Transitional Care Interventions to Reduce Readmission in Patients with Heart Failure

Beulah Joshua

University of Missouri–Kansas City

Abstract

Heart failure affects millions of people in the United States and serves as a significant economic burden on the health care system. The chronic nature of illness serves as a challenge for heart failure patients to manage their symptoms, resulting in hospitalization and readmission. The purpose of the project is to assess the effects of transitional care interventions in reducing readmission among heart failure patients. The inquiry will focus on individualized patient education using teach-back method and telephone follow-up in the transitional care interventions to enhance the self-care abilities and reduce readmissions in patients with heart failure. A quasi-experimental, one group, pre-test, and post-test design with a sample of 40 patients received the transitional care interventions at a cardiology outpatient setting. The self-care of heart failure index version 6.2 was used to measure self-care ability and reduce readmission in six-months. The project results support the evidence that transitional care interventions aid in reducing heart failure related readmission. The heart failure readmission rate for the participants in the project was reduced by 5% at the end of six-months. Reducing heart failure-related readmission by improving self-care ability promotes quality of life, enhances satisfaction, and reduces health care cost.

Keywords: heart failure, readmission, patient education, transitional care, self-care management

Transitional Care Interventions to Reduce Readmission in Patients with Heart Failure

Heart failure serves as a leading cause of readmission and hospitalization and a significant burden on our healthcare system (Ziaeian & Fonarow, 2016). In the United States, approximately 5.7 million adults have heart failure, and the prevalence is expected to increase by 46% in 2030 (Ziaeian & Fonarow, 2016). The health care expenditure related to the care of patients with heart failure is $32 billion per year (Hawkins et al., 2016). Measures to prevent readmission gain the special attention of the researchers and policymakers as it serves as a benchmark for the quality of care and reduction of unnecessary medical expenditure (Ziaeian & Fonarow, 2016).

Significance

Nearly 25% of patients with heart failure are admitted within thirty days of discharge, and 50% of patients are readmitted within the first six months (Vedel & Khanassov, 2015). In the United States, approximately 550,000 new cases of heart failure are diagnosed each year (Dunlay & Roger, 2014). The majority of health care expenditure is related to readmissions, and as a result of legislation policies, health care institutions with higher 30-day readmission rates for certain conditions, including heart failure face the burden of penalties and reduction in Medicare reimbursement (Smith et al., 2018).

Heart failure readmission and hospitalization is mainly due to non-adherence to medication plan, lack of understanding regarding the treatment plan, lack of continuity of care, lack of awareness of heart failure symptoms, and lack of coordination of care between patient and providers (Vedel & Khanassov, 2015). Transitional care interventions focusing on patient education on self-management, regular follow up, and coordination of care among providers aid in reducing preventable hospitalization and readmission (Vedel & Khanassov, 2015). In a systematic review, transitional care intervention reduced the emergency department visits by 29% and readmission rate by 8% (Vedel & Khanassov, 2015).

Local Issue

In Missouri, the penalties for excess readmission for the fiscal year 2015 were 12.2 million dollars (M., Rowden & Wheeler, 2015). In Missouri, the mortality rate related to heart failure accounts for 186.2 per 100,000 population and hospitalizations comprise 37.3 per 1000 Medicare beneficiaries in 2016 (Centers for Disease Control and Prevention, 2019). Heart failure serves as the fifth leading cause of hospitalization (Poffo et al., 2017). At the project site, the current heart failure readmission rate is 35%. The comorbidities associated with heart failure such as high blood pressure, diabetes, impaired renal function, and lung disease worsen the prognosis resulting in readmission (Poffo et al., 2017). Ongoing patient education and support play a vital role in heart failure patients ability to manage their symptoms effectively and reduce readmission (Simmonds et al., 2015).

Diversity Considerations

In St. Joseph City, Missouri with a population of 76,800 people there are 82.2% Caucasian, 7.08% Hispanic or Latino residents, 6.2% African Americans and 1.07% Asian (Census Bureau ACS, 2017). Racial disparities exists related to heart failure, as African Americans have 68% risk of heart failure compared to 49% among Caucasians, and risk of heart failure is due to modifiable risk factors such as high blood pressure, smoking, elevated glucose level, and heart disease (Benjamin et al., 2019). In St. Joseph City, Missouri, nearly 18.8% of people live below the poverty line (Census Bureau ACS, 2017). Readmission is highly influenced by patient socio-economic status, access to high-quality health care, community services, and post- discharge support (M., Rowden & Wheeler, 2015). In Missouri, there is a strong relationship between the socioeconomic status and patient risk of readmission, and in 2013, patients with 30% or more poverty rate had a 19.6% heart failure readmission rate (M., Rowden & Wheeler, 2015).

Problem Statement

Patients with heart failure are at increased risk for hospitalization and readmission due to the chronic nature of the disease with a poor prognosis. Lack of adherence to treatment plans leads to unnecessary hospitalization and readmission. Applying transitional care interventions to reduce the rate of readmission and unnecessary hospitalization is crucial to enhance patient outcome and well-being. The student investigator will apply patient education, and telephone follow-up as part of transitional care intervention to promote the effective self- management of heart failure symptoms and reduce readmission (Appendix A).

Intended Improvement with Purpose

The purpose of the proposed evidence-based project was to determine if transitional care interventions reduce the readmission rate among patients with heart failure in an outpatient setting. Heart failure patient education using the teach-back method and telephone support to reinforce self-care management was implemented to enhance self-care management skills and reduce heart failure related readmission. Literature supports the need for ongoing education and coordination of care to reduce unnecessary hospitalization and readmissions. The primary intended improvement as a result of transitional care intervention was to enhance the self-care management skills and reduce the heart failure readmission rate of patients with heart failure. The secondary purpose, in the future is to reduce emergency room visits, hospitalization, and readmission rate to promote heart failure patient's well-being and outcome (Appendix B).

Facilitators and Barriers

Major facilitators for the project were the organization's chief executive officer, cardiovascular office providers, care manager for the cardiology outpatient clinic, lead registered nurse, and clinic staff. The cardiovascular office space was also beneficial to the student investigator who utilized the office space with no additional cost to provide transitional care

interventions. The barriers were the patient's willingness to actively participate in the project, patient educational level, managing constraints with the clinic time, coordination of patient care activities in the outpatient clinic and limited project timeline. The economic component required for the project served as a facilitator to implement the evidence-based project intervention. The cost related to the project was minimal and included only the cost of printing materials required for pre and posttest and patient education brochures.

Inquiry

In adult patients with heart failure, does transitional care interventions after discharge compared to routine office visits after discharge contribute to patients effective self-management of heart failure symptoms and reduce readmission within six-months in an outpatient setting?

Literature Search Strategies

The literature search focused on evidence in relation to transitional care interventions to reduce readmission among heart failure patients with high-level evidence given priority. The databases included Medline, PubMed, ProQuest, Ovid, CINAHL, and Cochrane Database of Systematic Reviews (CDSR). EndNote, Mendeley, and Google Scholar search engine were accessed for national guidelines related to transitional care intervention and self-management of heart failure. The search strategy was limited to studies in the last ten years and available in English. Key terms used included heart failure, readmission, care coordination, transitional care, and heart failure self-management. Non-English articles, studies in a population less than 18 years, and chronic conditions other than heart failure were excluded.

A total of 34 research studies were included after considering the inclusion and exclusion criteria. Based on Melnyk and Fineout-Overholt's (2019) hierarchy of level of evidence, four studies were systematic review of level one evidence, eleven quantitative studies with level II evidence, five quantitative quasi-experimental studies with level III evidence, four quantitative non

experimental studies with level IV evidence, one qualitative systematic review with level V evidence, two quantitative retrospective studies with level VI evidence, five qualitative ethnographic studies with level VI evidence and two practice guidelines with level I evidence. (Appendix C).

Synthesis of Evidence

Patients with heart failure are at increased risk for hospitalization and readmission due to the chronic nature of the disease and a poor prognosis. The fundamental objective is to analyze the effect of transitional care interventions in reducing readmission among patients with heart failure. The following themes, identified from the literature review, focus on transitional care necessary to reduce readmission rate of patientswith heart faliure: nurse-managed transitional care, care coordination, quality of life, cost-effectiveness, and bundled transitional care intervention. Research studies support incorporating more than one transitional care intervention.

Nurse-managed Transitional Care

Seven research studies supported nurse-managed transitional care. Nurse- managed multidisciplinary heart failure contributes to enhanced quality of life and reduced readmission among heart failure patients (Morrison, Palumbo, & Rambur, 2016; Sezgin, Mert, Özpelit, & Akdeniz, 2017; J. Smith, Pan, & Novelli, 2016). The transitional care interventions provided by nurses aim to optimize continuity of patient care and enhance the outcomes of patients with heart failure (Masterson Creber et al., 2016; Sezgin et al., 2017; Yu et al., 2015). Research studies stress the importance of specialized cardiac nurse to provide heart failure education and follow-up, which serves as a valuable tool to enhance patient adherence to treatment plans and reduces unnecessary hospitalization and readmission (Masterson Creber et al., 2016; Sezgin et al., 2017; Yu et al., 2015). Providing individualized nurse-led education promotes patients self-care knowledge and confidence in managing symptoms and improves the health-related quality of life (Masterson Creber et al., 2016; Sezgin et al., 2017; Yu et al., 2015). The availability of a discharge nurse to provide succinct discharge instructions and follow-up plans assists patients with heart failure in understanding the importance of medication adherence and lifestyle changes that impact symptoms at home, reducing the risk of readmission and emergency room visit (Comin-Colet et al., 2014; Jack et al., 2009; Morrison et al., 2016; J. Smith et al., 2016b). Interventions provided by nurses not only reduce readmission rates among heart failure patients but also reduces health care utilization, health care cost, as well as improves health care quality (Comin-Colet et al., 2014; Jack et al., 2009; Sezgin et al., 2017).

Care Coordination

The care coordination is supported by eight research studies. Care coordination programs focus on reducing the fragmentation of care and streamlining the post hospital discharge process (Low et al., 2015; Shaw et al., 2014; Simmonds et al., 2015). The patient's awareness about the

warning signs and symptoms of heart failure, the importance of monitoring weight, sodium and fluid restrictions and telephone access for ongoing support are critical to health maintenance (Jackson et al., 2013; Park, Branch, Bulat, Vyas, & Roever, 2013; Shaw et al., 2014). A continuous caring relationship with a patient-centered approach along with coordination by integrating the patient's care services and information reduces the rate of hospital admission and emergency room visits (Park et al., 2013; Sanders et al., 2015; Simmonds et al., 2015). Research identifies patient barriers in seeking help related to heart failure symptoms and includes fear of hospitalization, uncertainty about management of symptoms, lack of adherence to the treatment plan, and unable to identify the correct person to contact to manage their disease condition effectively (Jackson et al., 2013; Sanders et al., 2015; Simmonds et al., 2015).

Empowering patients by educating them on management of their heart failure symptoms enhances adherence to medication and lifestyle interventions, which reduces emergency department visits and hospitalizations, and improves patient satisfaction and quality of health care (Lim et al., 2016; Park et al., 2013; Schipper et al., 2016). Ongoing heart failure education and coordination of care play a vital role in reducing the fragmentation of care and early detection of worsening signs and symptoms to prevent unnecessary hospitalization and readmission (Schipper et al., 2016; Shaw et al., 2014; Simmonds et al., 2015).

Quality of Life

Seven research studies addressed quality of life. Ongoing patient education and follow-up, play an essential role in early identification and management of heart failure symptoms and reduce readmission (Barnason, Zimmerman, Hertzog, & Schulz, 2010; Boyde et al., 2018; Travis et al., 2012). In patients with heart failure, chronic symptoms such as fatigue and shortness of breath, with exertion and at rest, lead to limitations of activities at home and at the workplace, resulting in functional impairment (Barnason et al., 2010; Boyde et al., 2018; Travis et al., 2012). Moreover, it

leads to financial burden as a result of frequent readmission and psychological distress which affects the quality of life of patients with heart failure (Barnason et al., 2010; Sezgin et al., 2017; Travis et al., 2012). The evidence supports that patients with heart failure have trouble understanding the complex management of their condition and fail to adhere to the appropriate management resulting in the adverse patient outcome (Boyde et al., 2018; Kalter-Leibovici et al., 2017; Sezgin et al., 2017; Travis et al., 2012). Self-care management education programs for heart failure patients improves quality of life and reduces patient suffering (Abbasi, Najafi Ghezeljeh, & Ashghali Farahani, 2018; Sokoreli et al., 2019; Srisuk, Cameron, Ski, & Thompson, 2017). Research findings support the role of self- management education programs in enhancing patient's knowledge related to their long-term health care needs and improvement of health status, self-efficacy, and quality of life (Abbasi et al., 2018; Boyde et al., 2018; Travis et al., 2012).

