4.6	6.2	-2.226	0.026
	Activity and Exercise	***4.3***	***6.3***	***-5.459***	***≤ .001***
18	Why exercise.	5.6	6.5	-1.292	0.196
19	Types of exercises/activities recommended.	4.5	6.4	-2.094	0.036
20	Types of exercises/activities to avoid.	3.8	6.3	-2.508	0.012
21	How to tell when exercising too much.	4.2	6.4	-2.684	0.007
22	What to do if you become fatigued while exercising.	5.0	6.5	-2.458	0.014
23	Sexual activity.	3.1	5.5	-2.697	0.007
	Fluid Restriction	***5.9***	***6.9***	***-3.185***	***.001***
24	Why restrict fluids.	6.4	7.2	-2.111	0.035
25	Steps to measure and monitor fluid intake.	6.3	6.9	-1.667	0.096
26	What counts as fluids.	5.0	6.5	-2.047	0.041
	Signs and Symptoms of Worsening Condition	***6.0***	***6.9***	***-2.730***	***.006***
27	Why it is important to monitor self. -	5.8	6.9	-1.930	0.054
28	What to look for.	5.8	6.7	-1.403	0.161
29	How often to monitor signs/symptoms	6.0	6.7	-1.382	0.167
30	When to notify someone of worsening condition.	6.0	6.8	-1.725	0.084
	Daily Weight Monitoring	***5.8***	***6.9***	***-2.482***	***.013***
31	Why weigh self daily.	6.2	6.9	-1.134	0.257
32	Procedure for weighing self.	5.5	6.8	-1.725	0.084
33	When to report weight to doctor/nurse.	5.5	6.5	-.962	0.336
34	What to report when speaking to doctor/nurse.	5.6	6.8	-1.802	0.072
	Signs and Symptoms of Fluid Overload	***5.8***	***6.9***	***-3.143***	***≤ .001***
35	Why it is important to monitor for fluid overload.	6.1	6.8	-.877	0.38
36	What to look for.	5.9	6.9	-1.403	0.161
37	How often to monitor for fluid overload.	5.5	6.6	-1.930	0.054
38	When to notify someone of increasing fluid levels.	5.4	6.6	-1.802	0.072
	Heart Failure Beliefs	***5.6***	***6.8***	***-4.656***	***≤ .001***
39	What causes heart failure.	5.3	6.5	-2.326	0.02
40	What does heart failure mean.	5.7	6.7	-1.611	0.107
41	Heart failure is chronic/debilitating.	5.4	6.4	-1.611	0.107
42	Heart failure may shorten life/cause premature death.	5.6	6.7	-1.511	0.131
43	Heart failure can be controlled by lifestyle actions.	5.6	7.0	-2.326	0.02
44	Regular office visits are important even when feeling fine.	5.9	7.0	-1.930	0.054

Appendix R
Overall Results of Each Survey

Table 8
Nurses' Knowledge of Heart Failure Educating Principle

Dependent Variable	Pre-Survey Mean	Post-Survey Mean	Z-Score	p-Value
Nurse's Knowledge	.73 (±.45)	.74 (±.44)	-.522	p = 0.602

Table 9
Nurses' Comfort Educating and Frequency Delivering Patient Education

Dependent Variable	Pre-Survey Mean	Post-Survey Mean	Z-Score	p-Value
Comfort in Educating Patients	4.77 (±1.90)	5.48 (±1.70)	-5.223	p ≤ .001

Dependent Variable	Pre-Survey Mean	Post-Survey Mean	Z-Score	p-Value
Frequency in Delivering Education	5.38 (± 2.62)	6.69 (±2.03)	-10.805	p ≤ .001

**Note Wilcoxon Signed Rank Test*