Heart Failure Education in A VA Outpatient Clinic

Delivered as Part of a Multidisciplinary Heart Failure Management Team

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Abstract

There is an estimated 6.2 million people Americans over the age of 20 suffering from Heart Failure (HF) (Bejamin et. al., 2019). It is essential that HF patients have sufficient knowledge about the disease and self-management (Abbasi, Ghezeljeh, & Farahani, 2018; Dinh, Bonner, Ramsbotham & Clark, 2018). Lack of self-management is largely to blame for many HF exacerbations. Current evidence supports utilizing both verbal and written education with an emphasis on self-care and education delivered in a group setting or individual setting showed equal impact on self-care and HF knowledge (Hoover, et. al., 2017; Ross et. al., 2015; Tawalbeh, 2018). An outpatient VA clinic located in a suburb of the large metropolitan identified there was no consistency on how a HF patient was educated, managed, or tracked and the registered nurses (RNs) lacked knowledge of HF. As a results of these findings this Evidence Based Project (EBP) was implemented. RNs were educated on HF and completed a self-assessment questionnaire evaluating their knowledge pre and post education. The RNs, as part of a multidisciplinary team, educated HF patients on signs and symptoms of HF as well as on how to manage the disease. Patients completed, the Kansas City Cardiomyopathy Questionnaire (KCCQ) to assess quality of life and the Self Care Heart Failure Index (SCHFI) to assess knowledge of HF and self-management skills. These questionnaires were completed initially and at 30 and 60 day intervals. The RNs self-assessment of their knowledge and ability to educate patients increased in all areas. The patient's KCCQ and SCHFI score improved at 30 days and 60 days when compared to their initial score. Larger EBPs are needed over a longer period of time to assess the impact on hospital readmissions and same day clinic visits for HF exhibitions.

Keywords: Heart Failure, self-care, education, self-management

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Heart failure (HF) affects millions adults in the United States (U.S.), despite advancements in the treatment, HF remains a significant health concern. Heart failure (HF) is a progressive disease of the heart that often results from an impaired ejection fraction (EF). This deceased pumping ability leads to HF patients experiencing symptoms such as dyspnea, fatigue, fluid retention, activity intolerance and chest pain (Moon, Yim, & Jeon, 2018). As the disease progresses patients often experience palpitations, epigastric pain and the inability to sleep lying flat due to paroxysmal dyspnea. These symptoms can significantly affect a patients ability to function and can lead to a reduced quality of life and frequent hospital admissions and readmissions. Controlling the abnormal symptoms and decreasing exacerbations depends on greatly on the patient's ability to recognize symptoms, know how to react to these abnormal symptoms, and follow provider recommendations. In patients with HF active involvement and self-management of the disease is necessary. Support and education by health care professionals is needed to improve self-management strategies for patients (Dinh, Bonner, Ramsbotham & Clark, 2018).

Background/Significance

Problem Statement

In the U.S. the lifetime risk of developing HF for adults 40 years of age and older is 20%, with 650,000 new HF cases diagnosed annually (Yancy et. al., 2013). HF is a very costly disease, the U.S. spends nearly 30.7 billion dollars each year, including cost of health care services, medications and missed days of work (Heart Failure fact sheet, 2019). According the 2013 to 2016 National Health and Nutrition Examination Survey (NHANES) there is an estimated 6.2

million people Americans over the age of 20 suffering from HF (Bejamin et. al., 2019). This number is up from 2009 to 2012, at that time it was estimated there were 5.7 adults in the United States (US) suffering from HF. Moreover the incidence of HF is expected to increase by 46% from 2012 to 2030 resulting in >8 million adults 18 years and older experiencing HF. As the population of the US is aging and the overall life expectancy is increasing the lifetime risk of developing HF is high. It is estimated the lifetime risk for those 45 years to 95 years is at 20%-45%. According to CDC.gov, HF deaths are 168 per 100,000 nationally. Locally, the state of Arizona does slightly better than the national average with 122 per 100,000, and for Maricopa County the rate is 110 per 100,000. Hospitalizations for Medicare beneficiaries admitted for HF nationally is 34 per 1,000, for Arizona it is 22.6 per 1,000, and for Maricopa County it is 22 per 1,000.

Every ten years as part of national benchmarks and goals are developed aimed at improving the health of all Americans. These objectives are science-based and encourage collaboration across communities to empower individuals to make healthier lifestyle choices. A goal of Healthy people 2020 was to decrease the incidence of hospitalizations for people suffering from HF, these goals are revisited over the 10 year period and adjusted. The goal of reducing heart failure hospitalizations is proposed to continue for Healthy People 2030 (Secretary's Advisory Committee, n.d.). The CDC has provided funding to 22 state health departments and five large city/county health departments to develop new and innovative approaches utilizing evidence based strategies to prevent and manage heart disease. One such area the CDC proposes recipients look at is implementing services that improve self-management and lifestyle changes for those patients with hypertension, hyperlipidemia, and/or who have had a cardiac event (State, Local and Tribal Programs, 2020).

HF is the most common cause for readmissions of Medicare patients. In 2010 The Affordable Care Act (ACC) created the Hospital Readmissions Reduction Program (HRRP), requiring Centers for Medicare and Medicaid Services (CMS) to penalized hospitals with high readmission rates (Chamberlain, Sond, Mahendraraj, Lau, & Siracuse, 2018). The 30-day readmission rate for HF patients decreased from 25.1% in 2009 to 23.5% in 2013. This reduction in admissions created a cost savings of about $200 million.

Purpose and Rational

HF is a progressive disease of the heart that often results from an impaired ejection fraction (EF). This deceased pumping ability leads to HF patients experiencing symptoms such as dyspnea, fatigue, fluid retention, activity intolerance and chest pain (Moon, Yim, & Jeon, 2018). As the disease progresses patients often experience palpitations, epigastric pain and the inability to sleep lying flat due to paroxysmal dyspnea. These symptoms can significantly affect a patients ability to function and can lead to a reduced quality of life and frequent hospital admissions and readmissions. HF is a complex disease process and it is essential for HF patients to have sufficient knowledge about the disease and self-management (Abbasi, Ghezeljeh, & Farahani, 2018; Dinh, Bonner, Ramsbotham & Clark, 2018). Patients with HF have a greatly reduced health related quality of life (HRQL), frequent hospital admissions, and early mortality resulting in poor health outcomes and increased costs (Abbasi, Ghezeljeh, & Farahani, 2018; Dickson et al., 2015; Hagglunded et. al., 2015; Musekamp et. al., 2017). Ineffective HF self-management including failure to recognize symptoms and delayed reporting of symptoms accounts for 70% of HF hospitalizations (Reeder, Ercole, Peek, & Smith, 2015).

Controlling the abnormal symptoms and decreasing exacerbations depends on greatly on the patient's ability to recognize symptoms, know how to react to these abnormal symptoms, and

follow provider recommendations. These self-management strategies include; (a) taking medications, (b) eating a low sodium diet, (c) daily exercise, (d) weight loss, (e) tracking of symptoms, weight and blood pressure (BP) readings daily (Yancy et. al., 2013; Heart Failure fact sheet, 2019). Therefor it is important to improve on patient's knowledge of HF and self-management ability.

The purpose of this paper is to review and describe effective strategies and interventions in self-management of HF patients and report on an evidenced based HF educational program utilized with HF patients in an out-patient Veterans Administration (VA) primary care clinic in large metropolitan area of Arizona.

Internal Evidence

A VA Health Care System in a large metropolitan area was reporting significant admission and readmission rates for the HF patients. The most recent data shows HF admission of 122.4 patients per 1000 were admitted to this VA Medical Center. This is not reflective of all patients within this VA system, as not all patients go to the VA Medical Center for treatment. Many VA patients have private insurance in addition to VA coverage and opt to go a non-VA hospital. This would make one think that the actual admission rate is higher. The only way a provider is aware of the admission is if they are notified by the hospital or if the patient schedules a post hospitalization follow up appointment. According to Medicare.gov, the VA medical center is worse than the national average for rate of readmissions for HF patients. There was not a specific percentage for the VA listed on Medicare.gov.

This VA Health Care System also includes many primary care clinics. At one of these outpatient primary care VA clinics a pilot program working was HF patients was being developed. It was identified that there was no consistency on how a HF patient was educated,

managed, or tracked within this outpatient VA clinic located in a suburb of the large metropolitan area previously mentioned. The nurse manager at this clinic stated that some of the RNs did not have a full understanding HF and how to educate HF patients. They did not fully understand the problems or issues this population of patients face and there was no standardized or consistent education provided to the heart failure patients.

The population for this EBP project is specific to the VA population. However there are a limited number of studies done on VA patients with HF. The findings of other studies conducted on the adult HF population will be generalized to the VA patient.

PICOT Question

This inquiry has led to the clinically relevant PICOT question "In US Veterans with heart failure (P) how does structured evidenced based heart failure education (I) as compared to usual care (C) affect the patient's knowledge of heart failure, knowledge of self-management and quality of life (O) over two months (T)."

Evidence Synthesis

Search Strategy

An exhaustive literature search was used to address the PICOT question. Databases searched for this literature review include PubMed, CINAHL, and PschInfo. The databases were searched using a combination of the following key terms: *heart failure, education, compliance, self management, and knowledge.* Filters applied to the search included publications from the last five years (01/2014-02/2019), English language, and peer-reviewed articles.

The initial search of PubMed was completed using the key terms *heart failure, education, self-management, knowledge* and *handouts.* This search was too narrowing and yielded zero results. The term *handouts* was removed and a search utilizing the remaining key terms *heart*

failure, education, self management, and *knowledge*. This search yielded a result of 84 publications. An additional search was conducted using the key terms *heart failure, education* and *compliance,* which yielded 152 studies.

The CINHAL database was initially searched using the key terms *heart failure, education* and *self management.* The search yielded a result of 81 publications. An additional search was conducted using the following key terms *heart failure, education* and *compliance.* This search yielded 93 articles.

The database PyschINFO was initially searched using the following key terms *heart failure* and *self management,* which yielded 377 articles. The search was further refined by adding in the key term *education.* With this additional key term, there were 53 articles that resulted from the search. This search was further refined with the addition of a dash between the words *self* and *management,* and resulted in 27 articles. Additionally, the key terms *heart failure, compliance* and *education* was searched. There were only 20 articles that resulted from this search.

After reviewing the articles, titles, and abstracts from these databases searches there were 107 articles identified as relevant studies. This was further refined to include only studies that involved an educational intervention and/or impact on self-management. In addition, preference was given to high levels of evidence such as randomized control trials (RCTs). With this redefined criteria there were 18 studies identified. Ten final articles were chosen for the purpose of this review, including randomized control trials and Quasi-experimental studies (Appendix A).

Critical Appraisal and Synthesis

The 10 studies included in this literature review were evaluated utilizing Melnyke and Fineout-Overholt's (2015) rapid critical appraisal. The 10 articles chosen where published within the last five years as to ensure the most recent and relevant data. The studies ranged from level II to level III evidence. Six of the 10 studies were level II evidence. These studies were randomized control trials (RCT), one of those six was quasi-experimental (QE) RCT. The other four studies were level III evidence and were comprised of QE utilizing various types of non-randomized methods (Appendix B). Three of the 10 studies received funding however, the funding for the three studies did not appear to come from a source that affected the validity of the study. No bias was recognized for any of the 10 studies (Appendix A).