Cost-effectiveness

Cost-effectiveness is supported by six research studies. Reducing readmission among heart failure patients reduces health care cost and enhances health care quality (Ahmad et al., 2018; Bryant-Lukosius et al., 2015; Stauffer et al., 2011). Incorporating heart failure management programs with home-based intervention, nurse-led discharge education, and structured telephone support during the patient's transition to the home setting following hospital discharge serve as a cost-effective measure to reduce readmission of patients with heart failure (Sahlen et al., 2016; Scuffham et al., 2017; Stauffer et al., 2011). High-intensity transitional care intervention for patients with a chronic conditions such as heart failure improve overall health status and health quality of patients following discharge and significantly reduce the health care cost (Bryant-Lukosius et al., 2015; Naylor et al., 2011; Stauffer et al., 2011).

In a quasi-experimental study, the transitional care model reduced the health care cost by $439 per month for one member at three months and provided a cumulative savings of $2170 per

person at 12 months (Naylor et al., 2011). The continuity of care provided by transitional care interventions offers advanced knowledge and necessary skills to manage the complex health care needs of heart failure and reduce the frequent utilization of emergency department visits and unnecessary hospitalizations to improve health and quality of life (Naylor et al., 2011; Sahlen et al., 2016; Stauffer et al., 2011). It provides an opportunity for patients to actively participate in their care, take control of their health situation, and prevent adverse health outcomes resulting in unnecessary medical bills (Bryant-Lukosius et al., 2015; Naylor et al., 2011; Sahlen et al., 2016).

Bundled Transitional Care Intervention

Bundled transitional care intervention was supported by seven research studies. High intensity bundled transitional care interventions play a significant role in meeting the patient's chronic health care needs and preventing unnecessary hospitalization and readmission (Feltner et al., 2014; Guirguis-Blake, 2016; Van Spall et al., 2017; Vedel & Khanassov, 2015). The teach-back patient education method to enhance patients understanding related to their medication management, fluid restriction, dietary changes, monitoring daily weight and warning signs of heart failure provide patients with the confidence to manage their disease condition (Bradley et al., 2013; Feltner et al., 2014). When an additional intervention, such as nurse home visit or structured telephone support is combined, it serves as a high-intensity transitional care intervention to reduce readmission among heart failure patients (Bradley et al., 2013; Retrum et al., 2013; Young, Kupzyk, & Barnason, 2017). Bundled transitional care interventions reduce health care cost and improve the heart failure patient's quality of life by reducing unnecessary health care utilization (Bradley et al., 2013; Feltner et al., 2014; Guirguis-Blake, 2016).

Research supports the implementation of high-intensity transitional care interventions for a longer duration of six to 12 month following discharge, depending on the patient's risk factors and the severity of the stage of heart failure to reduce readmission effectively (Bradley et al., 2013;

Guirguis-Blake, 2016; Van Spall et al., 2017; Vedel & Khanassov, 2015). Factors related to heart failure patient's readmission include the progressive chronic nature of illness, lack of support, psychological factors, self-care management, and resources (Bradley et al., 2013; Comín-Colet et al., 2016; Retrum et al., 2013; Vedel & Khanassov, 2015). Bundled interventions play a major role in promoting continuity of care and ongoing support to reduce the existing barriers and provide patient-centered interventions to reduce readmission and enhance a patient's quality of life (Feltner et al., 2014; Retrum et al., 2013; Van Spall et al., 2017; Vedel & Khanassov, 2015; Appendix D)

Theory

The theoretical framework that best describes the transitional care process is the transition theory model (Smith & Liehr, 2018). The concepts of transition theory include types and patterns of transition, properties of transition experience, a transition condition, patterns of response, and nursing therapeutics. Transition theory is a middle range theory by Meleis, which guides to enable patients to cope effectively to meet the transitional demands of care at home after discharge (Meleis, 2010). Nursing therapeutics refers to the therapeutic transitional care interventions that enable patients an effective transition to care at home and nursing therapeutics serves as a significant resource to reduce readmission in patients with heart failure (Meleis, 2010). The transition experience includes the patient's awareness, engagement, level of comfort, and mastering related to the disease process (Smith & Liehr, 2018). Healthy transition reflect the skills and behavior necessary to cope with changes in the disease condition and health status (Smith & Liehr, 2018). Evidence-based interventions with multiple transition components are essential to enhance patient outcome (Kripalani, Theobald, Anctil, & Vasilevskis, 2014).

Theory Application in Similar Studies

Transition serves as a central concept in nursing practice (McEwen & Wills, 2014). According to McEwen and Wills (2014), changes in health and illness influence the patient's ability

to care for themselves, and healthy transition is a result of effective coping strategies. Transition serves as a vital concept in the nursing phenomenon, and transition theory is applied worldwide to promote the effective transition of individuals (Alligood, 2018). Transition theory serves as a parent theory for situation-specific theories and various research studies (Alligood, 2018). Transition theory is empirically tested and support the framework for understanding transition experience among a diverse population (Alligood, 2018). Patients with heart failure face uncertainty related to deteriorating functional status of a chronic condition (Davidson, Dracup, Phillips, Padilla, & Daly, 2007). Successful transition promotes well-being, adaptation, role mastery, and functional ability to manage heart failure symptoms and reduce readmission (Appendix E).

Methods

Institutional Review Board

The student investigator implemented the evidence-based project at St. Joseph city, Missouri. As this project involved transitional interventions to reduce heart failure patient's readmission by providing patient education with the teach-back method and telephone follow-upto improve care, minimal risk was associated with the project. Therefore, the project was determined to be exempt research. The organization institutional review board (IRB) approval was obtained to implement the project (Appendix F).

Ethical Issues

Voluntary informed consent was obtained to participate in the evidence-based project. The participants were provided information about the benefits and risk of participating in the heart failure educational intervention to promote self-care management and reduce readmission. The participant's questions and concerns were clarified, and they were notified of their rights to withdraw from the project at anytime. The student investigator contact information was provided

so the patient could call for any concerns or issues related to their participation in the project. The period of the intervention and nature of participants commitment were explained clearly to maximize benefit and prevent confusion. Confidentiality of the participants and records was maintained by assigning codes and keeping the records in a locked cabinet. Measures were taken to prevent violation of ethical principles in research. The student investigator contributed to the minimum funding required to implement the project in the outpatient setting. There were no investigator research conflicts associated with implementing the evidence-based project to reduce heart failure patient's readmission with transitional care intervention. (Appendix G)

Funding

The minimal cost was covered with the student investigator's personal fund. The cardiovascular consultant's office space was utilized at no additional cost to provide transitional care intervention. The follow-up phone calls were made using phone services available in the facility. The heart failure education brochure for the participants costs $28. The printing cost for the questionnaire was $52 and an additional stationary cost was $25. The estimated total project cost was $105 (Appendix H).

Setting and Participants

The cardiovascular outpatient clinic in St. Joseph City served as the setting to implement transitional care interventions to reduce heart failure patient's readmission. The participants were adult heart failure patients with a history of heart failure admission in the last six months. The inclusion criteria for the participants were a primary diagnosis of heart failure, able to read and understand English, above age 18 years, history of at least one heart failure related admission, and telephone access. The exclusion criteria included patients with end-stage heart failure unable to participate actively in self-care, patients on palliative care, inability to read and speak English, less

than 18 years of age, and lack of telephone access. A convenience sampling method was applied to recruit 40 participants with heart failure.

Evidence-based Intervention

The initial step in implementing the evidence-based intervention was obtaining institutional review board approval to proceed with the transitional care intervention project. The student investigator also met with the clinic lead nurse, case managers, and providers at the cardiovascular clinic to gain support and smoothly implement the process. The eligible participants discharged with a diagnosis of heart failure in the last six months were identified by incorporating the patient access representative and office staff to avoid unnecessary access into patient information and maintain the privacy and confidentiality of the patients visiting the clinic. The heart failure patients meeting eligibility criteria were approached by the project investigator who explained the purpose and outcome of transitional care intervention in reducing heart failure readmission. Interested participants provided voluntary consent to take an active role in self-management of heart failure as part of transitional care intervention.

On the initial visit, a pretest using the heart failure self-care index questionnaire was performed to assess the basic knowledge of the participants related to heart failure self-care management. Based on the pretest score, the participant's lack of knowledge was assessed, and the student investigator provided individualized face to face patient education using a teach-back method. The education session lasted for 15 to 20 minutes highlighting the importance of fluid and diet restriction, weight management, warning signs of heart failure exacerbation, medication adherence, and measures to prevent unnecessary hospitalization applying the American Heart Association patient education information for heart failure . Confidentiality of the participant's information was maintained by proper handling of patient information and storing data in secure-locked cabinets. A follow-up telephone call was made once in four weeks to reinforce heart failure

self-care management. The participant's questions and concerns were clarified, and expert opinion was obtained from the cardiology clinic providers as needed. The participant's data related to readmission, and the emergency room visits were obtained from medical records, and the participants report. At the end of the six months follow- up, the participants took a posttest, and the results were compared to determine the improvement in the participants self-care management and reduction in heart failure readmission rate as a result of transitional care intervention (see Appendix I intervention flow diagram; Appendix J project timeline; Appendix K interventional material). Literature supports that measures to improve patient literacy and self-care management serve as a significant factor in preventing unnecessary hospital admission (Luke, 2015).

Change process Model

Kurt Lewin's model of change served as a cornerstone for understanding and effectively dealing with the change process (Cummings, Bridgman, & Brown, 2016). There are three stages of change in Lewin's framework: unfreeze, change, and refreeze (Cummings et al., 2016). The unfreezing involves creating the motivation to change (Cummings et al., 2016). The unfreezing stage was initiated by communicating with the participants, identifying the problem, and helping the heart failure patients to recognize the need for change to manage their heart failure symptoms effectively. The second stage described as change involves the process of transition and commitment to learning new concepts (Cummings et al., 2016). It addresses the process of developing an action plan to implement the change. Teach-back patient education intervention on heart failure self-management enabled identification of the patient's skills necessary to create the participant's active involvement in heart failure self-management and strategies to prevent readmission. The final stage of refreezing involves integration and consolidation in institutionalizing the new concepts (Cummings et al., 2016). The telephone follow-up enabled to reinforce the participants self-care management of heart failure and support the participants in

applying the new knowledge and measures to reduce unnecessary emergency room visits and rehospitalization.

Evidence-based Practice Framework

The Model for Evidence-Based Practice Change, served as the framework for this project. It is a revised version of the model for change to evidence-based practice by Rosswurm and Larrabee (Melnyk & Fineout-Overholt, 2019). The Model for Evidence-Based Practice Change has six steps: assess the need for change, link problem with interventions and outcomes, synthesize the best evidence, design a change in practice, implement and evaluate the practice change, and integrate and maintain change in practice (Practice, Rosswurm, & Larrabee, 1999). This model provides clear, self-explanatory steps in implementing evidence-based practice in a clinical setting. The evidence-based project applied the model of evidence-based practice framework to implement teach-back patient education and telephone follow-up to reinforce heart failure self- management.

Study Design

The project design was quasi-experimental. The study involved one group which served as an intervention group, and there was no control group. A pretest and posttest design was used to assess the participants self-management skills to manage heart failure symptoms effectively and reduce readmission. The self-management and reduction in readmission rate were assessed as the outcome measures.

Internal Validity

Effective planning reduces the major threats to the internal validity of the evidence-based project. The student investigator took measures to plan the process appropriately to enhance the patient outcome with the proposed evidence-based transitional care intervention. The study participants were asked to participate voluntarily which might decrease attrition or withdrawal from the project. The benefits and outcomes of the transitional care interventions were explained to

the participants, and all the questions and concerns were clarified to promote adherence to the study. The participants completed a pretest to assess their baseline knowledge related to effective self-care management of heart failure. The transitional care intervention includes an individualized face to face patient education with the teach-back method to assess the participants level of understanding. A telephone follow-up was made once a month to reinforce the information regarding self-care management. The project investigator took measures, to not over enhance the participant's performance in the posttest with repetition of information related to the self-care of heart failure index questionnaire. A post-test was administered at the end of six months to assess the patient's improvement in self-care management of heart failure symptoms effectively. As the intervention period is limited to six months' time the possibility of a threat to maturation was negligible.

External Validity

The evidence-based project intervention was conducted in a single outpatient cardiologist clinic at St. Joseph city. The generalization of the project results was limited due to the lack of inclusion of participants from different geographical locations and settings. As the convenience sample size was small, it may not represent the target population. The study was conducted among participants with a diagnosis of heart failure; hence the study results can be transferred to benefit patients with a similar condition in a different primary care setting or outpatient clinic. It will benefit patients with heart failure in management of their symptoms effectively and reduce readmission.

Outcomes Measured

The primary outcome of the evidence-based transitional care intervention was to reduce the readmission of patients with heart failure. The focus of the intervention was to enhance participants knowledge regarding effective self-care management of heart failure symptoms at home. Effective

transition reduces rehospitalization, decrease adverse events, and enhances patient outcome and satisfaction (Albert et al., 2015). The secondary outcome to be measured later includes heart failure related hospitalization, emergency room visit, and readmission.

