

University of San Diego

Digital USD

Doctor of Nursing Practice Final Manuscripts

Theses and Dissertations

Spring 5-27-2017

Improving Self-Care Management in Heart Failure Patients

Sible Rebello

University of San Diego, siblerebello@yahoo.com

Follow this and additional works at: <https://digital.sandiego.edu/dnp>



Part of the [Nursing Commons](#)

Digital USD Citation

Rebello, Sible, "Improving Self-Care Management in Heart Failure Patients" (2017). *Doctor of Nursing Practice Final Manuscripts*. 47.

<https://digital.sandiego.edu/dnp/47>

This Doctor of Nursing Practice Final Manuscript is brought to you for free and open access by the Theses and Dissertations at Digital USD. It has been accepted for inclusion in Doctor of Nursing Practice Final Manuscripts by an authorized administrator of Digital USD. For more information, please contact digital@sandiego.edu.

Improving Self-Care Management in Heart Failure Patients

Sible Rebello, RN, BSN, CCRN, DNP

University of San Diego

Hahn School of Nursing and Health Science:

Beyster Institute for Nursing Research

Abstract

This evidence-based project aimed to improve self-care and decrease the 30-day readmission rates in cardiology clinic heart failure (HF) patients. Thirty-day HF readmission rates, pose a financial burden to hospitals and consistent patient engagement and education in self-care among HF patients can decrease health care utilization, reduce mortality and improve quality of life. Patients received HF education during the first post-discharge clinic visit followed by weekly telephone calls. The Self-Care of Heart Failure Index (SCHFI) was administered to assess baseline knowledge of the self-care and reevaluated at the end of 30 and 90 days. None of the participants were readmitted within 30 days including all cause readmissions. Enhanced SCHFI questionnaire knowledge scores were seen at one month and three months indicating higher levels of knowledge of HF care. At one month, there was a 24% increase in knowledge scores in maintenance, 22.6% increase in management and 29.3% increase in confidence scale. At the end of 3 months there were 29%, 39% and 35% increase in maintenance, management and confidence scales respectively. The evidence-based project held in a cardiology clinic was successful in its efforts to decrease the 30-day readmissions rate and improved self-care and knowledge of heart failure among the participants.

Key words: heart failure, self-care management, decreases 30-day readmissions

Improving Self-Care Management in Heart Failure Patients

Introduction/Background

More than \$39 billion is spent annually for heart failure (HF) care in the United States (US) (Willey, 2012), and there are more than 1 million hospitalizations per year with a primary diagnosis of HF (Sales et al., 2014). Mortality rates among HF patients persist at nearly 50% within five years of diagnosis (McClintock, Mose, & Smith, 2014). In the United States, almost 5.7 million people are living with HF. There is a projected 46% rise in HF from 2012 to 2030 (Ziaeeian & Fonarow, 2015). An estimated 1 million HF hospitalization discharges were reported in 2010, and in 2012, total costs for HF was \$30.7 billion. Between 2009-2012 thirty-day readmission rates for HF were 23.0% according to Medicare from. The Hospital Readmission Reduction Program (HRRP), a part of the Affordable Care Act, currently assesses risk-adjusted 30-day readmission rates for HF (Ziaeeian & Fonarow, 2015). Thirty-day HF readmission rates pose a financial burden to hospitals after the Centers for Medicare and Medicaid Services began to penalize hospitals if risk-adjusted HF readmission rates were greater than an anticipated rate (Centers for Medicare & Medicaid Services, 2015). Non-adherence to medication, lack of awareness of exacerbating HF symptoms and treatment plans, and irregular follow-up visits have resulted in frequent readmissions (Vedel & Khanassov, 2015). Consistent patient engagement and education in self-care can empower patients to independently recognize early warning signs of worsening HF ultimately, decreasing HF health care utilization, reducing mortality and improving quality of life (QOL) (Siabani, Driscoll, Davidson, & Leeder, 2016). Health care professionals can play a vital role by providing HF education on self-care skills, including weight monitoring, maintaining a low sodium diet, medication adherence, symptom monitoring, exercise, preventive care (e.g., hand washing, dental health, maintenance of scheduled

immunizations), smoking cessation and fluid restriction (Riegel et al., 2009). The cardiology practice providers were unaware of the 30- day readmission rate of patients with HF. They did not have a structured or individualized HF education program to improve the self-care behaviors among these patients.