The mean age for participants in the studies ranges from age 55-77 years old and the percentage of males range from 48-68%. The sample size for eight of the studies ranged from 38-127, there were two outliers out of the 10 studies with a sample size of 16 and 371 (Appendix B). There was a broad ethnic representation across the studies and the studies were conducted in a variety of countries (Appendix A). Six of the 10 studies were conducted in an out-patient setting, the other four were conducted in a hospital setting. All but one of the studies utilized either group or individualized verbal education class. The one study that did not utilize verbal education used a tablet installed in the patient's home to deliver the education. Five of the nine studies which used verbal education also gave the patients written materials (Appendix B).

Self-care heart failure index (SCHFI) was used as one of the measurement tools in five of the studies. Two studies used the European Heart Failure Self-care Behavior 9-item (EHFScB9). The most common dependent variable measured was self-care behaviors of the participants, this

was evaluated by seven out of the 10 studies. Quality of life, HF knowledge and readmissions were each evaluated in three of the studies (Appendix B).

Conclusion from Evidence

Heart failure remains a significant health concern worldwide. Heart failure exacerbations affect both the patient's physical health as well as their quality of life. In the United States there is a significant impact on the nation financially and is a burden on the health care system as a whole. This literature review revealed the range on interventions being used to address HF. While there are numerous interventions explored in the literature, this review demonstrated that current evidence supports utilizing both verbal and written education with an emphasis on self-care. Education delivered in a group setting or individual setting showed equal impact on self-care and HF knowledge (Appendix B).

Theoretical Framework

The Situation-Specific Theory of Heart Failure Self-Care was chosen to guide this Evidence Based Project (EBP) project. The original self-care theory was developed in 2008 and was revised and updated by Riegel and colleagues in 2016. The revised model has three self-care processes: (a) self-care maintenance, (b) symptom perception, and (c) self-care management (Appendix C). This theoretical framework is specific to the HF population and addresses many of the needs when caring for this population. Symptom perception was added to this revised model as the previous model only included symptom recognition, which was theorized to initiate self-care management. This was not effective because patients who do not recognize their symptoms cannot respond to them. In this new model, symptom perception includes both symptom monitoring and recognition.

This theoretical framework provides a logical way to help patients understand and navigate the complex diagnosis of HF and can be applied to this evidence-based project. Evidence has demonstrated the need to improve self-care in HF patients, with the most effective method being education. It was demonstrated that the HF self-care theoretical framework utilizing maintenance, symptom perception, and management are essential to self-care. The Situation-Specific Theory of Heart Failure Self-Care will be incorporated into an outpatient primary care clinic to improve education delivery and increase self-care.

Implementation Framework

The Health Outcomes Institute's Outcomes Management (OM) Model can be used in interdisciplinary settings as guide to define outcomes, measurement methods, define evidence based practices, educate and train healthcare providers on the new practice and measure the impact associated with the new intervention (Melnyk & Fineout-Overholt, 2015). The OM model is divided in to four distinct phases (Appendix D). Phase one identifies the clinical problem, outcomes, and instruments and data sources. Phase two consists of a critical appraisal of the evidence, synthesis and analysis of findings, identifying key stakeholders, and developing methods to support the new standardization. Phase three involves education of the clinicians, finalize process and outcomes measurements, implementing new practice change and begin data collection. Finally phase four comprises data collection, statistical analysis, dissemination of findings, and identifying opportunities for additional improvements.

For this EBP project the following occurred at each phase of the OM model. In phase one the clinical problem were identified after meeting with key stakeholders at the Phoenix VA Medical Center. At the initial meeting HF was identified as a strategic initiative for this VA Healthcare System and a connection was made with the Nurse Manager, a key stakeholder at the

VA primary care clinic. For Phase two an extensive literature review was conducted to identify promising interventions. Education was identified as a gap in patient care at the VA clinic. There was no standardized HF education being utilized by the healthcare providers. In phase three the RNs at the VA clinic were educated on the HF and use of an evidenced based HF educational tool. At this phase baseline data was collected to evaluate the effectiveness of the education provided. RNs will be educating HF patients and the HF patients will be given questionnaires prior to receiving the HF education, 30 days and 60 days after receiving the HF education. Phase four is the final phase during this phase pre and post data collection was closed. Statistical analysis of the data was conducted to assess the effectiveness of the new practice change. In addition there was dissemination of results to key stakeholders.

Project Methods

Arizona State University Institutional Review Board (IRB) approval and non-research designation form the VA were obtained prior to implementation of the project (Appendix E). The project was conducted at a VA outpatient clinic in Arizona as part of newly formed pilot program consisting of a multidisciplinary heart failure management team. The nurse manager, medical director, and RNs were the key stakeholders involved in this EBP project. The nurse manager and medical director were essential in facilitating the engagement of the RNs. The newly formed HF management team is a pilot program addressing the needs of stage 1 and stage 2 HF patients. The team consists of a MD, RN, a pharmacist, dietician, and a social work.

Education and training for the RNs occurred at a monthly staff meeting and an additional education day was arranged for those who were not able to attend the staff meeting. The RNs were educated on HF via a power point presentation, use of the Krames Patient Education: Understanding Heart Failure educational booklet, the Green Light to Go form and daily symptom

and weight tracking chart (Appendix F). After receiving the education the RNs signed a consent and completed an optional self-assessment questionnaire evaluating their knowledge prior to and after receiving the training (Appendix G).

A rolling enrolment was used, the patients were enrolled over a period of two months. Completion of the final 60 day follow up survey of the final patients enrolled was to occur approximately four months after initiation of patient education. The patients met with the RN and were given the consent, demographics questionnaire, the two pre-surveys, the Self-Care of Heart Failure Index v7.2 (SCHFI v7.2) and the Kansas City Cardiomyopathy Questionnaire (KCCQ-12) (Appendix H). The patient then was given an educational packet including the Krames HF booklet, the Green Light to Go form and the daily symptom and weight tracking chart. The patients were educated by the RN utilizing these materials. Next the patient met with each of the four disciplines. A follow up phone call from the RN occurred approximately at one month and two months later. The 30 and 60 day follow up questionnaires were completed as part of this phone call.

Two assessments were used to evaluate the outcomes. One was a self-evaluation by the RNs assessing their skills, attitudes, and comfort prior to the education and training and after receiving the education and training. As previously mentioned two different tools were utilized with patients, the SCHFI v.7.2 and the KCCQ. Self-care is defined as a decision-making process involving the choice of behaviors to maintain physical stability and the response to symptoms when they occur (Riegel et al., 2009). The SCHFI v.7.2 measures self-care and is divided into three sections, maintenance, management and confidence. Reigel and colleagues suggest scoring each individually rather than as a total score. The KCCQ-12 was developed from the 23-item Kansas City Cardiomyopathy Questionnaire (KCCQ) to be more feasible to implement (Spertus

& Jones, 2015). It is used to evaluate HF disease impact on symptoms, function and quality of life. The KCCQ-12 evaluates four areas; (a) physical limitation, (b) symptom frequency, (c) quality of life, and (d) social limitation.

Data was collected as the project was implemented and was transcribed on to an excel spreadsheet. At completion of the project the data was analyzed using Intellectus statistical analysis software. No funding was received for this project. The budget for the project was estimated to be at $4,476 (Appendix I). This included expenses for preparation, including hourly expenses to design some of the tools and printing costs. Delivery expenses included education of the RNs. Finally there will be costs during the evaluation phase to review and analyze data. In addition to these direct costs, there are indirect cost including facilities, administrative costs, and office supplies.

Results

Descriptive statistics was used when analyzing the data for both the RN self-assessment and the patient's questionnaires. There were approximately 15 RNs who attended the educational session on HF and a total of nine RNs who answered the self-assessment questionnaire. The average response increased for all questions when comparing the pre and post education responses (Appendix J). The pre and post data was further analyzed using summary statistics (Appendix J). Standard deviation (SD) measures the spread of data around the mean of a scale variable (Intellectus, 2020). The SDs for the pre scores on average were greater than 1 and for the post scores the SD was 0.53 for three of the questions and 0.87 for one questions which indicates that there was a greater range of the scores for the pre questions when compared to the post questions. The increase in scores indicates that the RNs self assessed to have increased understanding of HF and an increased ability to educate HF patients.

A total of 11 patients were enrolled, four patients completed the 30 days follow up questionnaires and two completed the 60 day follow up questionnaire. All the patients enrolled were male, age range was 45 years to 88 years, seven Caucasian, three African American, and one Hispanic. Overall the KCCQ score increased at 30 days but dropped slightly when comparing the 30 day to the 60 day score (Appendix K). However the 60 day score still remained higher than the initial score, a higher score is indicative of an improved rating. The SCHFI also showed improvement when comparing the initial to the 30 and 60 day score (Appendix K). An increase in score is the desired outcome. The increase in the KCCQ score indicates that patients had an improved quality of life and the increase in the SCHFI score indicates that patients had improved understanding of HF and improved ability to self-manage the disease. Both the RN manager and the medical director were very pleased with the results and supported continuing the utilization of the tools and ensuring all RNs treating HF patients were educated on the disease and how to educate patients. However the pilot HF clinic was being terminated. In addition the RN manager, who was the champion for the project, has since retired. Not having this champion and not having the HF clinic makes it difficult to sustain the education of the RNs on HF and track patient data.

Discussion

The results of this DNP project demonstrated the impact that education can have on a HF patients understanding of the disease. The results of this DNP project are consistent with findings of studies on HF education. Tawalbeh (2018) study on cardiac education with HF patients admitted to a hospital in Jordan demonstrated the impact that HF education had on the patients knowledge and improvement in self-care behaviors. One of the goals of self-management of a disease is to increase a patients skills and ability to manage a disease (Korzh & Krasnokutskiy,

2016). The authors conducted their study with HF patients in a primary care clinic and found that education plays a significant role in improving a patients health literacy and ability to self-manage HF. As noted by Gonzaga (2018) HF education improved patients quality of life and improved self-care management and confidence among HF patients. Furthermore Dinh and colleagues (2019) demonstrated that education delivered by a nurse including individual education using a HF booklet and teach back method showed marked improvement in knowledge and self-care.

Despite being a small project this EBP project showed positive results and could be used as foundation for a larger project involving more patients over a longer period of time. Additional data could be tracked including the impact on hospitalizations and re-hospitalizations, the need for same day appointments for HF exacerbations, medication compliance, and rate of progression of the disease to worsening HF stages. There were several limitations encountered when conducting this project. One major limitation was the restrictions on who was enrolled in the pilot HF clinic, this limited the number patients involved in this EBP project. Another limitation was the pilot HF clinic ended sooner than expected, this limited the number of 60 day follow up responses that were able to be obtained. The ending of the pilot HF clinic also impacts the likelihood of a more robust project occurring.