Measurement Instrument

Heart failure is a chronic condition with poor prognosis and self-care plays a significant role in improving heart failure patient's outcome (Riegel, Lee, Dickson, & Carlson, 2009). The Self-Care of Heart Failure Index (SCHFI) questionnaire was used to measure the participants self-care abilities to manage their heart failure symptoms effectively. The SCHFI consists of three subscales with a total of 22 items with a four-point response scale for the rating (Riegel et al., 2009). The SCHFI aids in measuring patient's self-care maintenance, self-care management, and self-care confidence in a focused, quick manner (Riegel et al., 2009). Each subscale provides a total score of 100 and a higher-level score indicates enhanced self-care ability (Riegel et al., 2009). A minimum score of at least 70 or above is necessary to reflect the basic level of self-care adequacy (Riegel et al., 2009). The SCHFI is in the public domain and permission was not required to use the tool for measurement (Riegel et al., 2009). The reliability of the SCHFI is indicated by a Cronbach's alpha .76, and the construct validity is satisfactory with $p<.05$ (Riegel et al., 2009). The reliability and validity of the SCHFI are significant to support the measurement of results in clinical practice (Riegel et al., 2009). The patients completed a pre-test to assess their basic knowledge, and at the end of the six-month follow-up, a post-test was performed using the same instrument to assess the patient's improvement in self-care management. The participant's rate of readmission within the healthcare system was measured by using electronic data. The participants self-report was used to obtain information regarding admission in other health care facilities during the six-months (Appendix L).

Quality of data

The confidentiality of the participants was maintained by assigning codes and storing the documents in locked cabinets. The participant's voluntary consent was obtained to maintain ethics, reduce attrition, and enhance active participation in the intervention. The patient's exam room in the cardiology office was used to administer the SCHFI questionnaire, and privacy was provided to complete the test. The investigator avoided giving clues to provoke the choice of the answer in the questionnaire to enhance obtaining accurate information pre and post-intervention. A priori power analysis for a sample of 40 participants was calculated. The power achieved was 0.99 with an effect size of 0.8, an alpha value of 0.05, and a paired t-test (Appendix M). Research studies related to the transitional care intervention significantly support the reduction in fragmentation of patient care and reduction of heart failure readmission which serves as a benchmark to support the intervention (Albert et al., 2015; Sanders et al., 2015; Smith, Pan, & Novelli, 2016; Vedel & Khanassov, 2015; Appendix N)

Analysis Plan

The demographic data of the participant, including age, gender, ethnicity, and education level, were collected for baseline information at the beginning of the study. The Statistical Package for the Social Sciences (SPSS) version 26 was used for statistical analysis of the data. Descriptive statistics were used to analyze the demographic data of the participants. Inferential statistics were used to evaluate the impact of the intervention and draw a conclusion. A paired t-test was used to analyze the intervention effect and readmission among patients with heart failure.

Results

Setting and Participants

The project was conducted at St. Joseph city, cardiovascular outpatient clinic setting after obtaining IRB approval. The participants involved in the project were voluntary participants with a diagnosis of heart failure who were discharged from the hospital within 30-days with a history of

heart failure admission. Forty participants were recruited from August 2019 to the first week of September 2019. The participants were 18 years or older, and one of the participants was nearly 96-year-old. The majority of the participants were Caucasian.

Intervention Course

The transitional care interventions to reduce heart failure readmission implemented for the project inquiry included patient education related to heart failure self-care management and telephone follow-up once a month for six-months. The initial intervention started with recruiting voluntary participants with informed consent to participate in the project. A face to face discussion and education was provided in the clinic during the initial encounter on the recruitment of eligible participants. Telephone follow-up calls were made once a month to the participants and reinforce self-care management related to heart failure management. At the end of follow-up in February 2020, a posttest was conducted using the Self-Care Heart Failure Index questionnaire. The initial 40 participants recruited for the project were able to continue until the end of the project period. The telephone follow-up, although it was challenging at times, served as a significant resource to stay in touch and follow-up regularly. The post-survey was completed during the scheduled six-month follow-up in the clinic with the help of clinic staff, and a few participants were contacted over the phone to complete the survey. The heart failure-related readmission rate was analyzed using medical records in the facility, and self-report from participants was gathered regarding any history of heart failure-related readmission in any medical facility. The data entry and statistical analysis were completed by March 2020 (Appendix O).

Outcome Data by Subtopic

The findings supported the positive impact of transitional care interventions on self-care management skills of heart failure participants (Appendix P). Out of the 40 participants, the SCHFI score was significantly improved at the end of the six months. The majority of the participants were

able to adhere to the treatment plan and reduce unnecessary hospitalization and heart failure readmission. The telephone follow-up enabled communication to clarify concerns promptly and served as a leading resource to support 100% data collection, and there was no missing data related to the project.

Heart Failure Readmission

Transitional care interventions enabled the participants to manage their heart failure symptoms effectively. It is reflected in the statistical analysis, as 95% of the participants did not have any heart failure-related readmission. At the end of six months follow-up, two participants had one episode of admission in the hospital for heart failure. As a result, 5% of the participants experienced readmissions related to heart failure (Appendix Q). Nearly seven participants (17.5%) were admitted to the hospital with an etiology of either chest pain, chronic obstructive pulmonary disease, fall, and pneumonia not related to heart failure (Appendix Q).

Heart Failure Self-Care Management

The participants' ability to manage their heart failure symptoms effectively was reflected in the posttest SCHFI score (Appendix P). The posttest SCHFI mean score was 77.38, and the pretest SCHFI mean score was 61.13 ($p<.001$, 95% CI).

Treatment Adherence

Heart failure self-care management plays a vital role in reducing heart failure readmission. The participant's ability to monitor their weight, salt intake, exercise, medication adherence, and ability to recognize early symptoms of heart failure is crucial to avoid unnecessary hospitalization. The project results supported the improvement in patient adherence to the treatment plan, changes to lifestyle behavior, and the ability to recognize and intervene in the heart failure symptoms effectively at home and reduce readmission. (Appendix R)

Discussion

Success, Most Important

The success of the project includes the patient's participation in supporting the interventions. The telephone follow-up and patient education using the teach-back method regarding heart failure self-care management served as an effective tool to reduce heart failure-related readmission. The forty participants stayed motivated and completed the project successfully.

Study Strengths

The project setting was an outpatient cardiovascular clinic, and it served as a significant resource in recruiting the 40 participants for the project. The physicians and staff in the clinic were a in finding the eligible participants and motivating them to participate by reinforcing the benefits of self-care management related to heart failure management. The clinic time for the student investigator to interact with the participants was organized to accommodate the patient during the physician visit and reduce the extra waiting. The clinic staff was friendly, and the computer system was utilized to collect the participant's data promptly. The telephone follow-up enabled the student investigator to reach out to the participants once a month regularly and implement the interventions successfully.

Results Compared to Evidence in the Literature

Transitional care interventions for heart failure patients promote continuity of care, enhance self-care management skills, and reduce heart failure-related readmission rate. It is supported by literature evidence as cost-effective interventions to benefit patients with heart failure (Blum et al., 2020; Duff-Brown, 2020). Structured telephone support for three months, supports the benefit of improving self-care management, medication adherence, and self-care confidence among heart failure patients (Johansson & Athilingam, 2020). Heart failure self-care education and telephone

support reduces the health care cost, improves quality of life, and reduces readmission (M. L. Shaw, 2020). The study supports the evidence that as a result of transitional care interventions in four-months, the hospital readmission rate reduced to 10 readmissions per 100 patients (M. L. Shaw, 2020). Early follow-up of heart failure patients with telephone calls significantly improve the overall quality of life and reduce the readmission rate of patients with heart failure (American Heart Association, 2018).

In high-risk patients, initiating patient-education, and telephone follow-up within 72-hours of discharge from the hospital significantly reduced the readmission rate within 30-days of discharge (Miller & Schaper, 2015). The cost savings related to transitional care interventions in reducing heart failure readmission is nearly $19,750 per quality life-year gained (Horwitz, 2020). Structured telephone support and heart failure self-care management education for 18-months demonstrated improvement in patient's ability to learn heart failure symptoms management, and reduce hospitalization and mortality rates among heart failure patients (Johansson & Athilingam, 2020).

Limitations

Internal Validity Effects

The intervention period was six months, and the participants were recruited with voluntary consent. Hence, it reduced the effect of maturation and attrition of the participants. The telephone follow-up was done once a month to reinforce self-care management related to heart failure. The pretest and posttest were conducted using the same SCHFI questionnaire. There is a minimal risk of enhancing posttest scores as the participants are familiar with the questionnaire.

External Validity Effects

The project was conducted in a single outpatient setting. The majority of the participants were Caucasian. A convenience sampling method was used to recruit participants. Therefore,

generalization of the study is limited. As it focusses on patients with heart failure, the intervention can be transferred to benefit heart failure patients in similar outpatient clinics or primary care setting.

Sustainability of Effects and Plan to Maintain Effects

The participants had a face to face interaction with the student investigator regarding heart failure self-care management at the initial encounter, and a telephone follow-up was done once a month. There is a possibility of the participant not maintaining the lifestyle improvement and changes due to lack of motivation and reinforcement. Involving the participant's caregivers or family members serves as a resource to continue the ongoing support and reinforcement to manage heart failure symptoms effectively. The heart failure self-care management patient education brochure was made available for the clinic staff to utilize to benefit the heart failure patients during their follow-up visits.

Efforts to Minimize the Study Limitations

The student investigator took measures to avoid reinforcing information related to the SCHFI questionnaire to reduce the impact on the posttest score. The medical record data were used to assess the readmission rate to enhance the accuracy of data rather than depending on the participant's self-reports alone. The telephone follow-up was challenging at times due to time factors and holiday seasons. Setting a standard time on a particular day of the week would have been an excellent resource to overcome the barrier related to telephone follow-up.

Interpretation

Expected and Actual Outcomes

The expected project outcomes were a reduction in heart failure readmission rate, and only two participants (5%) admitted once to the hospital for heart failure readmission. The study results support the data that transitional care interventions aid in reducing heart failure readmission. The

project investigator expected a wide variety of ethnicity among the participants. Unfortunately, the participants from Hispanic and African American races were less in number than Caucasian. The reason for this could be the limitation of the setting to a single outpatient clinic. If the project investigator has planned to recruit participants from different locations, a wide variety of participants representing different ethnic groups could have been recruited for the project.

Intervention Effectiveness

The transitional care interventions were effective in reducing heart failure-related readmission among the participants. The clinic staff was cooperative and friendly in enabling the student investigator to identify the eligible participants for recruitment and manage the time productively by limiting the extra waiting time for the participants. The setting was an outpatient cardiovascular clinic, which enabled the student investigator to recruit 40 participants within three to four weeks. The cardiology providers were also interested in implementing the transitional care interventions to benefit their patients. They encouraged the participation of their patients by explaining the project's impact on reducing heart failure-related readmission. The interventions can be transferred to a similar outpatient clinic or any primary care clinic setting to benefit heart failure patients.

Intervention Revision

The transitional care interventions were effective in reducing heart failure readmission among the participants. The revisions that can be implemented might be setting a particular time and day for telephone follow-up to overcome the limitations with a time frame. In the future, the intervention can be implemented in variuos settings to support the generalization of the project.

Expected and Actual Impact on the Health System, Costs, and Policy

Heart failure is a chronic condition, and it requires effective self-care management to manage heart failure symptoms effectively and reduce readmission. The study results support the

evidence as participant readmission related to heart failure was reduced to 5% with effective self-care management and regular follow-up. Readmission and frequent hospitalization serve as an enormous economic burden on the health care system. Transitional care interventions play a significant role in reducing heart failure-related readmission and mortality rates in a cost-effective manner.

The hospital with a high readmission rate gets penalized as it reflects the quality of care (M., Rowden & Wheeler, 2015). Health policies strive to enhance the quality of health care services provided to the clients. Transitional care interventions play a key role in promoting quality by reducing unnecessary hospitalization, emergency room visits, and readmission among heart failure patients.

The student investigator did not obtain any external funding for the project as the cost is minimal. The printing cost for patient-educational material, pre and post questionnaire, and consent forms were only $105. The project investigator's funds were adequate to implement the project intervention successfully. The economic sustainability of the project intervention is significant as the clinic can use their existing printer to print the educational materials to benefit heart failure patients. The clinic staff have a key role in handing out the patient brochure during their scheduled follow-up and reinforce the heart failure self-care management with the patient and the caregivers to make a difference in effectively reducing the heart failure readmission rate.

Conclusion

Heart failure patients transition from the hospital setting to home setting following discharge is a challenging process. It is crucial to provide enhanced patient education regarding self-care management and ongoing support to manage their chronic illness effectively. Coordination of care and early follow-up are vital in exploring patients concerns and provides an individualized plan for managing their heart failure symptoms and reduce readmission.