Purpose/Aims

The purpose of this evidence-based project was to improve self-care in patients with heart failure and decrease the 30-day readmission rate. The intended primary outcome would be an improvement in self-care behaviors. Improvement in self-care behaviors is measured by pre-test and post-test using the Self-Care of Heart Failure Index v.6.2 (SCHFI) scoring at baseline, one month and three months. The secondary outcome was to decrease the 30-day readmission rates in HF patients in the study to <15%.

Review of Literature

The American College of Cardiology Foundation and the American Heart Association (ACC/AHA) guidelines and AHA position statements emphasize the need for transitional care programs. Implementing patient education regarding self-care was found to reduce health care utilization and improve outcomes in HF patients (Yancy et al., 2013, Riegel et al., 2009).

A systematic review and meta-analysis of 41 randomized controlled trials, conducted by Vedel & Khanassov, (2015) determined the effect of transitional care interventions (TCIs) on congestive heart failure patients, their hospital readmissions and emergency department visits. Forty-one randomized controlled trials showed a significant risk reduction in hospital readmissions/ED visits by 8% and 29% respectively by the TCIs. Combining home visits with telephone follow-up, clinic visits or both were included in the high-intensity transitional care interventions. Regardless of the follow-up duration, use of the high intensity TCIs decreased the

readmission risk. Moderate intensity TCIs (e.g., only home visits or a combination of telephone follow-up with periodic follow-up clinic visits) found to be effective if employed for at least 6 months. Transitional care interventions with low intensity (e.g., only outpatient clinic follow-up or telephone follow-up) were not efficacious.

In a systematic review and meta-analysis to demonstrate and calculate the individual interventions used in multicomponent outpatient HF management programs, Wakefield, Boren, Groves, & Conn (2013) found a significant reduction in HF, admissions, clinic visits and improved QOL among HF patients. This meta-analysis assessed the efficacy of multicomponent outpatient HF management programs, their content, and the frequency of use among HF patients, and patient outcomes. The individual interventions in the meta-analysis included patient education, symptom monitoring by patients and staff, and medication adherence. Symptom recognition, self-monitoring and medication review were the frequent teaching topics. Compared to the control subjects, mortality (21 of 30 studies), readmission rates (ES = 0.157, $P < .001$) and cost (ES = 0.17, $p = .008$) were significantly lower in treatment subjects and QOL (ES = 0.231, $p = .007$), and were significantly better in treatment subjects with significantly higher patient satisfaction (ES = 0.338, $p = .003$).

The SCHFI is a validated tool to measure the three self-care behaviors that maintain physiological stability (maintenance), the response to symptoms when they occur (management) and the ability to perform self-care maintenance (confidence) in HF patients (Riegel, Lee, Dickson, & Carlson, 2009). The SCHFI is a 22-item instrument scale that captures the three hypothetically derived elements of HF self-care: maintenance, management, and confidence. Vellone et al, 2013, implemented a confirmatory factor analysis (CFA) on SCHFI scales to test the original hypothesis on 659 HF patients in Italy with limited success. Then, to determine the

presence of separate scale dimensions the researchers used exploratory factor analysis followed by CFA in a discrete sub-sample. Exceptional fit indices on construct validity were exhibited on individual scales (CFI = .92, RMSEA = .05 for the maintenance, CFI = .95, RMSEA = .07 for the management; CFI = .99, RMSEA = .02 for the confidence). Test-retest reliability, internal consistency and contrasting groups validity were also supported. This evidence supports the use of the SCHFI scale in clinical research. Symptom monitoring and adherence behaviors (e.g., monitoring weight, eating a low-salt diet, taking medications) are included on the maintenance section (ten items). The management section (six items) focuses on the ability of the patient to recognize symptoms and implement and evaluate treatments (e.g., fluid restriction, provider consult and extra water pill intake). Self-care processes (e.g., identifying the changes in the symptoms, preventing symptom onset, patients' perceived ability of engagement) are estimated in the confidence section (six items). A standardized score from 0-100 was used, in which each scale uses a 4-point self-report response. Higher scores suggested improved self-care (Vellone et al., 2013) (See Appendix A).

EBP Project Plan Process

This evidence-based project was implemented in a cardiology clinic caring for HF patients, following post-hospital discharge. Data were obtained from 114 medical records to determine the readmission rate for the study site between 07/02/2015 and 08/19/2016. The hospitalized patients who are discharged with the diagnosis of HF and to be followed up by the cardiology clinic where the project is implemented are identified. To ensure adherence with follow-up visits and to enhance the knowledge of HF self-care, HF patients were contacted via telephone between 48-72 hours post-discharge to make clinic appointments within in one week of hospital discharge (Sales et al., 2014, Brandon, Schuessler, Ellison, & Lazenby, 2009).