Conclusion

The literature review indicated that utilization of a both written and verbal education with HF patients improved their ability to self-manage the disease and improved their quality of life score. Helping HF patients better manage their disease benefits both the patients and the healthcare system as a whole. Educating RNs on HF including the disease process and what information is essential to educate HF patients, had a positive impact on the RNs knowledge of

HF and on their ability to educate HF patients. Resulting in the HF patients having an improved quality of life and HF self-management ability. This further validates the positive impact that education has on the HF patient. The heart is the lifeline to our body and knowledge gives us the power to live heart healthy lives.

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Appendix A

Table 1

Evaluation Table

Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Abbasi, A., Ghezeljeh, T. N., & Farahani, M. A. (2018). Effect of the self-management education program on the quality of life in people with chronic heart failure: a randomized controlled trial. **Country:** Iran	Theory/conceptual framework was not explicitly stated, it can be inferred that the Self-care deficit theory could have guided the researchers.	**Design:** RCT **Purpose:** To determine the effect of SM EDU program on QOL in people with HF.	N = 60 F 31 (29) CG: n = 30 F 11 (19) IG: n = 30 F 20 (10) **Setting:** A teaching hospital in an urban area of Iran **Demographics:** CG: Marital status; Married = 25 Single = 5	**IV:** Three sessions of SM EDU with FU phone call monthly for three months **DV:** Iranian heart failure QOL questionnaire: severity of symptoms, physical limitations, social interference, psychological condition, self-	Iranian heart failure QOL questionnaire	Kolmogorov -Smirnov test Independent -samples *t*-test Paired-samples *t*-test Chi-square & Fisher exact SPSS software	$p<0.05$ was statistically significant QOL: $p<0.001$ Symptoms: $p=0.002$ Effect size 0.5 Physical limitations: $p=0.145$ Effect size .37	**LOE:** II **Strengths:** low risk, non-invasive intervention **Weaknesses:** Small n; did not look at depression and social support **Conclusion:** SM EDU with FU in people with HF improves QOL

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Funding: The authors received financial support from Iran University Registry of Clinicl Trials for the research, authorship, and/or publication of the article. **Bias:** None recognized			HF class; Class I = 17 Class II = 13 Mean EF 30.92±8.96 IG: Marital status; Married = 20 Single = 10 HF class; Class I = 16 Class II = 14 Mean EF 28.77±6.85 **Inclusion:** previously diagnosed CHF; stabilized in terms of the acute condition of the disease; no sensory-cognitive problems; literate and able to speak in Farsi. **Exclusion:** not attending the EDU session **Attrition:** 0	efficacy and knowledge, and life satisfaction			Social inference: p=0.01 Effect size 1.1 Psychological condition: p=0.013 Effect size .94 Self-efficacy and knowledge: p<0.001 Effect size 1.2 Life satisfaction: p=0.12 Effect size .53	**Feasibility:** Recommended for use in health care systems to improve QOL and ensure adherence to treatment in people with HF.

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Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
DelaCruz, F., Quinn, Patricia, & Renold, Lowell. (2015). The impact of a one-on-one coaching session on heart failure patients' knowledge of self-care disease management **Country:** United States **Funding:** None recognized **Bias:** None recognized	Middle Range Theory of SC of Chronic Illness	**Design:** Quasi experimental RCT **Purpose:** To evaluate the impact of a one-on-one coaching session on HF patients' knowledge of SC disease management as compared to those who received the usual care, which is a discharge instruction from the doctor.	N= 39 F 14 (25) CG: n= 21 F 8 (13) IG: n= 18 F 6 (12) **Setting:** A cardiology clinic **Demographics:** Majority of the patient population is of Asian Pacific Islander and Hispanic ethnicity Mean age of CG: 60 Mean Age IG: 62.4 **Inclusion:** selected based on the following criteria: (a) male and female	**IV:** The educational tool Caring for your Heart: Living Well with Heart Failure. **DV:** SCHFI English version 6.2 **DV1:** maintenance score **DV2:** management scale scores **DV3:** confidence scores	SCHFI English version 6.2	Descriptive statistics including means and standard deviation. Independent *t*-test was used to compare the means for quantitative variables and Chi-square test for homogeneity between groups	**DV1:** CG scores increased by 11% as IG increased by 15% **DV2:** CG scores increased by 10% IG increased by 50% **DV3:** CG scores increased by 0.41% IG scores increased by 11.88%	**LOE:** III **Strengths:** **Weaknesses:** Limited availability due to age criteria and English fluency. One ethnicity A type II error was identified, this could be minimized with a larger sample size. **Conclusions:** One-on-one couching affects Pts knowledge of SC maintenance, symptom management and improve

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			patients (from 45 to 75 years old); (b) ability to speak, write, and understand conversational English; (c) with documented diagnosis of HF; (d) NYHA class I-III symptoms, and (e) having an identified primary care provider or cardiologist for follow-up appointments. **Exclusions:** Exclusion criteria included (a) documented HF NYHA class IV, (b) living in a skilled nursing or board and care facility; and (c) other co-morbidities that have a terminal impact on the patient's health status such as					self-confidence in making healthcare decisions. **Feasibility:** The couching was proven to be effective and could be utilized in a primary care or cardiology office setting.

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			end-stage chronic kidney disease, advanced cancer, and cardiomyopathy					
Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Dickson, V., Melkus, G., Katz, S., Levine-Wong, A., Dillworth, J., Cleland, C., & Riegel, B. (2014). Building skill in heart failure self-care among community dwelling older adults: Results of a pilot study **Country:** United States	Situation-specific theory of HF self care	**Design:** RCT **Purpose:** To test the efficacy of a community-based skill-building intervention on HF SC, knowledge and health-related quality of life (HRQL) at 1- and 3-months	N = 75 CG: n = 37; F 18 (19) IG: n = 38; F 22 (16) **Setting:** community senior centers **Demographic:** CG Black: 11 Hispanic: 12 White: 8 Other: 6 IG: Black: 9 Hispanic: 12 White: 12 Other: 5	**IV:** group education focused on four major areas of the SC process: (1) medication adherence, (2) low-salt diet, (3) symptom monitoring, and (4) symptom management **DV1:** SC maintenance **DV2:** SCM	**DV1:** SCHFI v6.2 **DV2:** SCHFI **DV2:** DHFKS **DV3:** HRQL	Chi-square and independent samples *t*-tests a mixed model (between and within subject) analysis of variance (ANOVA) was conducted Cohen's f was calculated as	**DV1:** IG vs CG F(2, 47) = 3.42, p = .041 *Cohens f* = .38 Intervention Improved **DV2:** F(2, 41) = 4.10, p = .024 (partial eta squared = .17) *Chens f*= .38	**LOE:** II **Strengths:** use of a health educator, community based, low risk, non-invasive intervention, ethnic diversity **Weaknesses:** small sample size, may not reflect the ethnic minority and low socio economic status population at

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Funding: funded by the American Heart Association Clinical Research Program Grant **Bias:** none recognized			CG: Married: 7 Widowed: 7 Divorced: 14 IG: Married: 7 Widowed: 8 Divorced: 21 **Inclusion:** diagnosis of chronic HF for at least 3 months, were able to read and speak either English or Spanish, over age 55, living in a setting where they could engage in self care **Exclusion:** Cognitive impairment, **Attrition:** IG=5 and the CG= 8 was inability to contact individuals for follow up	**DV3**: Knowledge **DV4**: Quality of life		a standardized index of effect sizes Analyses were conducted using IBM SPSS v. 21.0	**DV3:** There was a significant interaction effect, F(2, 53) = 8.00, p = .001 (partial eta squared = .23) *Cohens f*= .54 **DV4:** There was no significant difference in HRQL between the IG and the CG , F(1, 36) = 4.11, p = .05 and the overall summary score F(1, 36) = 4.66, p = .04 No significant effect	large, lack of a cost-effectiveness analysis **Conclusion:** The intervention improved SC management, maintenance and knowledge of HF. **Feasibility:** implications for the growing population of community-dwelling adults with HF because it leverages community resources. Utilization of trained health educators can be carry out in many settings

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Gonzaga, M. (2018). Enhanced patient-centered educational program for HF self-care management in sub-acute settings. **Country:** United States **Funding:** Non recognized **Bias:** Non recognized	Expanded Chronic Care Model	**Design:** RCT **Purpose:** To evaluate the effectiveness of a patient centered educational program on SCM among HF in a sub-acute setting.	N= 16 IG: n= 5 F (9) **Setting:** two sub-acute units **Demographic:** Researcher did not mention the demographics **Inclusion:** Primary or secondary diagnosis with HF who were admitted to one of the two units. English speaking with a plan to discharge back to their community. **Exclusions:** Pts with active	**IV:** Patients and or caregivers were educated for 15 to 30 minutes on knowledge deficits identified by the SCHFI tool. **DV1:** SCM score **DV2:** SC Maintenance **DV3:** Self Confidence	SCHFI: SCM, SC maintenance & self confidence	Descriptive statistics utilizing SPSS and Wilcoxon matched-paired signed rank	**DV1:** SCM mean score improved from pre 2.12 to post 2.7 R = 0.700, p = < .001 **DV2:** SC maintenance showed statistically significant improvement between pre and post scores r = 0.456, p = < .001 **DV3:** Self-confidence mean score improved from pre 2.46 to post 2.72 r =	**LOE:** II **Strengths:** low risk, non-invasive intervention **Weaknesses:** small sample size, researcher did not report deport demographics **Conclusions:** The results of the study demonstrated improvement in all three categories evaluated. **Feasibility:** This study has implications on educational

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			psychiatric conditions or illnesses and vulnerable populations. **Attrition:** 6 3 were readmitted to hospital 3 were DC to long term care.				0.823, p = < .001	interventions aimed at improving SCM in HF patients. It had a small sample size but can utilized as a guide future studies.
Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Hägglund, E., Lyngå, P., Frie, F., Ullman, B., Persson, H., Melin, M., & Hagerman, I. (2015). Patient-centered home-based management of heart failure. Findings from a randomized clinical trial evaluating a tablet computer	Theory/concept ual framework was not explicitly stated, it can be inferred that the situation-specific theory of HF self-care could have guided the researchers.	**Design:** prospective, RCT **Purpose:** To evaluate if a home intervention system utilizing a tablet computer connected to the Pts scale had an effect	N= 72 CG: n= 40; F 12 (28) IG: n= 32; F 11 (21) **Setting:** Three University hospitals in Stockholm, Sweden. **Demographic:** CG: Age 76 ± 7 IG:	**IV:** Tablet computer was installed in the IG home. 1) actual day weight, drug dose and a short informative tip on how to improve living with HF; 2) an overview of information about the HF disease and	Self-care was measured with EHFScB-9 KCCQ and Swedish version of the Health Survey was used to measure HRQL Adherence was defined as ‘ the number of days that the patient had interacted with the system,	Student ’ s *t*-test for independent samples if normally distributed or if not Mann – Whitney test A $p < 0.05$ were considered statistically significant	**DV 1:** Self-Care improved with a $p < 0.05$ **DV2:** HRQL improved with a $p < 0.05$ **DV3:** Adherence was a median of 88% **DV4:** the	**LOE:** II **Strengths:** low risk, non-invasive intervention **Weaknesses:** Ten Pts that were in the intervention group withdrew. There were statistically significant high

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for self-care, quality of life and effects on knowledge **Country:** Sweden **Funding:** Swedish National Quality registry of HF **Bias:** Non recognized		on SC behavior.	Age 75 + 8 **Inclusion:** hospitalized and diagnosed for HF with reduced ejection fraction (HFrEF) and/or HF with preserved EF (HFpEF) according to guidelines with New York Heart Association (NYHA) class II – IV, measured at randomization, prior to enrolment **Exclusions:** were other serious conditions with a life expectancy of less than 6 months, diagnosed dementia or cognitive	lifestyle advice; 3) graphical representation of variations in weight, medication and well-being over time; and 4) contact details to responsible nurses and doctors at the HF center and to persons responsible for technical support. **DV1:** Self-Care **DV2:** HRQL **DV3:** Adherence **DV4:** Disease-specific knowledge **DV5:** HF hospitalization	divided by the number of days equipped with the system DHFKS was used to measure knowledge of HF and the regimen		knowledge in both groups increased and improved with (11%) and (8%) for the IG and CG, respectively (p 0.05) **DV5:** A total of 7 patients were hospitalized in the IG (22%) and 11 in the CG (28%).	number of Afib Pts in the IG. The use of the DHFKS seemed to of limited the results due to the high scores at baseline. **Conclusions:** Utilization of a tablet computer with home intervention system improved self-care and HRQL and reduced hospital days **Feasibility:** This study demonstrated that the utilization of a tablet computer is a valuable tool for improving Pts with HF outcomes and for improving self-care.