Practical Usefulness

Transitional care interventions lay the foundation for a smooth transition following discharge. Heart failure patient's compliance with lifestyle changes such as fluid restriction, low salt diet, and prompt attention to warning signs of heart failure is significant in reducing unnecessary hospitalization and emergency room visit. It also reduces the health care cost and the financial burden and distress faced by patients with heart failure. Transitional care interventions not only impact the patient's health outcome but also improve health care quality by reducing readmission.

Further Study

Ongoing patient education and support are crucial in enabling heart failure patients to manage their illness with confidence and lead a high-quality life. The implementation of the transitional care intervention in other similar settings or primary care clinics will enhance heart failure patient's health outcome and wellness. A future study exploring the impact of support system and caregiver participation in promoting heart failure patient's self-care management skill serves as an added resource in effectively reducing the heart failure readmission. Measures to explore the intensity of transitional care interventions in relation to heart failure patients risk factor for hospitalization is a valuable resource to enhance heart failure patient's outcome.

Dissemination

The project investigator discussed the evidence-based intervention result outcome with St. Joseph city cardiology providers team and the chief executive officer of the organization. As the sustainability of the evidence-based intervention is realistic, the patient education brochure will be made available in the cardiology clinic and primary care for benefiting heart failure patients in the future. A poster presentation was done at the Advanced Practice Nurses of the Ozarks Conference at Branson, MO on November 8, 2019. The project results will be presented for the online poster

presentation to the Evidence-Based Practice Conference at Iowa on April 15, 2020. The student investigator will submit the project results for publication to the Journal of Clinical Nursing. The transitional care intervention will benefit patient's with heart failure and the health care system effectively.

References

Abbasi, A., Najafi Ghezeljeh, T., & Ashghali Farahani, M. (2018). Effect of the self-management education program on the quality of life in people with chronic heart failure: a randomized controlled trial. *Electronic Physician*, *10*(7), 7028–7037. https://doi.org/10.19082/7028

Ahmad, F. S., French, B., Bowles, K. H., Sevilla-Cazes, J., Jaskowiak-Barr, A., Gallagher, T. R., … Kimmel, S. E. (2018). Incorporating patient-centered factors into heart failure readmission risk prediction: A mixed-methods study. *American Heart Journal*, *200*(10), 75–82. https://doi.org/10.1016/j.ahj.2018.03.002

Albert, N. M., Barnason, S., Deswal, A., Hernandez, A., Kociol, R., Lee, E., … White-Williams, C. (2015). Transitions of Care in Heart Failure. *Circulation: Heart Failure*, *8*(2), 384–409. https://doi.org/10.1161/HHF.0000000000000006

Alligood, M. R. (2018). *Nursing theorists and their work* (9th ed.). Saint Louis, MO: Elsevier Inc.

American Heart Association. (2018). *Target: HF Strategies and Clinical Tools*. Retrieved from https://www.heart.org/en/professional/quality-improvement/target-heart-failure/strategies-and-clinical-tools

Barnason, S., Zimmerman, L., Hertzog, M., & Schulz, P. (2010). Pilot Testing of a Medication Self-Management Transition Intervention for Heart Failure Patients. *Western Journal of Nursing Research*, *32*(7), 849–870. https://doi.org/10.1177/0193945910371216

Benjamin, E. J., Muntner, P., Alonso, A., Bittencourt, M. S., Callaway, C. W., Carson, A. P., … Virani, S. S. (2019). Heart Disease and Stroke Statistics—2019 Update: A Report From the American Heart Association. *Circulation*, *139*(10). https://doi.org/10.1161/CIR.0000000000000659

Blum, M. R., Øien, H., Carmichael, H. L., Heidenreich, P., Owens, D. K., & Goldhaber-Fiebert, J. D. (2020). Cost-Effectiveness of Transitional Care Services After Hospitalization With Heart

Failure. *Annals of Internal Medicine*. https://doi.org/10.7326/m19-1980

Boyde, M., Peters, R., New, N., Hwang, R., Ha, T., & Korczyk, D. (2018). Self-care educational intervention to reduce hospitalisations in heart failure: A randomised controlled trial. *European Journal of Cardiovascular Nursing*, *17*(2), 178–185. https://doi.org/10.1177/1474515117727740

Bryant-Lukosius, D., Carter, N., Reid, K., Donald, F., Martin-Misener, R., Kilpatrick, K., … DiCenso, A. (2015). The clinical effectiveness and cost-effectiveness of clinical nurse specialist-led hospital to home transitional care: A systematic review. *Journal of Evaluation in Clinical Practice*, *21*(5), 763–781. https://doi.org/10.1111/jep.12401

Census Bureau ACS. (2017). St. Joseph, MO. Retrieved April 30, 2019, from https://datausa.io/profile/geo/st.-joseph-mo/#demographics

Centers for Disease Control and Prevention. (2019). Heart failure fact sheet. Retrieved March 15, 2019, from https://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_heart_failure.htm

Comín-Colet, J., Enjuanes, C., Verdú-Rotellar, J. M., Linas, A., Ruiz-Rodriguez, P., González-Robledo, G., … Bruguera, J. (2016). Impact on clinical events and healthcare costs of adding telemedicine to multidisciplinary disease management programmes for heart failure: Results of a randomized controlled trial. *Journal of Telemedicine and Telecare*, *22*(5), 282–295. https://doi.org/10.1177/1357633X15600583

Cummings, S., Bridgman, T., & Brown, K. G. (2016). Unfreezing change as three steps: Rethinking Kurt Lewin's legacy for change management. *Human Relations*, *69*(1), 33–60. https://doi.org/10.1177/0018726715577707

Davidson, P. M., Dracup, K., Phillips, J., Padilla, G., & Daly, J. (2007). Maintaining hope in transition: a theoretical framework to guide interventions for people with heart failure. *The Journal of Cardiovascular Nursing*, *22*(1), 58–64. https://doi.org/10.1016/j.gene.2007.02.023

Duff-Brown, B. (2020). *Study Finds Transitional Care Services Cost-Effective After Hospitalization for Heart Failure in Elderly*. Retrieved from https://fsi.stanford.edu/news/study-finds-transitional-care-services-cost-effective-after-hospitalization-heart-failure

Dunlay, S. M., & Roger, V. L. (2014). Understanding the epidemic of heart failure: past, present, and future. *Current Heart Failure Reports*, *11*(4), 404–415. https://doi.org/10.1007/s11897-014-0220-x

Feltner, C., Jones, C. D., Cené, C. W., Zheng, Z.-J., Sueta, C. A., Coker-Schwimmer, E. J. L. L., … Jonas, D. E. (2014). Transitional care interventions to prevent readmissions for persons with heart failure: a systematic review and meta-analysis. *Annals of Internal Medicine*, *160*(11), 774–784. https://doi.org/10.7326/M14-0083

Guirguis-Blake, J. (2016). Transitional care interventions to prevent readmissions for patients with heart failure. *American Family Physician*, *93*(5), 401–403. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/26926978

Hawkins, M. A. W., Dolansky, M. A., Levin, J. B., Schaefer, J. T., Gunstad, J., Redle, J. D., … Hughes, J. W. (2016). Cognitive function and health literacy are independently associated with heart failure knowledge. *Heart and Lung: Journal of Acute and Critical Care*, *45*(5), 386–391. https://doi.org/10.1016/j.hrtlng.2016.07.004

Horwitz, L. I. (2020). Taking Care Transitions Programs to Scale: Is the Evidence There Yet? *Annals of Internal Medicine*, (January), 285–286. https://doi.org/10.7326/M19-3872

Hospital Industry Data Institute. (2014). *Hospital quality spotlight on readmissions*. Retrieved from https://web.mhanet.com/HIDI_HealthStats_October_Readmissions_1.pdf

Jack, B. W., Chetty, V. K., Anthony, D., Greenwald, J. L., & Sanchez, G. M. (2009). Annals of Internal Medicine A Reengineered Hospital Discharge Program to Decrease

Rehospitalization: A randomized trial. *Annals of Internal Medicine, 150*(25), 178–187.

Jackson, C. T., Trygstad, T. K., DeWalt, D. A., & DuBard, C. A. (2013). Transitional care cut hospital readmissions for North Carolina medicaid patients with complex chronic conditions. *Health Affairs*, *32*(8), 1407–1415. https://doi.org/10.1377/hlthaff.2013.0047

Johansson, M., & Athilingam, P. (2020). Structured Telephone Support Intervention: Improved Heart Failure Outcomes. *JMIR Aging, 3*(1), e13513. https://doi.org/10.2196/13513

Kalter-Leibovici, O., Freimark, D., Freedman, L. S., Kaufman, G., Ziv, A., Murad, H., … Israel Heart Failure Disease Management Study (IHF-DMS) investigators. (2017). Disease management in the treatment of patients with chronic heart failure who have universal access to health care: a randomized controlled trial. *BMC Medicine*, *15*(1), 90. https://doi.org/10.1186/s12916-017-0855-z

Kripalani, S., Theobald, C. N., Anctil, B., & Vasilevskis, E. E. (2014). Reducing Hospital Readmission Rates: Current Strategies and Future Directions. *Annual Review of Medicine, 65*(1), 471–485. https://doi.org/10.1146/annurev-med-022613-090415

Lim, F., Foust, J., & Cleave, J. Van. (2016). Nursing standard of practice protocol: Transitional care. Retrieved March 12, 2019, from Hartford Institute for Geriatric Nursing. website: https://consultgeri.org/geriatric-topics/transitional-care

Low, L. L., Vasanwala, F. F., Ng, L. B., Chen, C., Lee, K. H., & Tan, S. Y. (2015). Effectiveness of a transitional home care program in reducing acute hospital utilization: A quasi-experimental study. *BMC Health Services Research*, *15*(1), 1–8. https://doi.org/10.1186/s12913-015-0750-2

M., Rowden, J., & Wheeler, A. (2015). Hospital quality spotlight on readmissions. *Hospital Industry Data Institute*, (October 2014), 1–6. Retrieved from https://web.mhanet.com/HIDI_HealthStats_October_Readmissions_1.pdf

Masterson Creber, R., Patey, M., Lee, C. S., Kuan, A., Jurgens, C., & Riegel, B. (2016). Motivational interviewing to improve self-care for patients with chronic heart failure: MITI-HF randomized controlled trial. *Patient Education and Counseling*, *99*(2), 256–264. https://doi.org/10.1016/j.pec.2015.08.031

McEwen, M., & Wills, E. M. (2019). *Theoretical basis for nursing* (5th ed.). Philadelphia, PA: Wolters Kluwer.

Meleis, A. I. (2010). *Transitions theory : Middle-range and situation specific theories in nursing research and practice*. New York, NY: Springer Publishing Company.

Melnyk, B. M., & Fineout-Overholt, E. (2019). *Evidence-based practice in nursing & healthcare: A guide to best practice* (4th ed.). Philadelphia, PA: Wolters Kluwer.

Miller, D. A., & Schaper, A. M. (2015). Implementation of a follow-up telephone call process for patients at high risk for readmission. *Journal of Nursing Care Quality*, *30*(1), 63–70. https://doi.org/10.1097/NCQ.0000000000000069

Morrison, J., Palumbo, M. V., & Rambur, B. (2016). Reducing preventable hospitalizations with two models of transitional care. *Journal of Nursing Scholarship*, *48*(3), 322–329. https://doi.org/10.1111/jnu.12210

Naylor, M. D., Bowles, K. H., McCauley, K. M., Maccoy, M. C., Maislin, G., Pauly, M. V., & Krakauer, R. (2011). High-value transitional care: translation of research into practice. *Journal of Evaluation in Clinical Practice*, *19*(5), no-no. https://doi.org/10.1111/j.1365-2753.2011.01659.x

Park, H. K., Branch, L. G., Bulat, T., Vyas, B. B., & Roever, C. P. (2013). Influence of a transitional care clinic on subsequent 30-day hospitalizations and emergency department visits in individuals discharged from a skilled nursing facility. *Journal of the American Geriatrics Society*, *61*(1), 137–142. https://doi.org/10.1111/jgs.12051

Poffo, M. R., Assis, A. V. de, Fracasso, M., Londero Filho, O. M., Alves, S. M. de M., Bald, A. P., … Alves Filho, N. R. (2017). Profile of Patients Hospitalized for Heart Failure in Tertiary Care Hospital. *International Journal of Cardiovascular Sciences*, *30*(3), 189–198. https://doi.org/10.5935/2359-4802.20170044

Retrum, J. H., Boggs, J., Hersh, A., Wright, L., Main, D. S., Magid, D. J., & Allen, L. A. (2013). Patient-identified factors related to heart failure readmissions. *Circulation: Cardiovascular Quality and Outcomes*, *6*(2), 171–177. https://doi.org/10.1161/CIRCOUTCOMES.112.967356

Riegel, B., Lee, C. S., Dickson, V. V., & Carlson, B. (2009). An update on the self-care of heart failure index. *The Journal of Cardiovascular Nursing*, *24*(6), 485–497. https://doi.org/10.1097/JCN.0b013e3181b4baa0