The educational program for these post-hospital discharge HF patients included a follow up visit lasting about an hour. These visits included assessment of pre- and post-knowledge of self-care utilizing the SCHFI questionnaire. A face-to-face, office, educational session using the Krames StayWell “Living with Heart Failure” book and the Krames StayWell fast guide “Managing Heart Failure” along with 15-20 minutes of weekly telephone follow-up was also included.

The SCHFI was administered during the first post-discharge clinic visit to assess baseline knowledge of the self-care. During this visit, patients received HF education (along with an educational handout) regarding medication adherence, low sodium diet, daily weight monitoring, symptom monitoring, blood pressure monitoring, exercise, preventive care, smoking cessation, and when to call the office with symptoms of exacerbation. After this visit, weekly telephone calls were made to assess patients for signs and symptoms of HF. The calls were also used to reinforce teaching when appropriate and to intervene with clinic appointments, if necessary. Four weeks post-discharge, patients were seen again in the clinic to assess for HF signs and symptoms and to complete the SCHFI questionnaire. Self-care behaviors were then evaluated using the SCHFI questionnaire and 30-day readmission rates were calculated.

Post-hospitalized HF patients were able to contact a provider via telephone and/or text messages to ask questions regarding HF symptoms or for clarification regarding the use of medications. Immediate adjustments to medication regimens or treatment plans were readily provided if needed. The communication prompted additional dialogues with the patients including the importance of a low sodium diet with all the patients and caregivers during this time.

Follow-up weekly telephone calls and monthly visits continued for three months. Patients filled out the SCHFI questionnaire at baseline, after one month and at the end of three months. The benchmark for 30-day readmission rate is <15% and the self-care benchmark is at least a 10% increase in SCHFI scores in maintenance, management, and confidence level.

Results

Data obtained from 114 medical records determined the 30-day readmission rate for HF patients at the study site between 07/02/2015 and 08/19/2016 was 23%, compared with the national average of 21.9% (“Medicare.gov,” n.d). Ten patients discharged home with a primary or secondary diagnosis of HF without hospice care were recruited during the time period. Seven of the participants were male and the participant’s ejection fractions varied between 20-45%. The participant’s ethnicity was Non-Hispanic White (33%), Non-Hispanic Black (22%) and Hispanic (44%). Nine of the ten participants completed the first month of the study, and three participants were able to complete the three months as planned.

None of the participants were readmitted within 30 days including all cause readmissions. Enhanced SCHFI questionnaire knowledge scores were seen at one month and three months indicating higher levels of knowledge of HF care. At one month, there was a 24% increase in knowledge scores in maintenance, 22.6% increase in management and 29.3% increase in confidence scale. At the end of 3 months there were 29%, 39% and 35% increase in maintenance, management and confidence scales respectively (See Appendix B).

Discussion

Improved self-care and a decrease in 30-day readmissions among the patients, who participated in the evidence-based project, highlights the significance of integrating individual educational sessions for HF patients with the initial post-hospital discharge visit.

Improvement in self-care behaviors among heart failure (HF) patients impacts the advancement of HF through two different mechanisms. Self-care alleviates the systemic inflammatory response and it partly neutralizes and blocks neurohormonal activity. Consequences of neurohormonal activation such as episodes of congestion as well as dyspnea and fatigue, is reduced with self-care maintenance behaviors. Reduction in neurohormonal activation is also associated with adherence to sodium restriction (Riegel, Dickson, & Faulkner, 2016).

Individuals who effectively recognize and manage their symptoms are less prone to HF progression (Riegel et al., 2016). Heart failure management decreases the chances of elevated levels of biomarkers related to neurohormonal activation and systemic inflammation (Riegel et al., 2016). Patients with poor self-care behaviors had more emergency department visits and hospitalization. Patients need more than a brief conversation with a provider to acquire self-care behavior skills (Riegel et al., 2016).

Once a patient is diagnosed with HF, patients are unclear about their role in managing HF. The discharged patient and the family or the caregiver continues HF care at home. Effective participation is not possible if the patients and caregivers do not understand what care is required and significance or the barriers in the engagement of the care (Willey, 2012). It was noted that post discharge HF patients and caregivers could not recollect the information or teaching given during hospitalization and or upon discharge. This is most likely due to overwhelming factors experienced during hospitalization such as different medical procedures.