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			impairment of such severity as it would make the patient unable to understand instructions provided **Attrition:** 10					
Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Hoover, C., Plamann, J., & Beckel, J. (2017). Outcomes of an Interdisciplinary Transitional Care Quality Improvement Project on Self-Management and Health Care Use in Patients With Heart Failure. **Country:** United States	Donabedian's quality assessment model and the Medical Outcomes Study Framework, self-care theory	**Design:** quasi-experimental comparative descriptive study **Purpose:** To compare SM, RAR, and cost in patients who received a transitional care program compared to those who	N = 66; F 51 (32) CG: n = 36; F 17 (19) IG: n = 30; F 15 (15) **Setting:** Midwestern acute care hospital **Demographic:** mean age 77.48, mean CC 3.63	**IV1:** implementation of an evidence-based HF order set on admission to the hospital **IV2:** pharmacist medication reconciliation **IV3:** one-on-one pharmacist teaching, **IV4:** a provider visit scheduled within 10 days	SCHFI	SPSS version 18.0. Independent *t*-tests Pearson chi-square tests Gain scores were computed and compared between and within groups.	**DV1, DV2, & DV3:** Used SCHFI IG scores for maintenance (mean = 0.37, SD = 0.48, t[28] = 4.12, p = 0.008), management (mean = 0.46, SD = 0.7, t[28] = 3.55, p = 0.001), and	**LOE:** III **Strengths:** multidisciplinary approach, low risk, non-invasive intervention **Weaknesses:** convenience sample, moderate sample size, and loss to FU. **Conclusion:** There were few

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Funding: None recognized **Bias:** none recognized		received the routine hospital DC plan	90% white non-Hispanic 62% NYHA class 3b-4 IG: mean age 75.36, mean CC 3.93 **Inclusion:** Admitting diagnosis of HF to one of the medical units, age 21 and older, ability to read and understand English, and lived within a 30-mile radius of the admitting hospital. **Exclusion:** new diagnosis of HF, younger than 21 years old, significant cognitive impairment. **Attrition:** Total of five participants two	of discharge **IV5:** HF education, and a visit from a RN TC prior to discharge. **IV6:** A home visit from the RN TC within 72 hours of DC **IV7:** three FU phones calls over three months. **DV1:** medication awareness and SM **DV2:** developing a personal health record **DV3:** scheduling and maintaining appointments with specialists and primary care providers **DV4:** early recognition of signs and symptoms of			confidence (mean = 0.57, SD = 0.8, t[28] = 3.89, p = 0.001) conditions. CG maintenance (mean = 0.26, SD = 0.62, t[30] = 2.38, p = 0.02) and confidence (mean = 0.4, SD = 0.7, t[30] = 3.24, p = 0.03) conditions **DV4**: IG vs CG (mean = –0.11, SD = 1.71 versus mean = 1.08, SD = 1.91; t[40] = 2.096, p = 0.04	all cause readmissions to the hospital 30 days after discharge for patients who received Coleman Care Transitions Intervention. Costs savings dues to decreased readmission rates. Improved SM in the IG. **Feasibility:** With the increasing numbers of older adults living at home there is a need for collaboration between pharmacists, physicians, nurse specialists, home care nurses, and patients.

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			from the CG and three from the IG were lost to follow up	HF exacerbation **DV5:** all cause readmission rates			**DV5: C**G vs IG ($\chi 2$ [1] = 11.77, $p < 0.001$); 16 of 66 (24%) versus 4 of 66 (6%)	
Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Korzh, O. & Krasnokutskiy, S. (2016). Significance of education and self-management support for patients with chronic heart failure in family physician practice. **Country:** Ukraine	Theory/concept ual framework was not explicitly stated, it can be inferred that the situation-specific theory of HF self-care could have guided the researchers.	**Design:** RCT, Cross-sectional survey **Purpose:** To ascertain the sources and content of education for patients with CHF and evaluate the use of patient education for self-management	N= 371 CG: n= 198 IG: n= 173 **Setting:** Primary care in the Ukraine **Demographic:** CG: average age 64 ± 8,4 IG: average age 63 ± 8,1 **Inclusion:** Pts diagnosed with New York Heart Association	**IV:** HF education utilizing a 12-hour program entitled "Self-management in CHF." **DV1:** Dairy of self control **DV2:** Monitoring of BP is not less than 1 time in 2 days **DV3:** Monitoring of HR is not less	SECC-scale assessment (the scale of evaluation of clinical condition in CHF) A questionnaire was developed asking a series of questions including basic demographic data, a series of questions regarding the education received, who	Microsoft Office Excel spreadsheet analyzed using an SPSS statistical package. The Kruskal–Wallis test was used to examine the difference in knowledge scores. The chi-square	**DV1:** IG Initial 17% 6 mo 88% CG: Initial 22% 6 mo 19% **DV2:** IG Initial 22% 6 mo 87% CG: Initial 25% 6 mo 26%	**LOE:** II **Strengths:** low risk, non-invasive intervention **Weaknesses:** **Conclusions:** Results suggest that the content of self-management support for patients with CHF needs to focus on

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Funding: None recognized **Bias:** None recognized		support of patients with CHF in primary care.	class II or III CHF, agreed to education and follow-up care and would be available by phone. **Exclusions:** Patients who experienced significant worsening of their disease and were transferred to the intensive care unit, were hospitalized for greater than 1 month, had a chronic disease other than CHF or were diagnosed with a mental illness.	than 1 time in 2 days **DV4:** Measurement of BM is 2 times per week **DV5:** Compliance with the recommendations of balanced diet **DV6:** Compliance with the recommendations of daily walks and exercises	provided it and self-perceived knowledge. Assessment of SM needs was assessed with 10 standardized open-ended questions.	test was used to test the differences in the method of CHF diagnosis, education and support.	**DV3:** IG Initial 22% 6 mo 81% CG: Initial 25% 6 mo 34% **DV4:** IG Initial 6% 6 mo 60% CG: Initial 5% 6 mo 5% **DV5:** IG Initial 13% 6 mo 50% CG: Initial 12% 6 mo 19% **DV6:** IG Initial 10% 6 mo 61% CG Initial 10%	addressing patients' needs for improved health literacy, fears associated with uncertainty, disease progression and suffering; and expectations about overcoming or replacing losses and desire for improved care. Findings show the significant role of self-management and patient education in the treatment of CHF **Feasibility:** Recommended for use in primary care practices

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							6 mo 20%	
Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Moon, M. K., Yim, J., & Jeon, M. Y. (2018). The effect of a telephone-based self-management program led by nurses on self-care behavior, biological index for cardiac cunction, and depression in ambulatory heart failure patients. **Country:** Korea **Funding:** None recognized	Theory/conceptual framework was not explicitly stated, it can be inferred that the situation-specific theory of HF self-care could have guided the researchers.	**Design:** quasi-experiment in nonequivalent control group design **Purpose:** To examine the effects of a telephone-based self-management support program led by nurses on self-care behavior, biological index for cardiac function, and depression	N= 38 CG: n= 8 F (12) IG: n= 7 F (11) **Setting:** outpatient department of the Cardiology Internal Medicine division of Gyeongsang National University Hospital located in Jinju city **Demographic:** **CG:** Age 60-64: 5 Age 65-69: 4 Age 70-75: 11 **IG:** Age 60-64: 8	**IV:** Telephone self-management program **DV1:** SCB **DV2 & 3:** Cardiac functional index **DV3:** Depression	**DV1:** EHFScB9 **DV2:** NT-proBNP levels **DV3:** LV EF **DV4:** CES-D	Chi-square test, Fisher's exact test, independent -test, paired t test, and repeated measures analysis of variance using the SPSS/WIN 21.0	**DV1:** EHFScB9 t = 8.22, p <.001 **DV2:** NT-proBNP levels t = -2.28, p <.022 **DV3:** t = 2.24, p = .032 **DV4:** CES-D t = -3.49, p <.001	**LOE:** III **Strengths:** low risk, non-invasive intervention **Weaknesses:** Short intervention period, did not include patients who could read, did not involve family members, small sample size, bias might be due to utilization of subjective surveys **Conclusions:**

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Bias: None recognized			Age 65-69: 3 Age 70-75: 7 **Inclusion:** age between 60 and 75 years, heart failure diagnosed for at least 6 months to less than 10 years by a cardiologist, LV EF of **Exclusions:** presence of respiratory diseases such as chronic obstructive pulmonary disease or asthma, diabetes, chronic kidney failure, stroke, or terminal cancer and prior knowledge about telephone self-management programs for heart failure.					A telephone-based self-management program conducted by nurses can improve self-care behaviors, improve cardiac function index as indicated by decreased NT-proBNP levels and increased LV EF, and reduce depression in patients with heart failure. **Feasibility:** Recommended for use in outpatient settings to manage and educate Pts with HF.