Rosswurm, M. A., & Larrabee, J. H. (1999). A model for change to evidence-based practice. *Image--the Journal of Nursing Scholarship*, *31*(4), 317–322. https://doi.org/10.1111/j.1547-5069.1999.tb00510.x

Sahlen, K.-G., Boman, K., & Brännström, M. (2016). A cost-effectiveness study of person-centered integrated heart failure and palliative home care: Based on a randomized controlled trial. *Palliative Medicine*, *30*(3), 296–302. https://doi.org/10.1177/0269216315618544

Sanders, T., Glogowska, M., Simmonds, R., McLachlan, S., Cramer, H., Sanders, T., … Purdy, S. (2015). Managing Patients With Heart Failure: A Qualitative Study of Multidisciplinary Teams With Specialist Heart Failure Nurses. *The Annals of Family Medicine*, *13*(5), 466–471. https://doi.org/10.1370/afm.1845.INTRODUCTION

Schipper, J. E., Coviello, J., & Chyun, D. A. (2016). Nursing standard of practice protocol: Heart failure: Early recognition, and treatment of the patient at risk for hospital readmission. Retrieved March 12, 2019, from Hartford Institute for Geriatric Nursing website:

https://consultgeri.org/geriatric-topics/fluid-overload

Scuffham, P. A. A., Ball, J., Horowitz, J. D. D., Wong, C., Newton, P. J. J., Macdonald, P., … WHICH? II Trial Investigators. (2017). Standard vs. intensified management of heart failure to reduce healthcare costs: results of a multicentre, randomized controlled trial. *European Heart Journal*, *38*(30), 2340–2348. https://doi.org/10.1093/eurheartj/ehx259

Sezgin, D., Mert, H., Özpelit, E., & Akdeniz, B. (2017). The effect on patient outcomes of a nursing care and follow-up program for patients with heart failure: A randomized controlled trial. *International Journal of Nursing Studies*, *70*, 17–26. https://doi.org/10.1016/j.ijnurstu.2017.02.013

Shaw, J. D., O'Neal, D. J., Siddharthan, K., Neugaard, B. I., O'Neal, D. J., Siddharthan, K., & Neugaard, B. I. (2014). Pilot Program to Improve Self-Management of Patients with Heart Failure by Redesigning Care Coordination. *Nursing Research and Practice*, *2014*, 1–10. https://doi.org/10.1155/2014/836921

Shaw, M. L. (2020). *Are Transitional Care Services Worth Investing In for Heart Failure?* Retrieved from https://www.ajmc.com/focus-of-the-week/are-transitional-care-services-worth-investing-in-for-heart-failure

Simmonds, R., Glogowska, M., McLachlan, S., Cramer, H., Sanders, T., Johnson, R., … Purdy, S. (2015). Unplanned admissions and the organisational management of heart failure: A multicentre ethnographic, qualitative study. *BMJ Open*, *5*(10), 1–12. https://doi.org/10.1136/bmjopen-2014-007522

Smith, J., Pan, D., & Novelli, M. (2016). A Nurse Practitioner-Led Intervention to Reduce Hospital Readmissions. *Journal for Nurse Practitioners*, *12*(5), 311–316. https://doi.org/10.1016/j.nurpra.2015.11.020

Smith, M. J., & Liehr, P. R. (2018). *Middle range theory for nursing* (4th ed.). New York, NY:

Springer Publishing Company, LLC.

Sokoreli, I., Cleland, J. G. G., Pauws, S. C. C., Steyerberg, E. W. W., de Vries, J. J. G. J. G., Riistama, J. M. M., … Clark, A. L. L. (2019). Added value of frailty and social support in predicting risk of 30-day unplanned re-admission or death for patients with heart failure: An analysis from OPERA-HF. *International Journal of Cardiology*, *278*(0), 167–172. https://doi.org/10.1016/j.ijcard.2018.12.030

Srisuk, N., Cameron, J., Ski, C. F., & Thompson, D. R. (2017). Randomized controlled trial of family-based education for patients with heart failure and their carers. *Journal of Advanced Nursing*, *73*(4), 857–870. https://doi.org/10.1111/jan.13192

Stauffer, B. D., Fullerton, C., Fleming, N., Ogola, G., Herrin, J., Stafford, P. M., & Ballard, D. J. (2011). Effectiveness and Cost of a Transitional Care Program for Heart Failure. *Archives of Internal Medicine*, *171*(14), 1238. https://doi.org/10.1001/archinternmed.2011.274

Travis, L., Hardin, S. R., Benton, Z. G., Austin, L., & Norris, L. W. (2012). A nurse-managed population based heart failure clinic: sustaining quality of life. *Journal of Nursing Education and Practice*, *2*(4), 1–10. https://doi.org/10.5430/jnep.v2n4p1

Van Spall, H. G. C. C., Rahman, T., Mytton, O., Ramasundarahettige, C., Ibrahim, Q., Kabali, C., … Connolly, S. (2017). Comparative effectiveness of transitional care services in patients discharged from the hospital with heart failure: a systematic review and network meta-analysis. *European Journal of Heart Failure*, *19*(11), 1427–1443. https://doi.org/10.1002/ejhf.765

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*(6), 562–571. https://doi.org/10.1370/afm.1844

Young, L., Kupzyk, K., & Barnason, S. (2017). The impact of self-management knowledge and

support on the relationships among self-efficacy, patient activation, and self-management in rural patients with heart failure. *Journal of Cardiovascular Nursing*, *32*(4), E1–E8. https://doi.org/10.1097/JCN.0000000000000390

Yu, D. S. F., Lee, D. T. F., Stewart, S., Thompson, D. R., Choi, K.-C., & Yu, C.-M. (2015). Effect of Nurse-Implemented Transitional Care for Chinese Individuals with Chronic Heart Failure in Hong Kong: A Randomized Controlled Trial. *Journal of the American Geriatrics Society*, *63*(8), 1583–1593. https://doi.org/10.1111/jgs.13533

Ziaeian, B., & Fonarow, G. C. (2016). The Prevention of Hospital Readmissions in Heart Failure. *Progress in Cardiovascular Diseases*, *58*(4), 379–385. https://doi.org/10.1016/j.pcad.2015.09.004

Appendix A

Definition of Terms

Heart failure: Medical condition in which the cardiac output is inadequate to meet the body's demands (Jameson et al., 2018).

Self-care: It is a process that involves decision making related to the choice of behavior to maintain physiologic stability (Riegel, Lee, Dickson, & Carlson, 2009).

Transition: It is a process of change from one condition or status to another (Fitzpatrick & McCarthy, 2014).

Transition care: Refer to programs that aid to influence patients' effective transition to the existing environment following discharge from the hospital (Fitzpatrick & McCarthy, 2014).

Self-care management: It is an active response taken in relation to the presenting symptoms to control them effectively (Riegel et al., 2009).

Teach-back method: Teach-back method is a way to check the patients understanding by asking them to state in their own words (Agency for Healthcare Research and Quality, 2015).

Appendix B

Logic Model for DNP Project

Student: Beulah Joshua

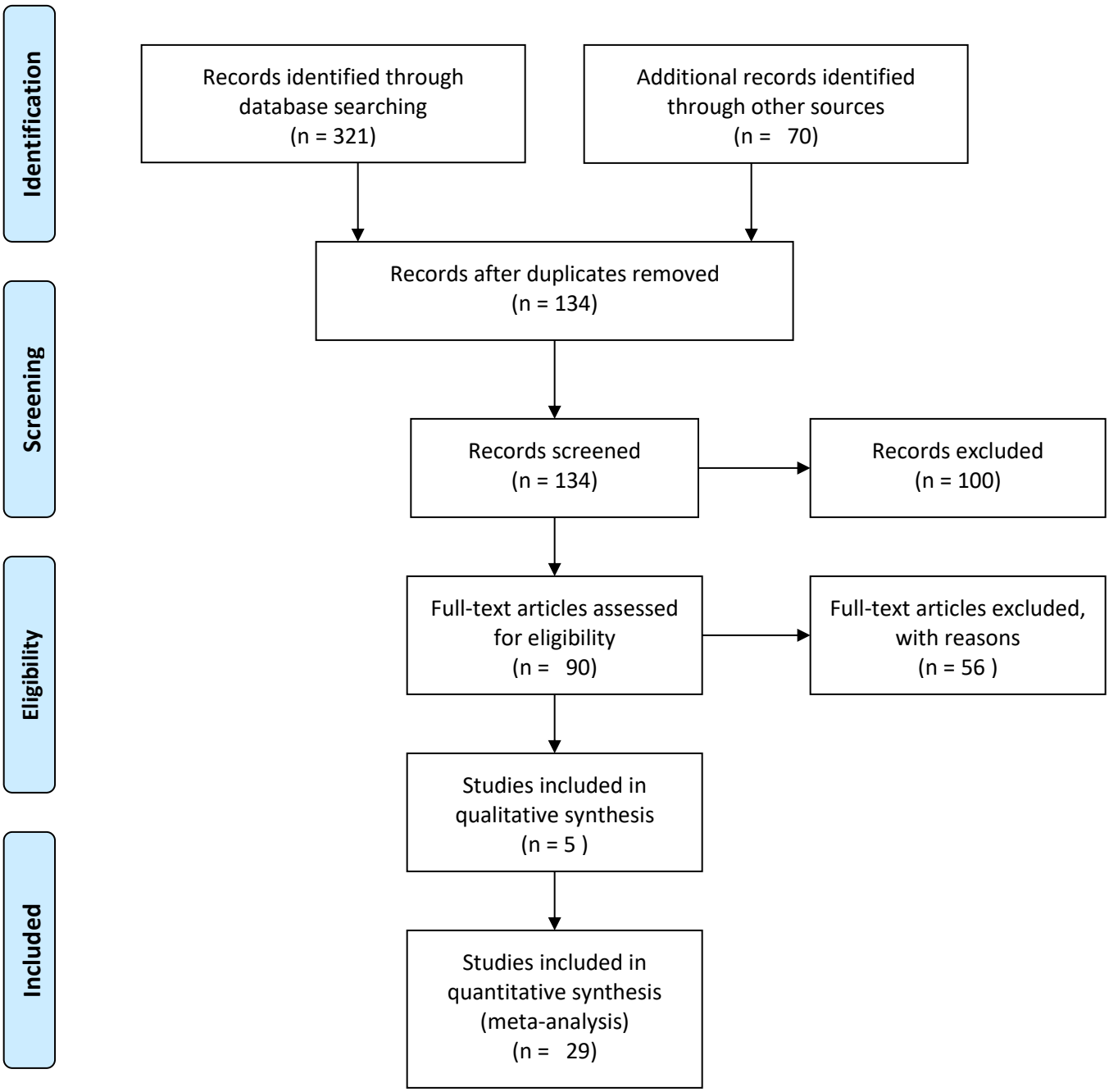
Inquiry, PICOTS: In adult patients with heart failure (P) will transitional care interventions after discharge (C) compared to routine office visits after discharge (I) contribute to patient's effective self-management of heart failure symptoms and reduce readmission (O) within a six-month period (T) in an outpatient setting (S)

Inputs	Intervention(s)	Outputs	Outcomes-Impact		
	Activities	Participation	Short	Medium	Long
Evidence subtopics 1. Nurse-managed transitional care 2. Care coordination 3. Quality of life 4. Cost-effectiveness 5. Bundled-transitional care intervention **Major facilitators or contributors** 1. Mosaic Chief Executive Officer (CEO) 2. Cardiovascular Office Providers 3. Case Manager 4. Lead Registered Nurse 5. Clinic staff 6. Cardiovascular office space **Major barrier or challenges** 1. Participants willingness to participate in the project 2. Managing clinic time 3. Managing workload 4. Coordination of patient care activities in the outpatient clinic 5. Project timeline	**EBP intervention which is supported by the evidence in the Input column (brief phrase)** Teach-back patient education related to heart failure self-care management Telephone follow-up once a month for the following six months to reinforce heart failure self-care management **Major steps of the intervention (brief phrases)** 1. Getting IRB approval from the organization for the project 2. Obtaining participants consent and recruitment of sample for the project 3. Self-care heart failure index questionnaire pretest 4. Patient education using the teach-back method regarding heart failure self-care management 5. Reinforcement of heart failure management with telephone follow-up 6. Post-test at the end of six months follow-up 7. Analyze the test results	**The participants (Subjects)** Adult patients with heart failure with a history of heart failure admission in the last six months period. **Site** Mosaic Life Care Cardiovascular Outpatient Clinic **Time frame** Six months **Consent or assent needed** Participants consent will be obtained **Other persons collecting data (Yes,no)** No **Others directly involved in consent or data collection (yes/no)** No	**Completed during DNP project)** **Outcomes to be measured** **Primary:** Reducing heart failure readmission **Measurement tool** Self-care of heart failure index version 6.2 **Statistical analysis to be used** Descriptive statistics to analyze demographic data Paired T-test to analyze heart failure self-care management pre and post-intervention Chi-square to assess the relationship between transitional care intervention and readmission rate	**(After student DNP)** **Outcomes to be measured** Heart failure-related hospitalization, emergency room visit, and readmission	**(After student DNP)** **Outcomes that are potential** Reduced heart failure readmission rate Increased quality of life Increased patient satisfaction, and health outcome

Rev. 7/09, 1/2015 http://www.uwex.edu/ces/lmcourse/interface/coop_M1_Overview.htm Logic-Model Worksheet content revisions by Lyla Lindholm for DNP Project. Not to be placed on web for public use. For UMKC DNP coursework only.