Restricting fluid intake, weighing daily to identify weight increase and notifying the provider regarding HF symptoms (e.g., fatigue, nausea or poor appetite) are poorly reported self-care behaviors. A systematic review of health outcomes revealed fewer hospital readmissions for

HF patients who took action after recognizing signs and symptoms. These patients used extra diuretic doses in response to increased weight (Barnason, Zimmerman, & Young, 2011).

Patients came to the clinic for their initial post-discharge visit within a week. At this time they were recovering slowly and were ready to absorb information regarding their disease and self-care behaviors. These follow-up visits provided opportunities to answer patient questions and clarify what to expect and what to look for at home. Initial encounters covered several topics including the “Managing Heart Failure” brochure handout.

The visit started with the explanation of heart function and the condition of HF using visual aids and heart models in the office. During the encounter, the provider described heart failure medications and benefits of controlling HF symptoms and improving heart function. The significance of smoking cessation, blood pressure monitoring, daily weight monitoring and further actions to take in the event of weight increase were also discussed. Information on low sodium diets were given along with handouts on the sodium content of most available foods and how to calculate the sodium content of each food as well as their daily intake of sodium. The patients were taught about monitoring the signs and symptoms of heart failure and how to notify the provider’s office if necessary.

Some of the patients contacted the provider by text messages and telephone calls in addition to the regular weekly support calls. They comfortably discussed blood pressure changes and weight changes. Patients came prepared for their monthly visits with blood pressure and weight logs. Some patients downloaded a phone application where they saved all their values.

When formulating patient care plans for chronic illness management, providers advocate for the inclusion of family caregivers to share in the patient’s overall health care goals. Directing family members in setting goals and supporting patient’s self-care behaviors can achieve

enhanced family involvement. It is observed that there is an interrelation between the goals established by the patient and the family caregivers (Coleman & Min, 2015).

Family members and caregivers were intimately involved in this project while teaching self-care behaviors to the patient. Family members were very interested in learning about the process of self-care care behaviors. These family members showed they were invested in the patient's health. They were very compliant with cooking a low sodium diet and supported the patients with self-care behaviors.

Sustainability

The improved self-care behaviors as revealed in the post-test SCHFI questionnaires increased the chances of sustainability of this project. Education regarding self-care skills can be incorporated with regular follow-up post discharge visits in the cardiology clinic. Empowering the patient and involving caregivers with self-care behaviors was essential along with strong support from the providers. Effective self-care skills can reduce 30-day HF readmissions and all cause hospital readmissions thus decreasing health care costs.

Factors that impact self-care among the HF patients include depression, lack of social support, sensory and cognitive impairments, decreased functional ability, low literacy levels and unawareness of how the health system functions. Factors that can improve self-care behaviors include increased educational levels along with greater mental and functional abilities and strong support from the family caregivers or friends (Barnason et al., 2011).

Improved interdisciplinary communication and collaboration among the health care teams will minimize the delay in follow-up visits among HF patients. Communication among the health care providers will also help to identify barriers that make achieving the self-care

behaviors difficult for HF patients. By successfully identifying and minimizing these barriers, HF patients can continue self-care behaviors ultimately, reducing hospital readmissions.

Cost/Benefit Analysis

Medicare expenditures are 17.4 billion annually for unplanned HF readmissions, and an early post-discharge visit is recommended for all patients (Gheorghiade, Vaduganathan, Fonarow, & Bonow, 2013). To decrease readmissions, new incentives are made by the Patient Protection Affordable Care Act of 2010. Hospitals can lose up to three percent of Medicare reimbursements with high readmissions (Bradley et al., 2013). HF patient's 30-day readmissions are considered to be an indicator of poor care quality and are associated with greater health care costs. An average cost per HF readmission is \$13,000 according to the Centers for Medicare and Medicaid Services, and it is estimated that one in four HF patients are readmitted (CMS, 2015).

The yearly salary for a full-time APRN is \$120,000. Educational materials incur cost ranging from \$600 to \$3000 yearly. Salary and educational material supply costs total roughly \$123,600 for this program. Twenty-seven of 114 HF patients were readmitted prior to implementation of this project. Considering the cost of HF per Medicare readmission is \$13,000 (CMS, 2015), and calculating hospitalization based on the readmissions of the last twelve months data, an estimated cost for 27 heart failure 30-day readmissions is \$351,000. An estimated annual cost savings would be \$227,400 provided there were no HF patient readmissions.