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			patients who could not read the prescribed booklets					
Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Ross, A., Ohlsson, U., Blomberg, K., & Gustafsson, M. (2015). Evaluation of an intervention to individualize patient education at a nurse - led heart failure clinic: A mixed - method study. **Country:** Sweden **Funding:** None recognized **Bias:** None recognized	Theory/conceptual framework was not explicitly stated, it can be inferred that the Middle Range Theory of SC of Chronic Illness could have guided the researchers.	**Design:** Mixed-method approach, quasi-experimental method **Purpose:** To evaluate if addressing patient specific questions of patients with HF could individualize education and increase patient satisfaction.	N= 85; 28 F (57) CG: n= 41; 12 F (29) IG: n= 44; 16 F (28) **Setting:** HF clinic **Demographic:** Age: 70; CG 68; IG 71 Marital status: Married: 53; CG 28; IG 25 Single: 32; CG 13; IG 19	**IV:** Pts wrote down questions prior to their visit and received standard EDU as well as personalized EDU based on their questions. **DV1:** Patients perception of involvement in their education **DV2:** Satisfaction	**DV1:** EQ sent to the patients 7 days after visit.	Chi-square test for category data Independent *t*-test and Mann-Whitney *U*-test Significance value was set at 0.05	**DV1:** *p* 0.066 not significant Question "how it could it into daily life" (*p* 0.027) and " I received the information I wanted" (*p* 0.048) Both IG and CG showed perception of empowerment	**LOE:** III **Strengths:** **Weaknesses:** Did not assess why Pts did not bring in questions. **Conclusions:** Having Pts write questions ensure the education is personalized to the patient. The IG reported high levels of empowerment. **Feasibility:**

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			Inclusion: Pts echo verified HF, who came to the clinic for the first time. **Exclusion:** Not able to communicate in Swedish. **Attrition:** 55					Recommended for use by nurses in patient education that are looking for a patient centered approach.
Citation	Theory/ Conceptual Framework	Design/ Method	Sample/ Setting	Major Variables & Definitions	Measurement/ Instrumentation	Data Analysis (stats used)	Findings/ Results	Level/Quality of Evidence; Decision for practice/ application to practice
Tawalbeh, L. I. (2018). The Effect of Cardiac Education on Knowledge and Self-care Behaviors Among Patients With Heart Failure. **Country:** Jordan **Funding:** None recognized	A theory/conceptual framework was not explicitly stated, it can be inferred that the situation-specific theory of HF self-care could have guided the researchers	**Design:** quasi-experiential repeated measure convenience sampling **Purpose:** to test the effect of a cardiac educational program on knowledge and SCBs	N= 127; 55 F (72) CG: n= 65; 25 F (40) IG: n= 62; 30 F (32) **Setting:** a governmental hospital in an outpatient department **Demographic:** Mean age 55.52 CG:	**IV:** educational program with both verbal and written material **DV1:** HF knowledge test **DV2:** SCB **DV3:** hospital admissions	**DV1:** DHFS **DV2:** SCHFI **DV3:** number of admissions	G* power was used determine the right number of participants Power level 0.80, effect size 0.25, *a* level of .05 SPSS version 22 SD	**DV1:** statistically significant difference, F3,113 = 66.06, P < .001, in the change of knowledge mean score between the pretest and the second posttest based on the groups	**LOE:** III **Strengths:** Highlighted the importance of education in improving knowledge and SCBs among patients with HF in Jordan. **Weaknesses:** convenience sampling Limited to just Jordan

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Bias: None recognized		among patients with HF in Jordan	Working 41 Not working 24 Married 26 Unmarried 38 Illiterate 29 Educated 36 IG: Working 41 Not working 21 Married 41 Unmarried 21 Illiterate 26 Educated 36 **Inclusion:** included in the study if they (a) had HF proven by signs and symptoms and chest x-ray studies; (b) had no mental or cognitive problems as determined by a physician; (c) 18 years and older; (d) willing to participate; (e) interviewed as outpatients at				**DV2:** statistically significant difference, F3,113 = 78.14, P <.001 in the change of managemen t SCB mean score between the pretest and the second posttest based on the groups post hoc showed a statistically significant difference, F1,113 = 67.15, P <001, in the change of managemen t SCB mean score between the pretest and the first posttest	Short FU period **Conclusions:** Applying cardiac education program helps improve knowledge and self-care among patients with heart failure. **Feasibility:** Recommended for use by nurses educating Pts on HF. Should be adopted in clinical settings to enhance knowledge and self-care behaviors

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			the cardiac clinic; and (f) patients who had not taken part in a previous structured educational program **Exclusions:** unwillingness to participate and complaint of life-threatening conditions involving planned surgical invasive procedures **Attrition:** 10				There was a statistically significant difference, F1,113 = 511, P = .003, in the change of confidence SCB mean score between the first and second posttests based on the groups. **DV3:** control group has statistically significant higher admission rate, #2 1 = 4.57, P = .03	

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Appendix B

Table 2

Synthesis Table

Author	Abbasi et al.	DelaCruz et al.	Dickson et al.	Gonzaga et al.	Hägglund et al.	Hoover et al.	Korzh et al.	Moon et al.	Ross et al.	Tawalbeh et al.
Year	2018	2015	2014	2018	2015	2017	2016	2018	2014	2018
Level of Evidence	II	II	II	II	II	III	II	III	III	III
Design	RCT	QE-RCT	RCT	RCT	Prospective, RCT	QE comparative descriptive study	RCT Cross-sectional survey	QE in nonequivalent control group	QE mixed methods	QE repeated measure convenience sampling
Study Characteristics										
Setting	H	OP	OP	H	H	H	OP	OP	OP	OP
Received Funding	X		X		X					
Demographics										
Mean Age		61.2			75.5	77.48	63.5		70	55.52
Male (%)	48.33	64.1	46.66	56.25	68.05	48.48		60.52	67.05	56.69
Sample Size	60	39	75	16	72	66	371	38	85	127
Measurement Tool	Iranian heart failure QOLQ	SCHFI	SCHFI	SCHFI	EHFScB9; KCCQ; DHFKS	SCHFI	SECC-S	EHFScB9; NT-proBNP levels; LVEF; CES-D	EQ	DHFKS; SCHFI; number of hospital admissions

Key: **BP –** blood pressure; **CES-D** - Center for Epidemiologic Studies-Depression Scale; **DHFKS** = Dutch HF Knowledge Scale; **DV –** dependent variable; **EDU –** education; **EHFScB9 -** European Heart Failure Self-care Behavior 9-item; **EQ –** empowerment questionnaire; **FU –** follow up; **GE –** group education; **H –** hospital; **IE –** individual education; **IV –** independent variable; **HR –** heart rate; **HRQL** - health-related quality of life; **KCCQ -** Kansas City Cardiomyopathy Questionnaire; **NT-proBNP** – N-terminal pro-brain natriuretic peptide; **OP –** out-patient; **QE –** Quasi-experimental; **QOLQ –** quality of life questionnaire; **HF** – Heart failure; **HL** – health literacy; **LVEF –** left ventricular ejection fraction; **SC –** self-care; **SCC –** self-care confidence; **SCHFI –** self-care heart failure index; **SCM –** self-care management; **SECC-S –** scale for evaluation of clinical condition in hear failure; **SM –** self-management; **V –** verbal education; **W –** written educational material; **Wt -** weight; ↑ - increased; ↑ - decreased; ↔ - not statistically significant; * - statistically significant p-value ≤ 0.050

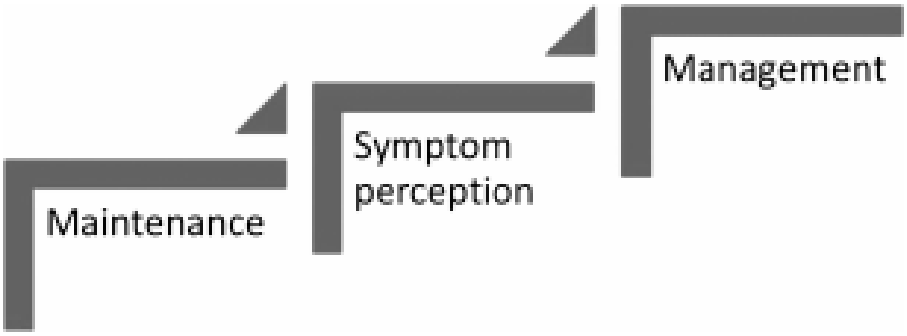
Interventions - IV										
FU phone calls	X					X		X		
IE or GE with V or W	IE V W	IE V W	GE V	IE V	IE W	IE V W	GE V	IE V W	IE V	GE V W
DV										
Quality of life	*↑		↔		↑					
Severity of symptoms	*↓less severe									
Physical limitations	*↑improved									
SC		*↑	*↑	*↑	*↑	*↑ (SM & SCC) ↑ (SCM)		*↑		*↑
HF Knowledge			*↑		*↑					*↑
Readmission					*↓	*↓				*↓
Maintaining appointments						*↑				
Early recognition of symptoms						*↑				
Monitoring BP and HR							↑			
Compliance							↑			
Diary of self control							↑			
CES-D								*↑		
NT-proBNP								*↓		
EQ									↔	

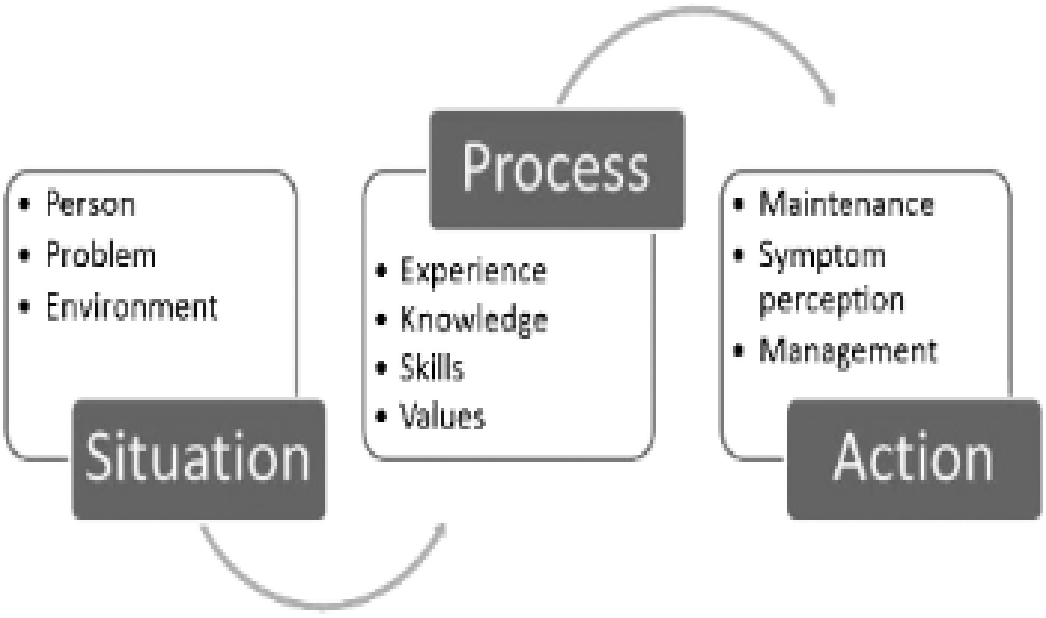
Key: **BP –** blood pressure; **CES-D** - Center for Epidemiologic Studies-Depression Scale; **DHFKS** = Dutch HF Knowledge Scale; **DV –** dependent variable; **EDU –** education; **EHFScB9 -** European Heart Failure Self-care Behavior 9-item; **EQ –** empowerment questionnaire; **FU –** follow up; **GE –** group education; **H –** hospital; **IE –** individual education; **IV –** independent variable; **HR –** heart rate; **HRQL** - health-related quality of life; **KCCQ -** Kansas City Cardiomyopathy Questionnaire; **NT-proBNP** – N-terminal pro-brain natriuretic peptide; **OP –** out-patient; **QE –** Quasi-experimental; **QOLQ –** quality of life questionnaire; **HF** – Heart failure; **HL** – health literacy; **LVEF –** left ventricular ejection fraction; **SC –** self-care; **SCC –** self-care confidence; **SCHFI –** self-care heart failure index; **SCM –** self-care management; **SECC-S –** scale for evaluation of clinical condition in hear failure; **SM –** self-management; **V –** verbal education; **W –** written educational material; **Wt -** weight; ↑ - increased; ↑ - decreased; ↔ - not statistically significant; * - statistically significant p-value ≤ 0.050