Appendix C

PRISMA 2009 Flow Diagram



Appendix C

Rating System for the Hierarchy of Evidence For an Interventional Inquiry (Modification by Dr. Lindholm for course N5613)	
Level I	Evidence from a systematic review or meta-analysis of all relevant RCTs. *Evidence-based clinical practice guidelines based on systematic reviews of RCTs).**
Level II	Evidence obtained from well-designed RCT. *Quantitative systematic review of well-designed controlled trial without randomization.*
Level III	Evidence obtained from well-designed controlled trial without randomization *(quasi-experimental). Quantitative systematic review of case-control, cohort, or correlational studies.*
Level IV	Evidence from well-designed case-control or cohort study *(or cross-sectional study)*
Level V	Evidence from systematic review of *quantitative* descriptive *(no relationships to examine)* or qualitative studies.
Level VI	Evidence from a single *quantitative* descriptive *(no relationships to examine in the study) or* qualitative study
Level VII	Evidence from the opinion of authorities and/or reports of expert committees

Melnyk, B.M.& Fineout-Overholt., E. (2015). *Evidence-based practice in nursing and healthcare.* Philadelphia Lippincott Williams & Wilkins*,.*

**Italics, appropriate in this category, modification by LL 2017 based on opinions from experts to place SR at one level higher than single study design level.*

Appendix D

Review of Evidence **Inquiry:** In adult patients with heart failure **(P)** will transitional care interventions after discharge **(I)** compared to routine office visits after discharge **(I)** contribute to patient's effective self-management of heart failure symptoms and reduce readmission **(O)** within a six-month period **(T)** in an outpatient setting **(S)**						
First author, year, title, Journal	**Purpose**	**Research Design[1], Evidence Level[2], & Variables**	**Sample & Sampling, Setting**	**Measures & Reliability (if reported)**	**Results & Analysis Used**	**Limitations & Usefulness**
Dilek Sezgin (2017), The effect on patient outcomes of a nursing care and follow-up program for patients with heart failure: A randomized controlled trial. International journal of nursing studies.	The purpose of the study was to analyze the effect of nursing care and follow-up for heart failure patients on self-care, quality of life, and rehospitalization	Quantitative Randomized control trial Level 2 Independent variable: Nursing care and follow-up care Dependent variable: Quality of life and rehospitalization rate	90 patients with heart failure Randomized sampling Heart failure outpatient clinic setting	The self-care of heart failure index and the left ventricular dysfunction scale. The reliability and validity of the self-care of heart failure index scale in the study have a Cronbach's α value of 0.79, 0.63 and 0.85 and the left ventricular dysfunction scale is 0.87.	The intervention group had significant improvement in self-care maintenance and quality of life when compared to the control group at three and six months. Data analysis by using SPSS 15.0. Independent group T-test	Possible interaction of patients in intervention and control group Randomized control design Realistic application
Jodi Smith (2016), A Nurse Practitioner-Led Intervention to Reduce	Application of LACE score to identify patients with high-risk readmissio	Quantitative Non-experimental Level 4	Total of 676 patients 532 patients received Post-	For patients discharged with LACE score of 11-15, the primary	Readmission rate for patients with heart failure who received PACT intervention	Not a randomized controlled study. May not be

Hospital Readmissions. The Journal for Nurse Practitioners.	n and implementation of Post-Acute Care Transition (PACT) interventions to reduce readmission.	Case-control study Independent variable: PACT home visit Dependent variable: Thirty-day readmission rate reduction	Acute Care Transition (PACT) intervention 144 patients served as controls Consecutive sampling	outcome related to 30-day readmission rate was calculated. The LACE tool was found to be highly accurate in predicting the risk of the outcome.	was statistically lower with a 95% confidence interval ($p<.05$). The 30-day readmission rate for the control group was 23.61% whereas for patients with PACT intervention it was 12.2%. The age and LACE score for both groups were compared using t-test.	representative of the target population.
Jessica Morrison (2016), Reducing Preventable Hospitalizations with Two Models of Transitional Care. Journal of Nursing Scholarship.	To describe the approaches and outcomes of two different transitional care programs	Quantitative, Non-experimental level IV Cohort study design Independent variable: Two models of transitional care program Dependent variable: Reduce hospitalization, health care cost,	98 participants in the CNS program. In PPC program 41 participants. Non-probability sampling (consecutive sampling)	The study used the pre-post single patient design without a control group. A retrospective chart review related to ED visit and hospitalization 120 days before and after intervention were compared.	As a result of (CNS) program, the mean number of hospitalizations for 120 days before intervention is 1.03 per patient and after the intervention is 0.21 per patient. The ED visits were 0.93 in pre-intervention and 0.22 in the post-	Sample bias Realistic use

		and emergency department visits			intervention period.	
Masterson Creber (2016), Motivational interviewing to improve self-care for patients with chronic heart failure: MITI-HF randomized controlled trial. Patient education and counseling.	The purpose of the study is to assess the efficacy of motivational interviewing to improve heart failure self-care behavior, heart failure physical symptoms, and quality of life	Quantitative Randomized control trial Level 2 Independent variable: Home-based motivational intervention and telephone follow-up Dependent variable: Improve heart failure self-care and quality of life	67 participants Randomized sample Single-blinded Heart failure patients hospitalized in an urban hospital setting	Self-care measured using the self-care of heart failure index V6.2 with reliability coefficient 0.78, 0.92, and 0.99 Heart Failure Somatic Perception Scale (HFSPS) to measure physical heart failure symptoms Kansas City Cardiomyopathy questionnaire (KCCQ) to measure the quality of life. Reliability Cronbach's α 0.92	Improvement in self-care maintenance and self-care confidence with significant improvement in the quality of life in the intervention group. Descriptive statistics Chi-square and students t-test	Lack of participants follow-up An objective measure of self-care
Doris S. F. Yu (2015), Effect of Nurse-Implemented Transitiona	The purpose of the study is to measure the effect of nurse-implemente	Quantitative Randomized control trial Level 2	178 participants Randomized sampling	Self-care heart failure index version 4 to measure self-care	Transitional care group patients had a reduction in readmission rate (8.1% Vs. 16.3%)	No data on cost savings of the program

l Care for Chinese Individuals with Chronic Heart Failure in Hong Kong: A Randomized Controlled Trial. Journal of the American Geriatrics Society.	d transitional care on readmission and mortality rates among patients with chronic heart failure	Independent variable: Nurse-led transitional care program Dependent variable: Reduction in hospital readmission, mortality rate and length of stay in the hospital	University-affiliated hospital in Hong-Kong	maintenance Dutch heart failure knowledge scale to measure patient's individual knowledge on how to manage heart failure Minnesota living with heart failure questionnaire to measure health-related quality of life	Reduction in mortality rate and shorter hospital stay with significant improvement in self-care and quality of life. Student t-test and Chi-square	Randomized control study Realistic use
Josep Comı´n-Colet (2014), Efficacy of an integrated hospital-primary care program for heart failure: a population-based analysis of 56,742 patients. Revista Espanola de cardiologia (English ed.).	The purpose of the study is to evaluate the feasibility and efficacy of an integrated primary care program for patients with heart failure in reducing readmission	Quantitative Non-experimental Level 4 Retrospective study design Independent variable: Nurse-based multidisciplinary approach Dependent variable: Patient empowerment and	56,742 patients Consecutive sampling Urban integrated health area	Heart failure disease management scoring to evaluate the quality of the program and heart failure intervention score to assess the quality of the intervention In both measurements, a higher score	Reduced the risk of heart failure readmission (hazard ratio 0.86) Positive impact on morbidity and mortality rates (hazard ratio 0.92) Chi-square test for categorical variable and student t-test for comparison of continuous variables	Lack of generalization Realistic use

		reduce readmission		indicates higher quality		
Brian W. Jack (2009), A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. Annals of internal medicine.	To access the effectiveness of discharge interventions designed to reduce hospital utilization following discharge	Quantitative Randomized control trial Level 2 Independent variable: Nurse-led discharge process Dependent variable: reduce hospitalization and emergency room visits within 30-days of discharge	749 adult patients Random sampling General medical service at an urban setting	Nurse discharge advocates (DAS) were trained to provide reengineered discharge (RED) interventions to coordinate patient discharge, medication reconciliation, individualized patient education, and follow-up instruction.	Reduced hospital utilization and cost saving of $412 per discharge. Total of 33.9% reduction in cost. The patients in the intervention group have a lower hospital utilization rate when compared to usual care group (0.314 vs 0.451). Poisson test and proportion test to measure the primary and secondary outcomes. Long-rank test to measure and compare the events.	The sample represented a younger population with fewer comorbid conditions Randomized control trial Realistic use
Judith E. Schipper (2016), Nursing standard of practice protocol: Heart failure: Early recognition	The primary objective is to establish a standard of practice protocols to reduce the incidence	Evidence-based guidelines Cochrane database of systematic reviews, CINAHL, MEDLINE, and PsycIN	Age group of participants 65 years and above. Article searches related to a meta-analysis in	Guideline Validation is done by external and internal peer review. Implementation tools	Improvement in patient's adherence to medical and self-care regimen Decrease in preventable readmission	Limited panel composition, potential for developer bias Realistic use

, and treatment of the patient at risk for hospital readmission. Hartford Institute for Geriatric Nursing.	of hospital readmission in patients with heart failure.	FO database. Independent variable: Early recognition and treatment of heart failure symptoms Dependent variable: reduce readmission	MEDLINE or systematic review in CINAHL.	include checklists, forms, chart documentation, and mobile device resources.	and length of hospital stay.	
Fidelindo Lim (2016), Nursing standard of practice protocol: Transitional care. Hartford Institute for Geriatric Nursing.	The guideline objective is to identify barriers to successful transition and enhance coordination of care during the transition from the health care setting.	Evidence-based guidelines Databases include the Cochrane Database of Systematic Reviews, CINAHL, MEDLINE, and PsychINFO. Independent variable: Transitional care intervention Dependent variable: Reduce emergency room visit and readmission rate	Articles with participants age group 65 and above. Meta-analysis articles in MEDLINE or Systematic Review in CINAHL.	The major outcomes considered include Patients empowerment, the rate of rehospitalization and emergency department visits, patient satisfaction and involvement with care during hospitalization and transition to another setting, the rate of safe and successful health care transition. Guideline Validation	Improved patient satisfaction and involvement in care during hospitalization and transition to other care settings. Reduction in emergency room visits and rehospitalization Enhanced empowerment of patients in making health care decision.	Limited panel composition, potential for developer bias. Realistic, patient-centered care

				is done by internal and external peer review.		
Margaret Glogowska (2015), Managing Patients with Heart Failure: A Qualitative Study of Multidisciplinary Teams with Specialist Heart Failure Nurses. The Annals of Family Medicine.	The purpose of the study is to gain understanding regarding the challenging issues faced by clinicians in taking care of patients with congestive heart failure.	Qualitative Level 6 Ethnographic study Independent variable: Barriers to continuity of care for heart failure patients Dependent variable: Unnecessary hospitalization	24 clinicians Purposive sampling	In-depth interview of clinicians and subsequent interviews were conducted to address the new issues that arose during the initial interview. The confirming and de confirming of data were done to refine the study results.	The study results identified two major areas that served as challenges to the clinicians: Communication with patients and communication within the team.	Limitations Lack of reflection of wider opinions from clinicians in general practice. Realistic use Reduce barriers
Rosemary Simmonds (2015), Unplanned admissions and the organizational management of heart failure: A multicentre ethnographic, qualitative study. BMJ Open.	The purpose of the study is to develop an understanding of the interaction between healthcare professionals, carers, patients, and system factors related to unplanned	Qualitative Level VI Ethnographic study Independent variable: In-depth interview to assess patient's perception regarding heart failure exacerbation	55 healthcare professionals, nine carers, and 31 patients with heart failure. Purposive sampling	An in-depth interview with patients or carers/family members along with recorded fieldwork conversations for impromptu interviews. Topic guid	The fragmented services and poor management created barriers to the continuity of care and increased the risk of hospital admission for heart failure.	An observer effect is resulting in participant behavior changes during observation. Realistic use