In this evidence-based project to improve self-care in HF, nine patients completed one month of the project and none were readmitted within the first 30-days. Compared with the cost of \$13,000 per Medicare HF readmission, the estimated cost savings for this project was

\$117,000. Hospitals may appreciate an additional incentive related to a decreased HF readmission rate as per Patient Protection Affordable Care Act of 2010 (See Appendix C).

Conclusions

As October 1, 2012, Medicare financially penalized hospitals with higher than average rates of risk-adjusted 30-day readmissions in heart failure. Decreasing HF readmission rates will save hospitals from paying penalties to Medicare (McCarthy, 2012). HF patients are accountable for most of their care at home and self-care management plays a significant role in their lives. Knowledge regarding HF interventions can decrease readmissions, clinic visits and costs, and can improve the quality of life and satisfaction among HF patients (Wakefield, Boren, Groves, & Conn, 2013). The rate of readmission of HF patients is not decreased by providing post discharge health services alone, but by increasing the gravity of the service, improving communication among all health care professionals and monitoring the quality of services. Modifiable factors to decrease unintended HF readmissions must be assessed in order to avoid the 30-day penalty instituted by the Affordable Care Act. Transitional care programs including educating HF patients, telephone follow-up calls, post-discharge early-assessment follow-up and medication reconciliation and by including caregivers, home visits and provider handoffs, can reduce unfavorable clinical incidents and improve the care quality and decrease the cost of care (American Heart Association, 2015). The evidence-based project held in a cardiology clinic was successful in its efforts to decrease the 30-day readmissions rate and improved self-care and knowledge of heart failure.

Implications for Nursing Practice

Advanced practice providers trained in HF management may lead post-hospital discharge follow-up programs for HF patients. Such programs can improve patient outcomes and quality of

life while reducing health care costs. While empowering the HF patients in self-care, advanced practice providers can also engage the family caregivers by promoting goal attainment, thereby improving their involvement in the patient's self-care behaviors. Minimizing the delay in transitional care and the follow-up visits can employ self-care behaviors interventions as early as possible in HF patients.

Transitional care is very important, as HF patients are at extreme risk for readmission in the first weeks following hospital discharge. Follow-up visits with primary care providers focusing on individual educational sessions as soon as possible will help them to improve self-care behaviors. Even though educational sessions can be helpful before discharge, patients are not ready to perceive all the information at that point. HF patients had a better understanding of the disease and they are ready to employ their self-care behaviors during post-hospitalization follow-up visits. Educational sessions to teach HF patients to improve their self-care behaviors soon after the discharge process will enable patients to employ these behaviors as soon as possible. This in turn can empower them to improve self-care and symptom monitoring to reduce the occurrence of 30-day hospital readmissions.

References

- American Heart Association (2015). Transitions of care in heart failure: A scientific statement from the American Heart Association. *Circulation: Heart Failure*, 8, 384-409. <http://dx.doi.org/10.1161/HHF.0000000000000006>.
- Barnason, S., Zimmerman, L., & Young, L. (2011, July 18). An integrative review of interventions promoting self-care of patients with heart failure. *Journal of Clinical Nursing*, 21, 448-475. <http://dx.doi.org/10.1111/j.1365-2702.2011.03907.x>
- Bradley, E. H., Curry, L., Horwitz, L. I., Sipsma, H., Wang, Y., Walsh, M. N., ... Krumholz, H. M. (2013, July 1). Hospital strategies associated with 30-day readmission rates for patients with heart failure. *Circulation: Cardiovascular Quality and Outcomes*, 6, 444-450. <http://dx.doi.org/10.1161/CIRCOUTCOMES.111.000101>
- Brandon, A. F., SchuesslerKathy, J. B., Ellison, K. J., & Lazenby, R. B. (2009). The effects of an advanced practice nurse led telephone intervention on outcomes of patients with heart failure. *Applied Nursing Research*, 22, e1-e7. <http://dx.doi.org/10.1016/j.apnr.2009.02.003>
- Centers for Medicare & Medicaid Services (2015). Guide to preventing readmissions among racially and ethnically diverse Medicare beneficiaries. Retrieved from https://www.cms.gov/About-CMS/Agency-information/OMH/Downloads/OMH_Readmissions_Guide.pdf
- Coleman, E. A., & Min, S. (2015). Patient's and family caregivers' goals for care during transitions out of the hospital. *Home Health Care Services Quarterly*, 34, 173-184. <http://dx.doi.org/10.1080/01621424.2015.1095149>

Gheorghide, M., Vaduganathan, M., Fonarow, G. C., & Bonow, R. O. (2013, January 29).