Appendix C

Figure 1

The Situation-Specific Theory of Heart Failure Self-Care: Revised and Updated

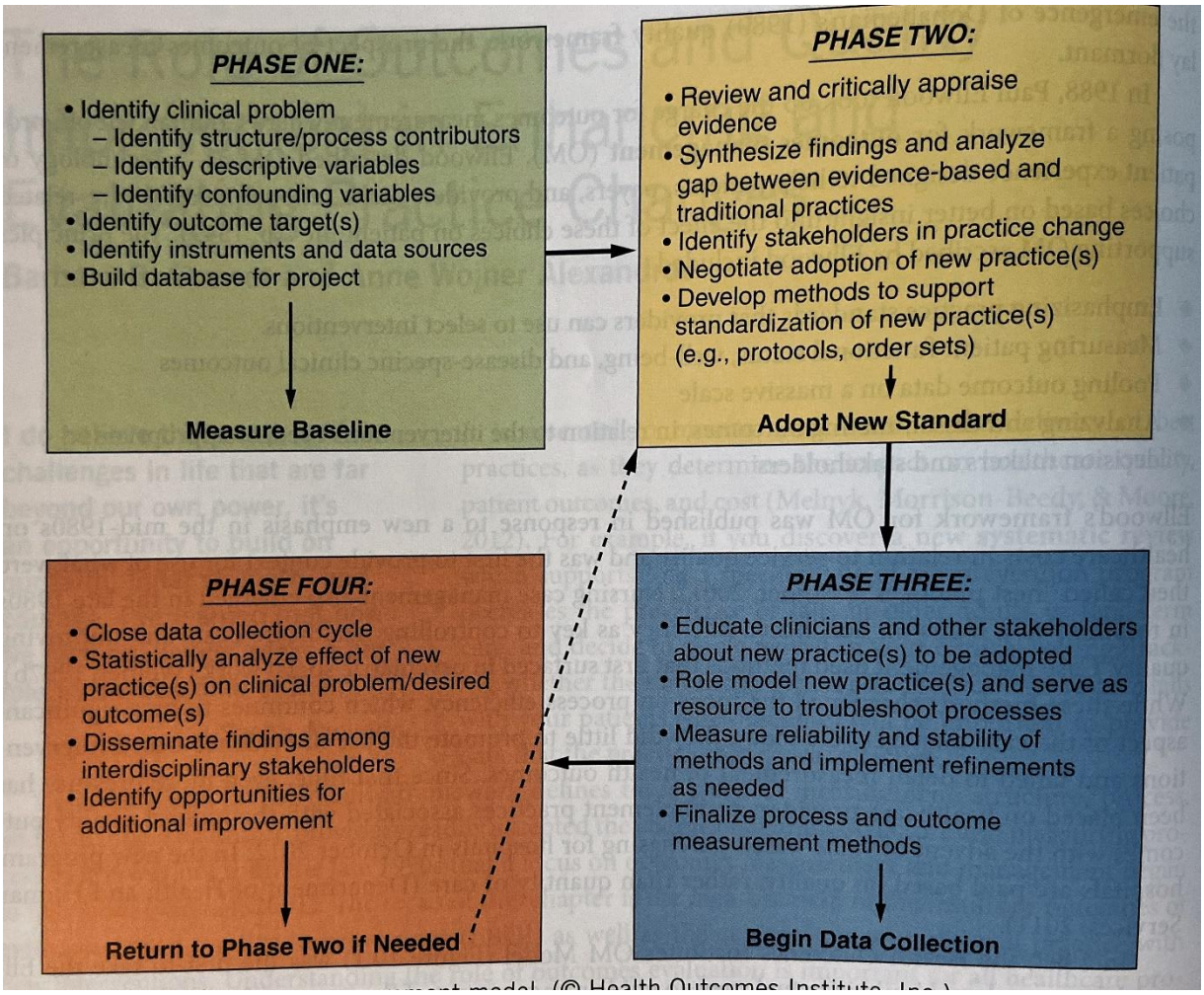




Appendix D

Figure 2

Outcomes Management Model



Appendix E

IRB Approval

ASU Knowledge Enterprise Development

APPROVAL: EXPEDITED REVIEW

Monica Rauton
EDSON: DNP
-
monica.rauton@asu.edu

Dear Monica Rauton:

On 10/15/2019 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Standardized Evidence Based Heart Failure Education delivered as part of a multidisciplinary heart failure management team.
Investigator:	Monica Rauton
IRB ID:	STUDY00010798
Category of review:	(7)(a) Behavioral research
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• KRAMES. Heart Failure Education.pdf, Category: Technical materials/diagrams; • RN LPN Consent.pdf, Category: Consent Form; • Green Light to GO Heart Failure (HF).pdf, Category: Technical materials/diagrams; • Citi training certificate Emily Spano , Category: Other (to reflect anything not captured above); • Patient consent.pdf, Category: Consent Form; • Monthly signs and symptoms tracking sheet.pdf, Category: Technical materials/diagrams; • Rauton_Spano_Updated_10-17-19_Form-Social-Behavioral-Protocol_2018-2.docx, Category: IRB Protocol; • Citi training certificate Dr Rauton , Category: Other (to reflect anything not captured above); • Non-research determination and support of project completion , Category: Off-site authorizations (school

Page 1 of 2

	permission, other IRB approvals, Tribal permission etc); • PDF-Kansas-City-Questionaire.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • SCHFI.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Heart Failure PP to educate RNs and LPNs.pdf, Category: Participant materials (specific directions for them); • TrainingEvalAttituForm.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);

The IRB approved the protocol from 10/15/2019 to 10/14/2024 inclusive. Three weeks before 10/14/2024 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 10/14/2024 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: EMILY SPANO
Monica Rauton
EMILY SPANO

Non-research designation form the VA

DNP EBP project determination of research / non-research
1 message

Schwartz, Eric <Eric.Schwartz@va.gov> Fri, Sep 27, 2019 at 1:46 PM
To: EMILY SPANO <easpano@asu.edu>, "Spano, Emily A." <Emily.Spano@va.gov>
Cc: VHAPHOResearchApprovals <R&D@va.gov>, "Thompson, David" <David.Thompson4@va.gov>, "Fawcett, Janet" <Janet.Fawcett@va.gov>, "Aguayo, Samuel M." <Samuel.Aguayo@va.gov>

Hello Ms. Spano,

I have reviewed your request. Normally we do not review requests, we review detailed study protocols that lay out exactly how the project will be completed. It is the specific written protocol that receives determination that it is not research, not the general idea behind the project. Once the determination is made you are bound to do exactly what is written, which means incomplete project descriptions can leave you with a project you don't have the detail to complete without potentially turning the project into unapproved research. Your request letter however was especially detailed and in the case of this particular project was sufficient to make a determination. Please communicate to your mentors at VA and ASU that this is not the norm, and usually a formal project protocol, written up exactly as if it was a research project going before the IRB, would be required.

The determination whether a project is or is not research is based on the three/four-pronged Common Rule definition of research, supplemented with a few VA-specific tests. Research is an activity designed to use scientific methods to produce generalizable knowledge.

Designed means the activity is planned in advance to be done a certain way. This project qualifies as designed. You have a plan ahead of time to carry it out, and the plan details use of a specific book, with a specific class of patients, and post-hoc analysis using specific survey instruments on specific standardized schedules. This is normal for research projects, pure QI projects, and hybrid research/QI projects, and aside from case reports/case series is rarely used in non-research determinations.

Scientific methods in biomedical research commonly means use of statistics and standardized methods for collecting data. You do not lay out a specific statistical analysis plan, but the detail in your request letter suggests that the project will be done rigorously, and you lay out survey instruments to be used to gather data in a standardized way. This is also normal for well-designed projects that are not research and is also rarely used in non-research determinations. I don't foresee any way in which choosing a specific statistical method to analyze your data could possibly turn this into research, so lack of detail on the specific statistical methods you will use isn't a problem for the determination of this particular project.

Since January of this year two prongs were incorporated in the most recent guidance into the one term generalizable: the knowledge must be extrapolatable to situations or populations other than the individuals being studied, and the results of the work must add to the knowledge base of the field of study. The work may well be extrapolatable to other clinics; indeed your proposal is to extrapolate it from inpatient use in the main hospital to proposed outpatient use in Southeast Clinic. However, you provide sufficient background to conclude that the work is already part of the knowledge base of the field of study. You propose to use an existing published book (intended for this very purpose) to educate patients, and two existing survey instruments to evaluate its effectiveness in the HF population of Southeast Clinic. The book is already in use within PVAHCS, though currently with inpatients in the main hospital rather than outpatients in a CBOC, and is widely used outside the facility as well. It was chosen because it is expected to produce good results, not to test whether it will. (Should it unexpectedly fail to help the patients, that is certainly not planned and therefore not research either.) Evaluating effectiveness to be sure it does what was expected is simply good practice when making an institutional change and does not make it research.

It doesn't receive funding as research, and clearly supports VA's mission. The genesis of this intervention was demonstrated in your background and references to be a genuine facility need. It doesn't propose to randomize subjects to interventions or use a placebo/sham treatment, and it is not an FDA-regulated clinical investigation which could fall under their definition of research instead of or in addition to the Common Rule definition.

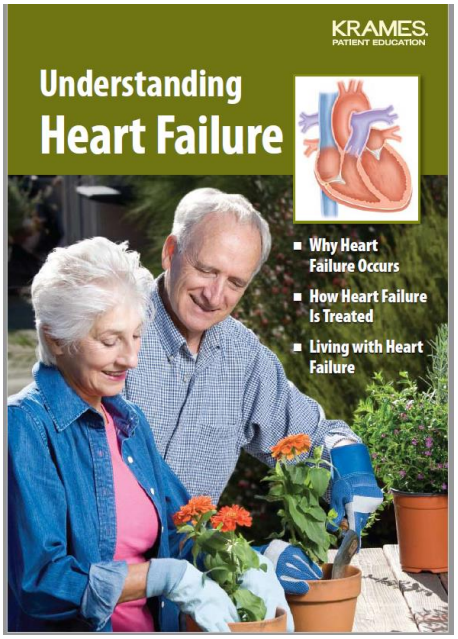
Therefore this project is determined not to be research because it does not meet all four prongs of the definition of research. It does not produce generalizable knowledge which adds to the knowledge base of the field, because the knowledge it is based on is already part of the field, just not in use specifically in your target patient population yet. I wish you the best of luck in completing this project though I don't think you'll need luck. This digitally signed email is your proof of this determination, and may be freely shared with publishers, academic advisors, and others to show that the project was properly determined in accord with VA policy not to be under the oversight of the IRB or VA R&D Committee, and so their review would not be required before you initiate the work. You are the records custodian of this email. Please keep this email for not less than six (6) years from the end of the project, or six (6) years from the date of publication of the last publication to result from this project, whichever is later. You should retain a copy of this email should you leave VA service before that time; however, you must first provide a copy of the email to your VA supervisor, who will then be its custodian until destruction of the email is authorized by the relevant Records Control Schedule. (You may of course provide a copy to your supervisor before that point too.)