	hospital admissions.	s and readmission Dependent variable Fragmented service and improper care coordination increased the readmission rate		es were used for an in-depth interview with the participants . The initial coding fra mework was refined and recorded as new data were gathered. Member checking achieved credibility and trustworthi ness of the data.	The patient's lack of awareness rel ated to heart failure self-care and management increased the risk of unplanned admissions. The data were analyzed using the inductive, thematic approach with constant comparison.	
Lian Leng Low (2015), Effectiveness of a transitional home care program in reducing acute hospital utilization: A quasi-experimental study. BMC Health Services Research.	The purpose of the study is to measure the effect of transitional home care program in reducing acute hospital utilization.	Quantitative Quasi-experimental Level 3 One group, pre-post design Independent variable: Transitional home care program Dependent variable: Reducing hospital admission and	262 patients were enrolled in the study, but only 259 were analyzed due to missing data. Consecuti ve sampling	The primary study outcomes were related to hospital admission, emergency department (ED) visit and length of hospital sta y for participants enrolled in the transitional home care program at three- and six-months' period.	A reduction of 51.6% is noted in admission for participants, at the end of three months of enrollment in the program and at six-month period it was 52.8%. There was 48.2% reduction in emergency room visits. Moreover, patients enrolled in the program had shorter	Not a randomized control trial. The sample may not be representative of the target population . Realistic use

		emergency room visit			hospital stays. A Wilcoxon s igned rank test was used to analyze the difference in pre-and post-enrollment data.	
Jessica D. Shaw (2014), Pilot Program to Improve Self-Management of Patients with Heart Failure by Redesigning Care Coordination. Nursing Research and Practice	To examine the association between care coordination and patient self-care management among heart failure patients	Quantitative Quasi-experimental Level-3 Post-test only design Independent variable: To measure the effect of enhanced care coordination Dependent variable: Reduction on the severity of heart failure and hospitalization rate	Total of 40 participants 20 patients in the intervention group and 20 patients in the usual care group Consecutive sampling	The response from post-discharge phone calls done by RN Patient Care Facilitators (RN-PCFs) was compared between the intervention and usual care group.	In this study, the participants in the intervention group had fewer emergency room visits and rehospitalization for symptoms with heart failure when compared to the usual care group. The results were not statistically significant. Descriptive analysis, Fisher's exact test, and unpaired t-test were used to analyze the variables.	Potential bias related to the utilization of an investigator-designed questionnaire. Realistic use
Carlos T. Jackson (2013), Transitional care cut hospital readmissions for	To evaluate the effectiveness of the large-scale transitional program in reducing	Quantitative, Quasi-experimental Level 3, two group design.	13,476 participants received a transitional care intervention.	A twelve-month survival estimate is done for patients with transitional	Thirty-day readmission reduced from 123.3 to 110.7 per 1000 participants per year.	Endogeneity issues Lack of randomization,

North Carolina Medicaid patients with complex chronic conditions. Health Affairs	readmission among patients with complex chronic health care condition	Independent variable: timely outpatient follow-up with medical homes. Dependent variable Reduce hospitalization and readmission rate among high-risk patients	Consecutive sampling	care and usual care patients. An analysis of time duration between the initial discharge and subsequent readmission were also measured.	Patients who received transitional care intervention were 20% less likely to experience readmission when compared to patients with usual care. Stratified analysis	Realistic use Emphasis on patient self-care
Hae K. Park (2013), Influence of a transitional care clinic on subsequent 30-day hospitalizations and emergency department visits in individuals discharged from a skilled nursing facility. Journal of the American Geriatrics Society.	The purpose of the study is to evaluate the effect of post-discharge clinic intervention in improving care transition for patients at the time of discharge from SNF (Skilled Nursing Facility).	Quantitative Quasi-experimental Level 3 Pre-post design APN provides patient and care giver education Dependent variable: Reduce the readmission rate	217 participants in the intervention group 134 participants in the usual care group Consecutive sampling	In the post-discharge Clinic (PDC) intervention face-face encounter with the participants is done The primary outcomes measured include participants acute care inpatient days, the number of rehospitalization, and ED visits within 30 days of discharge from the SNF.	The post-discharge clinic (PDC) interventions helped to reduce the number of rehospitalization, the number of days spent in the hospital, and ED visits significantly per 1,000 patient days. t-test and chi-square	Generalizability is limited since the study was done at a single VA medical center consisting of 95% older white men. Realistic use Useful application of electronic medical records
I. Sokoreli (2019), Added	The purpose of the study is	Quantitative	1094 participants	Hospital anxiety and depression	Measures to assess physical	Limited to the 30-day outcome

value of frailty and social support in predicting risk of 30-day unplanned re-admission or death for patients with heart failure: An analysis from OPERA-HF.International journal of cardiology.	to assess the effect of frailty and social support in predicting heart failure patients' risk of admission within 30-days including mortality rate	Non-experimental Level 4 Cohort study design Independent variable: Measures of frailty and social support Dependent variable: Effect on heart failure patient's mortality and readmission rate within 30-days	Consecutive sampling Heart failure patients in the Hull and East Yorkshire Hospital	scale questionnaire General practitioner assessment of cognition screening tool to assess cognitive impairment A timed 'get up and go" test to assess physical frailty Self-reported family support system	frailty and social support system aid to predict heart failure patients at risk for readmission within 30-days of discharge Chi-square test to analyze the categorical variables Kruskal-Wallis test to analyze the continuous variable	Realistic use Identify high-risk heart failure patients
Alireza Abbasi (2018), Effect of the self-management education program on the quality of life in people with chronic heart failure: a randomized controlled trial. Electron Physician.	The purpose of the study is to evaluate the effect of a self-management education program on heart failure patient's quality of life	Quantitative Randomized control trial Level 2 Independent variable: Self-management education program sessions Dependent variable: Improvement in quality of life of the heart failure patients	60 participants with heart failure Convenience sampling method with random assignment Heart failure patients hospitalized in a teaching hospital in an urban area	Heart failure quality of life questionnaire reliability with Cronbach's alpha coefficient 0.922	The participants in the intervention group had significant improvement in self-care, psychological condition, and quality of life Chi-square and Fisher exact tests Independent sample t-test and paired sample t-test for quantitative	Lack of information on duration and method of patient education Realistic use

					variable comparison	
M. Boyde (2018), Self-care educational interventio n to reduce hospitalizat ions in heart failure: A randomized controlled trial. European Journal of Cardiovasc ular Nursing.	The purpose of the study is to evaluate the effectivene ss of applying a multimedia education interventio n to reduce unplanned hospital readmissio n among heart failure patients	Quantitative Randomized controlled trial Level 2 Independent variable: Education intervention Dependent variable: Improvemen t in self-care knowledge score and reduce unplanned readmission rate	200 participant s Randomiz ed sampling Heart failure patients in a tertiary referral hospital	The primary outcome is reduction in unplanned hospital readmissio n and the secondary outcome was change in knowledge and self-care behavior of heart failure patients Dutch heart failure knowledge scale Self-care of heart failure index v6.2	In the intervention group only 24 participants have unplanned readmission when compared to 44 participants in the control group at 12-months. The risk of readmission reduced by 30% in the intervention group Mann-Whitney U-test and Friedman test for comparison	Self-reported questionna ire Randomiz ed control trial Realistic applicatio n
Nittaya Srisuk (2017), Randomize d controlled trial of family-based education for patients with heart failure and their carers. Journal of advanced nursing.	The purpose of the study is to evaluate heart failure education program plan for patients and caregivers	Quantitative Randomized controlled trial Level 2 Independent variable: Face to face family-based heart failure education, telephone support and follow-up	50 participant s Randomiz ed sampling Cardiac outpatient clinic setting	The primary outcome is heart failure knowledge, and secondary outcome for patients include health-related quality of life and self-care	Patients and caregivers in the intervention group had higher knowledge scores. Patients have increased confidence, better self-care maintenance and heath-related quality of life	Study limited to a single setting Realistic applicatio n

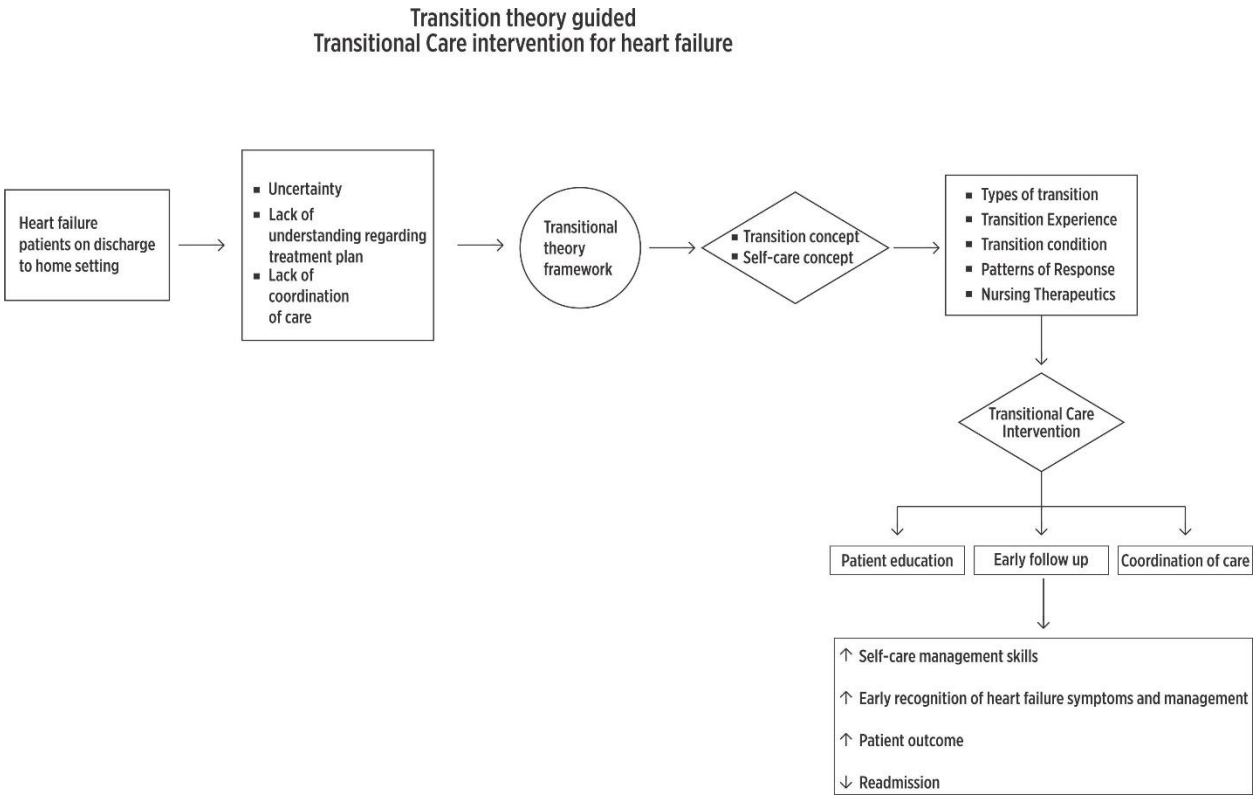
		Dependent variable: Improve self-care behavior, quality of life		Dutch heart failure knowledge scale to measure the knowledge about heart failure treatment Self-care of heart failure index to measure self-care behavior Minnesota living with heart failure to measure health-related quality of life	at three and six months. Descriptive analysis, Chi-square test, for nominal variables t-test and effect size	
Ofra Kalter-Leibovici (2017), Disease management in the treatment of patients with chronic heart failure who have universal access to health care: a randomized controlled trial. BMC Medicine.	The purpose of the study is to enhance disease management and improve outcome of heart failure patients	Quantitative Randomized controlled trial Level 2 Independent variable: Patient education and coordination of care Dependent variable: Enhance health related quality of life and	1360 participants Randomized sampling Maccabi Health Services Hospital	Six-minute walk test and New York Heart Association classification of heart failure stage Health-related quality of life assessment (SF-36) Depression symptom assessed with PHQ-9	Patients in the intervention group had a better health related quality of life and lower depression score and 33% reduction in readmission Non-linear mixed model for correlation SAS version 9.4	Lack of blinding Randomized control trial Realistic application

		reduce unnecessary hospitalization		depression scale		
Lucille Travis (2012), A nurse-managed population-based heart failure clinic: sustaining quality of life. Journal of Nursing Education and Practice.	The study aimed to examine the quality of life of heart failure patients attending a nurse-managed Population-Based Managed Care (PBMC) heart failure clinic.	Quantitative Non-Experimental Level-6 Descriptive study Independent variable: Health related quality of life Dependent variable: Sustaining quality of life	80 heart failure patients Convenience sample	A short form (SF) health survey with twelve questions was used to assess the participant's quality of life. The validity and reliability of the short form (SF) were well established and found to be a satisfactory tool.	The study results supported the fact that heart failure patients who attended the nurse managed PBMC heart clinic were able to maintain a decent quality of life over a 12-month period.	Lack of randomization may not be representative of the target population. Realistic use
Susan Barnason (2010), Pilot testing of a medication self-management transition intervention for heart failure patients. Western Journal of Nursing Research.	The purpose of the study is to measure the impact of hospital transition intervention program for older adults with heart failure to promote medication use self-care management.	Quantitative Quasi-experimental Level 3 Experimental design Independent variable: Hospital transition intervention Dependent variable: Increase medication adherence, self-	40 patients Consecutive sampling	Medication Regimen Complexity Index (MRCI), Brief Medication Questionnaire (BMQ), Drug Regimen Unassisted Grading Scale (DRUGS), and Kansas City Cardiomyopathy Questionnaire (KCCQ)	The transition group had significantly higher medication adherence at one month (p=.003) and three months (p=.03) with 88% adherence at one month and 95% at three months when compared to usual care group. The transition group had a higher level	Small sample size Heart failure self-care measurement was limited to medication adherence. Realistic use