Rehospitalization of heart failure: Problems and perspectives. *Journal of the American College of Cardiology*, *61*, 391-403. <http://dx.doi.org/10.1016/j.jacc.2012.09.038>

McCarthy, D. (2012). University of California, San Francisco Medical Center: Reducing

readmissions through Heart Failure care management. Retrieved from

http://www.commonwealthfund.org/~media/files/publications/case-study/2013/jan/1635_mccarthy_care_transitions_ucsf_case_study_v3.pdf

McClintock, S., Mose, R., & Smith, L. F. (2014). Strategies for reducing the hospital

readmission rates of heart failure patients. *The Journal for Nurse Practitioners*, *10*, 430-433. <http://dx.doi.org/10.1016/j.nurpra.2014.04.005>

Medicare.gov hospital compare. (n.d). Retrieved August 10, 2016, from

<https://www.medicare.gov/hospitalcompare/profile.html#profTab=4&ID=050129&cmprID=050129&dist=25&loc=92404&lat=34.1814264&lng=-117.2323367&cmprDist=5.1&Distn=5.1>

Riegel, B., Dickson, V. V., & Faulkner, K. M. (2016). The situation specific theory of heart

failure self care: Revised and updated. *The Journal of Cardiovascular Nursing*, *31*, 226-235. <http://dx.doi.org/10.1097/JCN.0000000000000244>

Riegel, B., Lee, C., Dickson, V. V., & Carlson, B. (2009). An update on the self-care of heart

failure index. *Journal of Cardiovascular Nursing*, *24*, 485-497.

<http://dx.doi.org/10.1097/JCN.0b013e3181b4baa0>

Riegel, B., Moser, D. K., Anker, S. D., Appel, L. J., Dunbar, S. B., Grady, K. L., ... Whellan, D.

J. (2009). Promoting self-care in persons with heart failure: A scientific statement from

- the American Heart Association. Retrieved August 4, 2016, from <http://circ.ahajournalsorg/>
- Roncalli, J., Perez, L., Pathak, A., Spinazze, L., Mazon, S., Lairez, O., ... Galinier, M. (2009). Improvement of young and elderly patient's knowledge of heart failure after an educational session. *Clinical Medicine: Cardiology*, 3, 45-52.
- SCHFISpanish. (n.d). Retrieved from <http://www.self-careofheartfailureindex.com>
- Sales, V. L., Ashraf, M. S., Lella, L. K., Huang, J., Bhumireddy, G., Lefkowitz, L., ... Keitner, J. F. (2014). Utilization of trained volunteers decreases 30-day readmissions for heart failure. *Journal of Cardiac Failure*, 20, 377.e15-377.e23. <http://dx.doi.org/10.1016/j.cardfail.2014.04.008>
- Siabani, S., Driscoll, T., Davidson, P. M., & Leeder, S. R. (2016). Efficacy of a home-based educational strategy involving community health volunteers in improving self-care in patients with chronic heart failure in western Iran : A randomized controlled trial. *European Journal of Cardiovascular Nursing*, 15, 363-371. <http://dx.doi.org/10.1177/1474515115585651>
- Vedel, I., & Khanassov, V. (2015). Transitional care for patients with congestive heart failure: A systematic review and meta-analysis. *The Annals of Family Medicine*, 13, 562-571. <http://dx.doi.org/10.1370/afm.1844>.
- Vellone, E., Riegel, B., Cocchieri, A., Barbaranelli, C., Agostino, F. D., Antonetti, G., ... Alvaro, R. (2013, June 10). Psychometric testing of the self-care of heart failure index version 6.2. *Research in Nursing & Health*, 36, 500-511. <http://dx.doi.org/10.1002/nur.21554>
- Wakefield, B. J., Boren, S. A., Groves, P. S., & Conn, V. S. (2013). Heart failure care management programs A review of study interventions and meta-analysis of outcomes.

Journal of Cardiovascular Nursing, 28, 8-19.