Also, please be aware that as a VA project, all documentation of work done on this project is a Federal Record, and you should therefore generate all communications about this project using your VA Outlook email address, not the ASU one, whenever possible. Ensure that emails about the project you do have to generate or receive using the ASU address are saved into the project record stored at VA at your earliest opportunity, but not to exceed 21 days.

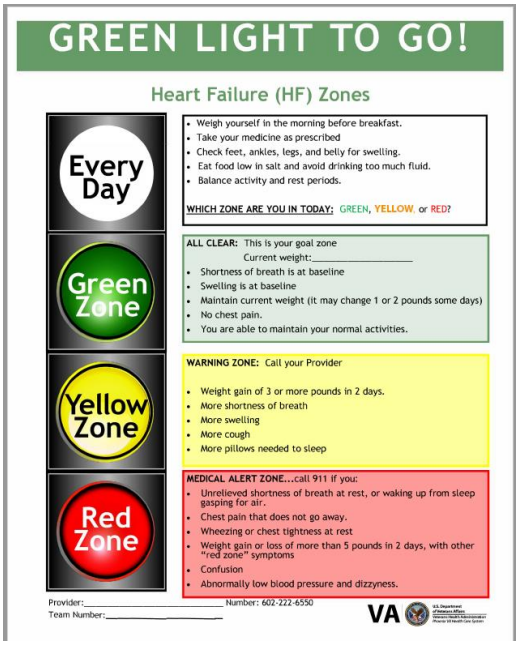
Eric A. Schwartz, PhD VHA LHC YB
Research Health Scientist
Research Information Privacy Officer
Alternate Privacy/FOIA Officer
Phoenix VA Health Care System
650 E. Indian School Rd., RS/151
Phoenix, AZ 85012-1892
602-277-5551 x6880

Appendix F

Krames HF Education Booklet



Green Light to Go Handout


GREEN LIGHT TO GO!

Heart Failure (HF) Zones

Every Day

- Weigh yourself in the morning before breakfast.
- Take your medicine as prescribed
- Check feet, ankles, legs, and belly for swelling.
- Eat food low in salt and avoid drinking too much fluid.
- Balance activity and rest periods.

WHICH ZONE ARE YOU IN TODAY: GREEN, YELLOW, or RED?

Green Zone

ALL CLEAR: This is your goal zone
Current weight:_____

- Shortness of breath is at baseline
- Swelling is at baseline
- Maintain current weight (it may change 1 or 2 pounds some days)
- No chest pain.
- You are able to maintain your normal activities.

Yellow Zone

WARNING ZONE: Call your Provider

- Weight gain of 3 or more pounds in 2 days.
- More shortness of breath
- More swelling
- More cough
- More pillows needed to sleep

Red Zone

MEDICAL ALERT ZONE...call 911 if you:

- Unrelieved shortness of breath at rest, or waking up from sleep gasping for air.
- Chest pain that does not go away.
- Wheezing or chest tightness at rest
- Weight gain or loss of more than 5 pounds in 2 days, with other "red zone" symptoms
- Confusion
- Abnormally low blood pressure and dizzyness.

Provider:_____ Number: 602-222-6550
Team Number:_____

VA

Daily Symptom and Weight Tracking Chart

Heart Failure Daily Self-checkup

Month: _____ ***Refer daily to Green Light To Go sheet for action needed*** **Date:**	**Weight:** Document: Weigh in AM at the same time, same scale' same clothing. Weigh after urination and before eating.	**Blood Pressure:** Document: Check daily at same time of day and record. Best to check 2 hours after taking BP medications.	**Swelling in Feet, Ankles, Legs, and belly** Document: baseline or more swelling	**Shortness of Breath (SOB)** Document: at baseline, more SOB, unrelieved SOB at rest or waking up from sleep gasping for air	**Cough:** Document: no cough, coughing more, wheezing or chest tightness at rest)	**Chest pain:** Document: no chest pain, chest pain that does not go away)	**New or difficulty breathing when lying down**: Document: yes or no & need to sleep on extra pillows or need to sleep in chair
1.							
2.							
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Appendix G

RN Consent

Heart Failure Education

Date_____

Dear *Staff Member* [*participant]*,

I am a graduate student under the direction of Professor Dr. Monica Rauton in the Edson College of Nursing and Health Innovation at Arizona State University. I am inviting you to participate in education on a standardized heart failure educational program to use with heart failure patients at the VA SEC and to complete an evaluation questionnaire.

As part of the project, I will be providing education on the new standardized educational tool to be utilized with HF patients. The tools to be utilized with the HF patients is the Krames patient education booklet titled Understanding Heart Failure, Green Light to Go and a weight and signs/symptoms tracking form. The Krames book and the Green Light to Go are both utilized to teach HF patients admitted to the VA medical center. Utilization of this tool in the SEC will ensure consistency when educating HF patients. The educational session will be conducted during the monthly CME meeting. The total time required for the presentation and questions and answers will be 30 minutes.

At the completion of the training you will be asked to answer a four question questionnaire evaluating your skills, attitudes, and comfort in providing patients with heart failure education. Completion of the training evaluation form is considered your consent to participate. Your participation in this project is voluntary. If you choose not to complete the training evaluation, there will be no penalty. It will not affect your position at VA SEC prior to, during, or after your participation.

If you have any questions concerning this program, please contact the following team members:

Dr. Monica Rauton, DNP, RN, ANP-BC, FNAP at 928-821-3995
Emily Spano BSN, RN at 623-229-9857

This project has been reviewed and approved by the Arizona State University Institutional Review Board. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Sincerely,
Emily Spano BSN, RN, Graduate Student
Dr. Monica Rauton, DNP, ANP-BC, AACC

RN Knowledge Self-Assessment Questionnaire

After attending todays training on HF and the use of the Krames educational booklet, green light to go and s/s-weight-BP tracking form, please rate your understanding of HF and your ability to educate HF patients on symptom recognition and how to respond to symptoms.

How would you rate your...		**Low**		**Medium**		**High**	**Does not apply**
1. Ability to counsel clients about the topic(s) covered in this training	**Before this training**	○ 1	○ 2	○ 3	○ 4	○ 5	○ 9
	After this training	○ 1	○ 2	○ 3	○ 4	○ 5	○ 9
2. Ability to manage clients regarding topic(s) covered in this training	**Before this training**	○ 1	○ 2	○ 3	○ 4	○ 5	○ 9
	After this training	○ 1	○ 2	○ 3	○ 4	○ 5	○ 9
3. Comfort level in providing services to clients in relation to the topic(s) covered in this training	**Before this training**	○ 1	○ 2	○ 3	○ 4	○ 5	○ 9
	After this training	○ 1	○ 2	○ 3	○ 4	○ 5	○ 9
4. Overall knowledge of the topic(s) covered in this training	**Before this training**	○ 1	○ 2	○ 3	○ 4	○ 5	○ 9
	After this training	○ 1	○ 2	○ 3	○ 4	○ 5	○ 9

Appendix H

Patient Consent

Heart Failure Education

Date_____

Dear Participant,

I am a graduate student under the direction of Professor Dr. Monica Rauton in the Edson College of Nursing and Health Innovation at Arizona State University. I am inviting you to participate in this project evaluating the effectiveness of Heart Failure Education.

As part of the project, your care team will be administering the Self-care heart failure index (SCHFI) and the Kansas City Cardiomyopathy Questionnaire (KCCQ-12) to assess the effectiveness of the heart failure education. These questionnaires will be re-administered at 30 days and 60 days after the office visit. The SCHFI contains questions about your heart failure symptoms, actions taken to monitor heart failure and your response to heart failure symptoms. The KCCQ contains questions evaluating how heart failure may affect your life. This information will be used to identify how heart failure is affecting your life as well as assessing your knowledge of heart failure and how you respond to symptoms. The total time required to complete the survey will be approximately 10 to 15 minutes. There will be additional time to answer any questions you may have regarding the survey.

Your participation in the project is voluntary. You can skip questions on the questionnaires if you wish. If you choose not to complete the questionnaires, there will be no penalty. It will not affect the care you receive at the VA prior to, during, or after your participation. You must be 18 years of age or older to participate and be able to read English. There is no known risk greater than those that are associated with everyday types of activity.

Your responses on the questionnaires will be confidential and will be identified by a number. The results of this project may be used in reports, presentations, or publications, but the assigned number will not be connected with your name or other personal identifying information. The ID numbers will be connected to names through a master list and the names will not appear directly on any participant data forms and will be linked only with a list matching your name and ID number in a form that will be kept confidential by the co-investigator.

Completing the questionnaires will be considered your consent to participate.

If you have any questions concerning this program, please contact the following team members:
Dr. Monica Rauton, DNP, RN, ANP-BC, FNAP at 928-821-3995 or Emily Spano BSN, RN at 623-229-9857

This project has been reviewed and approved by the Arizona State University Institutional Review Board. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Sincerely,
Emily Spano BSN, RN, Graduate Student
Dr. Monica Rauton, DNP, ANP-BC, AACC

SCHFI v7,2

Respondent ID Number:_____
Last two digits of birth year and two of birth month. Ex. May 1990 = 9005

Demographics: ___Male; ___Female ___other; _____Age

Race:

____White; _____Hispanic; ____African American; ____Native American; _____Asian; ____Other

Please circle your preference how you would like to be contacted for the follow up questionnaires;

mail – secure messaging - a phone call

SELF-CARE OF HEART FAILURE INDEX

All answers are confidential.

Think about how you have been feeling in the last month as you complete this survey.

SECTION A:

Listed below are behaviors that people with heart failure use to help themselves. How often or routinely do you do the following?

	Never		Sometimes		Always
1. Try to avoid getting sick (e.g., wash your hands)?	1	2	3	4	5
2. Get some exercise (e.g., take a brisk walk, use the stairs)?	1	2	3	4	5
3. Eat a low salt diet?	1	2	3	4	5
4. See your health care provider for routine health care?	1	2	3	4	5
5. Take prescribed medicines without missing a dose?	1	2	3	4	5
6. Order low salt items when eating out?	1	2	3	4	5
7. Make sure to get a flu shot annually?	1	2	3	4	5
8. Ask for low salt foods when visiting family and friends?	1	2	3	4	5
9. Use a system or method to help you remember to take your medicines?	1	2	3	4	5
10. Ask your healthcare provider about your medicines?	1	2	3	4	5

1

SCHFI version 7.2, edited 5-10-2018

SECTION B:

Listed below are changes that people with heart failure commonly monitor. How often do you do the following?