<http://dx.doi.org/10.1097/JCN.0b013e318239f9e1>

Willey, R. M. (2012). Managing Heart Failure A critical Appraisal of the literature. *Journal of Cardiovascular Nursing*, 27, 403-417. <http://dx.doi.org/10.1097/JCN.0b013e31822ad3f3>

Yancy, C. W., Jessup, M., Bozkurt, B., Butler, J., Casey, D. E., Drazner, M. H., ... Wilkoff, B. L. (2013, October 14). 2013 ACCF/AHA guideline for the management of heart failure: A report of the American College of Cardiology Foundation/American Heart Association task force on practice guidelines. *Circulation*, 128, e240-e327.

<http://dx.doi.org/10.1161/CIR.0b013e31829e8776>

Zamanzadeh, V., Valizadeh, L., Howard, A. F., & Jamshidi, F. (2013, August 17). A supportive-educational intervention for heart failure patients in Iran: The effect on self-care behaviours. *Nursing Research and Practice*, 2013(), 1-7.

<http://dx.doi.org/10.1155/2013/492729>

Ziaeeian, B., & Fonarow, G. C. (2016). The prevention of hospital readmissions in heart failure. *Progress in Cardiovascular Diseases*, 58, 379-385.

<http://dx.doi.org/10.1016/j.pcad.2015.09004>

APPENDIX A

SELF-CARE OF HEART FAILURE INDEX*All answers are confidential.*

Think about how you have been feeling in the last month or since we last spoke as you complete these items.

SECTION A:

Listed below are common instructions given to persons with heart failure. How routinely do you do the following?

	Never or rarely	<i>Sometimes</i>	<i>Frequently</i>	<i>Always or daily</i>
1. Weigh yourself?	1	2	3	4
2. Check your ankles for swelling?	1	2	3	4
3. Try to avoid getting sick (e.g., flu shot, avoid ill people)?	1	2	3	4
4. Do some physical activity?	1	2	3	4
5. Keep doctor or nurse appointments?	1	2	3	4
6. Eat a low salt diet?	1	2	3	4
7. Exercise for 30 minutes?	1	2	3	4
8. Forget to take one of your medicines?	1	2	3	4
9. Ask for low salt items when eating out or visiting others?	1	2	3	4
10. Use a system (pill box, reminders) to help you remember your medicines?	1	2	3	4

SECTION B:

Many patients have symptoms due to their heart failure. Trouble breathing and ankle swelling are common symptoms of heart failure.

In the past month, have you had trouble breathing or ankle swelling? Circle one.

- 0) No
- 1) Yes

11. If you had trouble breathing or ankle swelling in the past month...

(circle **one** number)

	Have not had these	I did not recognize it	Not Quickly	Somewhat Quickly	Quickly	Very Quickly
How quickly did you recognize it as a symptom of heart failure?	N/A	0	1	2	3	4

Listed below are remedies that people with heart failure use. If you have trouble breathing or ankle swelling, how likely are you to try one of these remedies?

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

	Not Likely	Somewhat Likely	Likely	Very Likely
12. Reduce the salt in your diet	1	2	3	4
13. Reduce your fluid intake	1	2	3	4
14. Take an extra water pill	1	2	3	4
15. Call your doctor or nurse for guidance	1	2	3	4

16. Think of a remedy you tried the last time you had trouble breathing or ankle swelling,

(circle **one** number)

	I did not try anything	Not Sure	Somewhat Sure	Sure	Very Sure
How <u>sure</u> were you that the remedy helped or did not help?	0	1	2	3	4

SECTION C:

In general, how confident are you that you can:

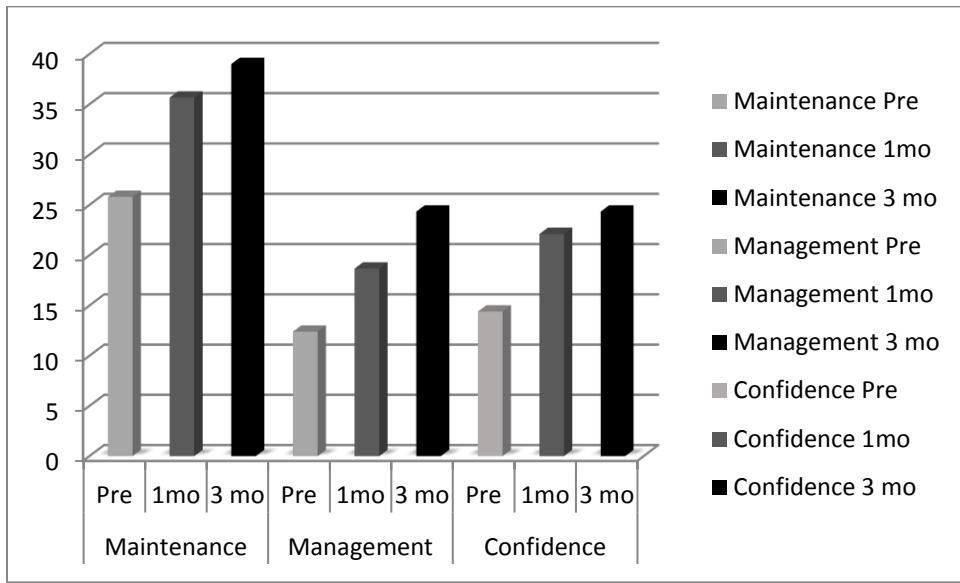
	Not Confident	Somewhat Confident	Very Confident	Extremely Confident
17. Keep yourself <u>free of heart failure symptoms?</u>	1	2	3	4
18. <u>Follow the treatment advice</u> you have been given?	1	2	3	4
19. <u>Evaluate the importance</u> of your	1	2	3	4

symptoms?				
20. <u>Recognize changes</u> in your health if they occur?	1	2	3	4
21. <u>Do something</u> that will relieve your symptoms?	1	2	3	4
22. <u>Evaluate</u> how well a remedy works?	1	2	3	4

APPENDIX B

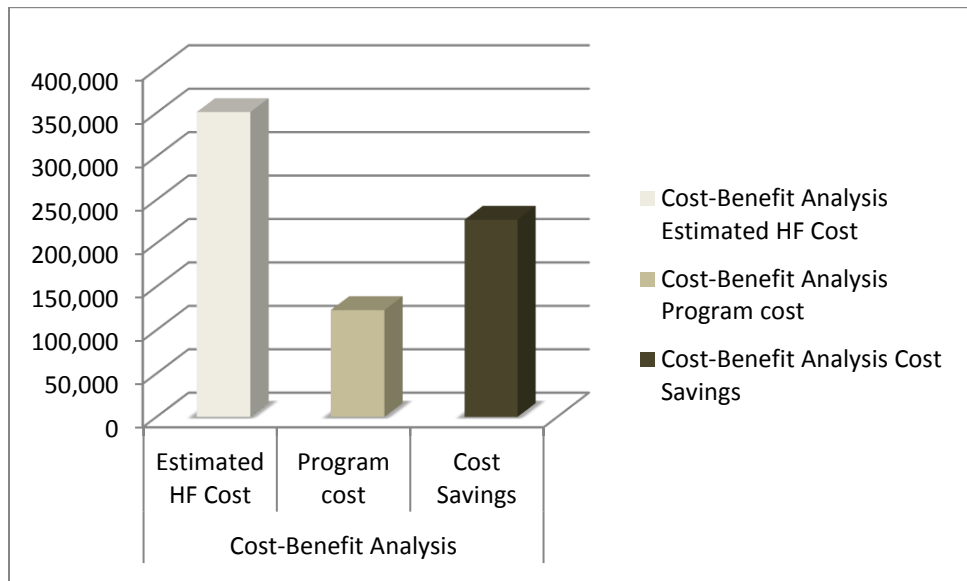
Self-Care of Heart Failure Index (SCHFI) Scores Before & After

Heart Failure Self-Care Management Program



APPENDIX C

Cost-Benefit Analysis



Total Estimated Costs for evidence based project Versus Hospitalization in Congestive Heart Failure Patients

For an APRN (a full time employee) in the cardiology clinic, yearly costs	\$120,000
Educational materials	\$ 600
Miscellaneous costs	\$3000
Estimated yearly total expenditure for the project	\$123,600

Number of 30-day readmissions in last 12 months	27
Cost of heart failure per Medicare readmission	\$13,000
Estimated cost of 30-day readmissions in last 12 months	27 x \$13000
Estimated yearly expenditure from 30-day readmissions	\$ 351,000
Estimated cost savings to the hospital for one year (if zero readmissions)	= \$ 351,000 - \$123,600 = \$227,400

Calculation of Estimated Hospital Cost Avoidance Resulting From this evidence-based program

Number of patients completed one month in the project	9
Number of patients readmitted	0
Cost of heart failure per Medicare readmission	\$13,000
Estimated cost savings on this evidence based project on 9 patients	\$13,000x 9 = \$ 117,000