	Never		Sometimes		Always
11. Monitor your weight daily?	1	2	3	4	5
12. Pay attention to changes in how you feel?	1	2	3	4	5
13. Look for medication side-effects?	1	2	3	4	5
14. Notice whether you tire more than usual doing normal activities?	1	2	3	4	5
15. Ask your healthcare provider how you're doing?	1	2	3	4	5
16. Monitor closely for symptoms?	1	2	3	4	5
17. Check your ankles for swelling?	1	2	3	4	5
18. Check for shortness of breath with activity such as bathing and dressing?	1	2	3	4	5
19. Keep a record of symptoms?	1	2	3	4	5

The last time you had symptoms…

(circle one number)

	Have not had symptoms	I did not recognize the symptom	Not Quickly		Somewhat Quickly		Very Quickly
20. How quickly did you recognize that you had symptoms?	N/A	0	1	2	3	4	5
21. How quickly did you know that the symptom was due to heart failure?	N/A	0	1	2	3	4	5

SECTION C:

Listed below are behaviors that people with heart failure use to control their symptoms. **When you have symptoms, how likely are you to use one of these?**

(circle **one** number for each treatment)

	Not Likely		Somewhat Likely		Very Likely
22. Further limit the salt you eat that day?	1	2	3	4	5
23. Reduce your fluid intake?	1	2	3	4	5
24. Take a medicine?	1	2	3	4	5
25. Call your healthcare provider for guidance?	1	2	3	4	5
26. Ask a family member or friend for advice?	1	2	3	4	5
27. Try to figure out why you have symptoms?	1	2	3	4	5
28. Limit your activity until you feel better?	1	2	3	4	5

Think of a treatment you used the last time you had symptoms… (circle one number)

	I did not do anything	Not Sure		Somewhat Sure		Very Sure
29. Did the treatment you used make you feel better?	0	1	2	3	4	5

SECTION D:

In general, how confident are you that you can:

(Circle one number for each statement)

	Not Confident		Somewhat Confident		Extremely Confident
30. Keep yourself stable and free of symptoms?	1	2	3	4	5
31. Follow the treatment plan you have been given?	1	2	3	4	5
32. Persist in following the treatment plan even when difficult?	1	2	3	4	5
33. Monitor your condition routinely?	1	2	3	4	5
34. Persist in routinely monitoring your condition even when difficult?	1	2	3	4	5
35. Recognize changes in your health if they occur?	1	2	3	4	5
36. Evaluate the importance of your symptoms?	1	2	3	4	5
37. Do something to relieve your symptoms?	1	2	3	4	5
38. Persist in finding a remedy for your symptoms even when difficult?	1	2	3	4	5
39. Evaluate how well a remedy works?	1	2	3	4	5

THANK YOU FOR COMPLETING THIS SURVEY!

KCCQ

Kansas City Cardiomyopathy Questionnaire (KCCQ-12)

The following questions refer to your **heart failure** and how it may affect your life. Please read and complete the following questions. There are no right or wrong answers. Please mark the answer that best applies to you.

1. **Heart failure** affects different people in different ways. Some feel shortness of breath while others feel fatigue. Please indicate how much you are limited by **heart failure** (shortness of breath or fatigue) in your ability to do the following activities over the past 2 weeks.

Activity	**Extremely** Limited	**Quite a bit** Limited	**Moderately** Limited	**Slightly** Limited	**Not at all** Limited	Limited for other reasons or did not do the activity
a. Showering/bathing	O	O	O	O	O	O
b. Walking 1 block on level ground	O	O	O	O	O	O
c. Hurrying or jogging (as if to catch a bus)	O	O	O	O	O	O
	1	2	3	4	5	6

2. Over the past 2 weeks, how many times did you have **swelling** in your feet, ankles or legs when you woke up in the morning?

Every morning	3 or more times per week but not every day	1-2 times per week	Less than once a week	Never over the past 2 weeks
O	O	O	O	O
1	2	3	4	5

3. Over the past 2 weeks, on average, how many times has **fatigue** limited your ability to do what you wanted?

All of the time	Several times per day	At least once a day	3 or more times per week but not every day	1-2 times per week	Less than once a week	Never over the past 2 weeks
O	O	O	O	O	O	O
1	2	3	4	5	6	7

4. Over the past 2 weeks, on average, how many times has **shortness of breath** limited your ability to do what you wanted?

All of the time	Several times per day	At least once a day	3 or more times per week but not every day	1-2 times per week	Less than once a week	Never over the past 2 weeks
O	O	O	O	O	O	O
1	2	3	4	5	6	7

5. Over the past 2 weeks, on average, how many times have you been forced to sleep sitting up in a chair or with at least 3 pillows to prop you up because of **shortness of breath**?

Every night	3 or more times per week but not every day	1-2 times per week	Less than once a week	Never over the past 2 weeks
O	O	O	O	O
1	2	3	4	5

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6. Over the past 2 weeks, how much has your **heart failure** limited your enjoyment of life?

It has **extremely** limited my enjoyment of life	It has limited my enjoyment of life **quite a bit**	It has **moderately** limited my enjoyment of life	It has **slightly** limited my enjoyment of life	It has **not limited** my enjoyment of life at all
O	O	O	O	O
1	2	3	4	5

7. If you had to spend the rest of your life with your **heart failure** the way it is right now, how would you feel about this?

Not at all satisfied	Mostly dissatisfied	Somewhat satisfied	Mostly satisfied	Completely satisfied
O	O	O	O	O
1	2	3	4	5

8. How much does your **heart failure** affect your lifestyle? Please indicate how your **heart failure** may have limited your participation in the following activities over the past 2 weeks.

Activity	**Severely** Limited	Limited **quite a bit**	**Moderately** limited	**Slightly** limited	**Did not** limit at all	Does not apply or did not do for other reasons
a. Hobbies, recreational activities	O	O	O	O	O	O
b. Working or doing household chores	O	O	O	O	O	O
c. Visiting family or friends out of your home	O	O	O	O	O	O
	1	2	3	4	5	6

Appendix I

Budget

Phase	Activities	Cost	subtotal
Preparation	Design tracking tool for patients to monitor weight and s/s	*5hrs@$48	$240
	Print tracking tool for patients to monitor weight and s/s	**90 for staff & 50 for patients 140@$0.08***	$11.20
	Pay licensing fee for use of KCCQ	*$115	$115
	Design RN Self-Assessment questionnaire and demographics form	*5hrs@$48	$240
	Print Self-Assessment questionnaire demographics form, KCCQ, and SCHFI v.7.12	**90 for staff & 50 for patients 140@$0.08***	$11.20
	Design staff consent form	*5hrs@$48	$240
	Print staff consent form	**90 for staff & 50 for patients 140@$0.08***	$11.20
	Design patient consent form	*5hrs@$48	$240
	Print patient consent form	**90 for staff & 50 for patients 140@$0.08***	$11.20
	Order Krames HF book and Green Light to Go form, one for each staff members as well as to be given to patients	**90 for staff & 50 for patients 140@$4	$560
	Create power point to be utilized when educating staff	*5hrs@$48	$240
Delivery	Education of staff at staff meetings	*10hrs@$48	$480
	Attend staff meetings during project timeline	*25hrs@$48	$1200

	for reinforcement and to answer questions regarding new patient education		
Evaluation	Review and analysis of results	*10hrs@48/hr	$480
Total Direct costs	**$4,079.80**		
Indirect costs	Including facilities, telephone, maintenance and repairs, clerical and administrative costs, and office supplies	Calculated based on 10% of total direct costs	$396.48
Total Costs Direct and Indirect	**≈$4,476.00**		

Appendix J

Table 3

Profile Plot of RNs pre and post scores

Profile Plot of Selected Variables grouped by Label

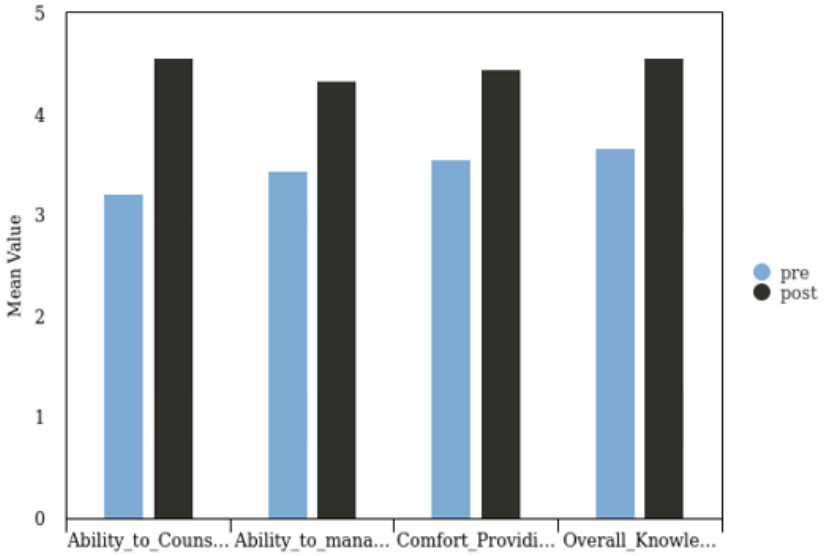

Table 4

Summary Statistics for RNs pre and post scores

Summary Statistics Table for Interval and Ratio Variables by Label

Variable	*M*	*SD*	*n*	SE_M	Min	Max	*Mdn*
Comfort_Providing_Services_to_HF							
pre	3.56	1.24	9	0.41	1.00	5.00	4.00
post	4.44	0.53	9	0.18	4.00	5.00	4.00
Ability_to_Counsel_Patients							
pre	3.22	1.30	9	0.43	1.00	5.00	3.00
post	4.56	0.53	9	0.18	4.00	5.00	5.00
Ability_to_manage_the_Patients							
pre	3.44	1.01	9	0.34	2.00	5.00	3.00
post	4.33	0.87	9	0.29	3.00	5.00	5.00
Overall_Knowledge_of_the_topic							
pre	3.67	0.87	9	0.29	3.00	5.00	3.00
post	4.56	0.53	9	0.18	4.00	5.00	5.00

Note. '-' denotes the sample size is too small to calculate statistic.

Appendix K

Table 5

KCCQ average score, initial, 30 day and 60 day

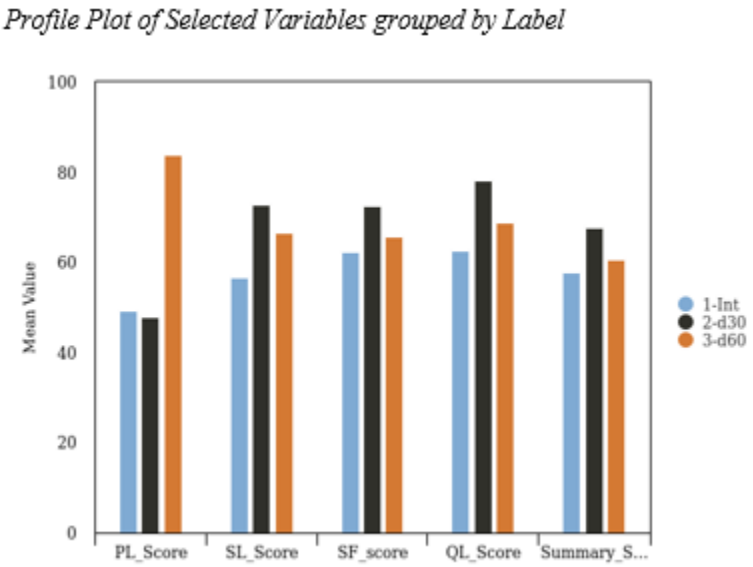

Table 6

SCHFI average score, initial, 30 day and 60 day