		efficacy, and quality of life		The Cronbach's alpha coefficients for self-efficacy subscale is .86 to .88.	of self-efficacy with a higher mean score on KCCQ self-efficacy subscale ($p<.001$).	
Sevilla-Cazes J (2018), Heart Failure Home Management Challenges and Reasons for Readmission: a Qualitative Study to Understand the Patient's Perspective. Journal of General Internal Medicine.	The purpose of the study is to assess the patient and caregivers' barriers and challenges to home management and perceived reasons for heart failure readmission	Qualitative Ethnographic study Level 6 Independent variable: Open ended semi structured interviews Dependent variable: Patient-centered focus to reduce readmission	31 participants Purposive sampling Heart failure patient discharge from two different hospitals	Open ended semi-structured interview with heart failure patients to assess the perception related to heart failure management and the experience of living with heart failure. Focus group interview guides and triangulation to enhance internal validity	Patients socioeconomic factors, comorbidities, uncertainty about discharge instructions and hopelessness related treatment served as challenges to heart failure management. Grounded theory approach to analyze the data.	Observer effect affecting participants behavior Realistic use
P.A. Scuffham (2017, Standard vs. intensified management of heart failure to reduce healthcare costs: results of a	The purpose of the study is to assess the intensity of heart failure management program based on patient's risk factor	Quantitative Randomized control trial Level 2 Independent variable: Nurse-led post discharge home-based	787 patients Randomized sampling Heart failure patients from four tertiary hospital	Montreal cognitive assessment tool European self-care behavior scale Charlson comorbidit	Significant difference in cost reduction by applying intensified heart failure specific management intervention-based patients risk factor.	Lack of access to BNP monitoring Realistic application

multicentre, randomized controlled trial. European Heart Journal.	in reducing health care cost	interview and structured telephone support Dependent variable: Reduce health care cost and heart failure readmission		y index score Brain Natriuretic Peptide (BNP) level using the Alere heart check meter kit	Kaplan-Meier survival analysis Mann-Whitney u-test and students T-test	
Bryant-Lukosius D (2015), The clinical effectiveness and cost-effectiveness of clinical nurse specialist-led hospital to home transitional care: A systematic review. Journal of Evaluation in Clinical Practice.	The purpose of the study is to assess the clinical effectiveness and cost effectiveness of transitional care provided by Clinical Nurse Specialist (CNS)	Systematic review Randomized controlled trial Level 1 Independent variable: Transitional care interventions Dependent variable: Reduce healthcare cost	Thirteen articles with randomized controlled trials Study quality assessed by using Cochrane risk of bias and quality of health economics study tool	The quality of evidence for study outcomes evaluated using the grading of recommendations, assessment, development, and evaluation (GRADE) tool.	Discharge planning, patient education and care coordinated by CNS improved heart failure patient's adherence to treatment, patient satisfaction, reduced rehospitalization, length of stay, and cost Chi-square test for homogeneity and I^2 statistics	Lack of information regarding cost of application and outcome Randomized controlled trial Realistic use
Isabelle Vedel (2015), Transitional Care for Patients with Congestive Heart Failure: A Systematic Review and Meta-Analysis,	To determine the impact of transitional care interventions and identify the effective interventions for patients	Quantitative Systematic review and meta-analysis Level I Randomized controlled trials Independent variable: Transitional care intervention	41 study articles with randomized controlled trials Systematic research for study articles done by using MEDLIN	Advanced access scheduling for patients discharged with heart failure. Effective communication between hospitals, cardiologists, and PCP	Transitional care intervention (TCI) was more effective in reducing emergency department visit. The TCI for patients with CHF reduced the risk of	The research articles were restricted to English and French language Randomized controlled trial

The Annals of Family Medicine.	with heart failure	Dependent variable: Reduced the risk of readmission and emergency department visit	E, PsycINFO, EMBASE, and Cochrane database of systematic reviews.	regarding patients care and discharge. Telephone follow-up along with other Transitional care intervention.	all-cause readmission by 8% and emergency department visit by 29%. The I-2 statistics was used to measure the heterogeneity.	
Cynthia Feltner, (2014). Transitional care interventions to prevent readmissions for persons with heart failure: A systematic review and meta-analysis, Annals of Internal Medicine.	To assess the comparative effectiveness and efficacy of transitional care interventions to reduce readmission and mortality rates for patients with heart failure	Quantitative Systematic review and meta-analysis Level 1 Randomized, controlled trials Independent variable: Transitional care intervention focusing on patient or caregiver education Dependent variable: Reduce readmission and mortality rates	47 randomized controlled trials were included for the review based on inclusion criteria. MEDLINE, CINAHL, and the Cochrane library were used as a database to research for articles in English using human subjects, published from July 2007 to October 2013 with Randomized Controlled Trials (RCTs).	Dersimonian-Laird random-effects model was used for meta-analysis of outcomes. Risk ratio (RR) was calculated for readmission and mortality rates. Two reviewers assessed the outcome of each domain and the differences were resolved with an agreement.	According to the review, home visiting programs after discharge and Multidisciplinary Heart Failure Clinic (MDS-HF) interventions served as the best evidence for reducing readmission and mortality rate The Structured Telephone Support (STS) intervention helped to reduce heart failure specific readmission and mortality. Statistical heterogenicity was assessed using chi-square and statistics.	Potential publication and selective reporting bias Randomized controlled trial


Transition theory guided
Transitional Care intervention for heart failure
Heart failure patients on discharge to home setting
Uncertainty
Lack of understanding regarding treatment plan
Lack of coordination of care
Transitional theory framework
Transition concept
Self-care concept
Types of transition
Transition Experience
Transition condition
Patterns of Response
Nursing Therapeutics
Transitional Care Intervention
Patient education
Early follow up
Coordination of care
↑ Self-care management skills
↑ Early recognition of heart failure symptoms and management
↑ Patient outcome
↓ Readmission

Appendix F

March 27, 2019 Approval Date 3/27/19 JR

Beulah Joshua
UMKC Department of Nursing
4907 Wilshire Drive N
St. Joseph, MO 64506

Dear Beulah,

RE: In adult patients with heart failure will transitional care interventions after discharge compared to routine office visits after discharge contribute to patient's effective self-management of heart failure symptoms and reduce readmission within a six-month period in an outpatient setting.

The [redacted] Institutional Review Board (IRB) reviewed your proposed study as referenced above. The study was found to have minimal degree of risk to the research participants. The board approved the study based on criteria specified under 45 CFR 46.104.

You will not have any further requirements from the Institutional Review Board.

If something in your study changes, you must notify the IRB office immediately

Sincerely,

Mazda Biria, M.D.
Chairman, Institutional Review Board

Appendix F

UMKC School of Nursing and Health Studies

July 17, 2019

DNP Project Proposal Approval
UMKC DNP Student

This letter serves to provide documentation regarding Beulah Joshua's Doctor of Nursing Practice (DNP) project proposal. Ms. Joshua obtained approval for her proposal, *Transitional Care Interventions to Reduce Readmission in Patients with Heart Failure,* from the School of Nursing and Health Studies DNP faculty on July 17, 2019.

If we can provide further information, please feel free to contact us.

Sincerely,

Cheri Barber, DNP, RN, PPCNP-BC, FAANP
Clinical Assistant Professor
DNP Program Director
UMKC School of Nursing and Health Studies
barberch@umkc.edu

Lyla Lindholm, DNP, ACNS-BC
UMKC MSN-DNP Program Coordinator
Clinical Assistant Professor
DNP Faculty

UNIVERSITY OF MISSOURI-KANSAS CITY
2464 Charlotte • Kansas City, MO 64108-2718 • p 816 235-1700 • f 816 235-1701
www.umkc.edu/nursing • nurses@umkc.edu
an equal opportunity/affirmative action institution

Appendix G

Approval Date 3/27/19 JR

Letter of Consent

I am Beulah Joshua, student of University of Missouri-Kansas City, currently enrolled in DNP (Doctor of Nursing Practice) program. As a part of my school requirement, I am doing an evidence-based project related to reducing readmission among heart failure patients. Participation is entirely voluntary. The results of the project will be presented in the classroom. No identifiable data will be presented in the final form of this study and confidentiality will be maintained. The study consists of a pre and post survey which will be done in six-months duration using the self-care index of heart failure questionnaire and telephone follow-up. The benefit of participating in this study include the identification of a gap in knowledge related to self-management of heart failure and education regarding effective self-care management.

Giving of consent

I have read this cover letter and understand what is requested of me as a participant in this study. I freely consent to participate. I have been given satisfactory answers to my questions. I certify that I am at least 18 years of age.

Participants name

Phone

Signature of the participant

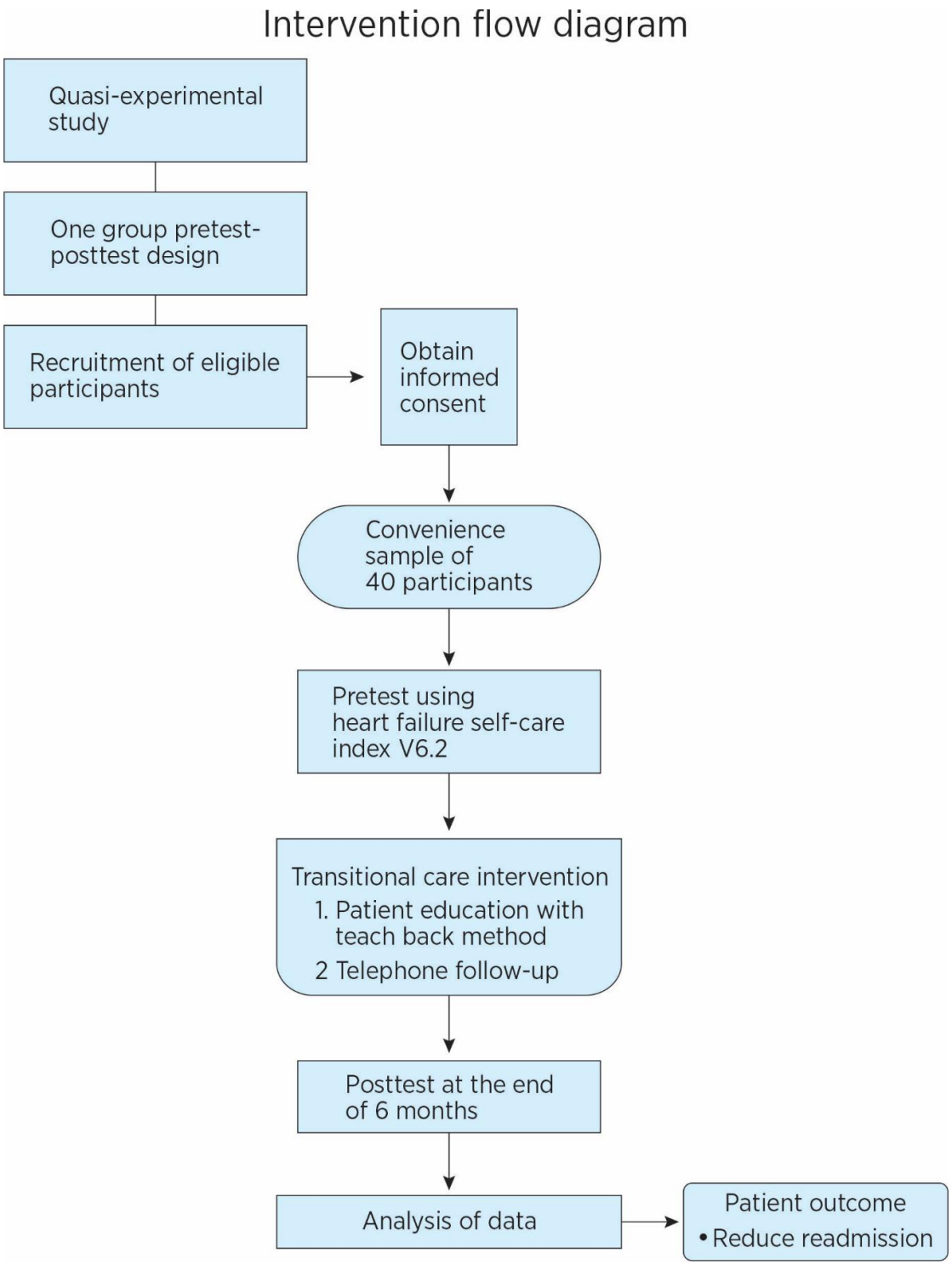
Date

Appendix H

Cost Table for Project

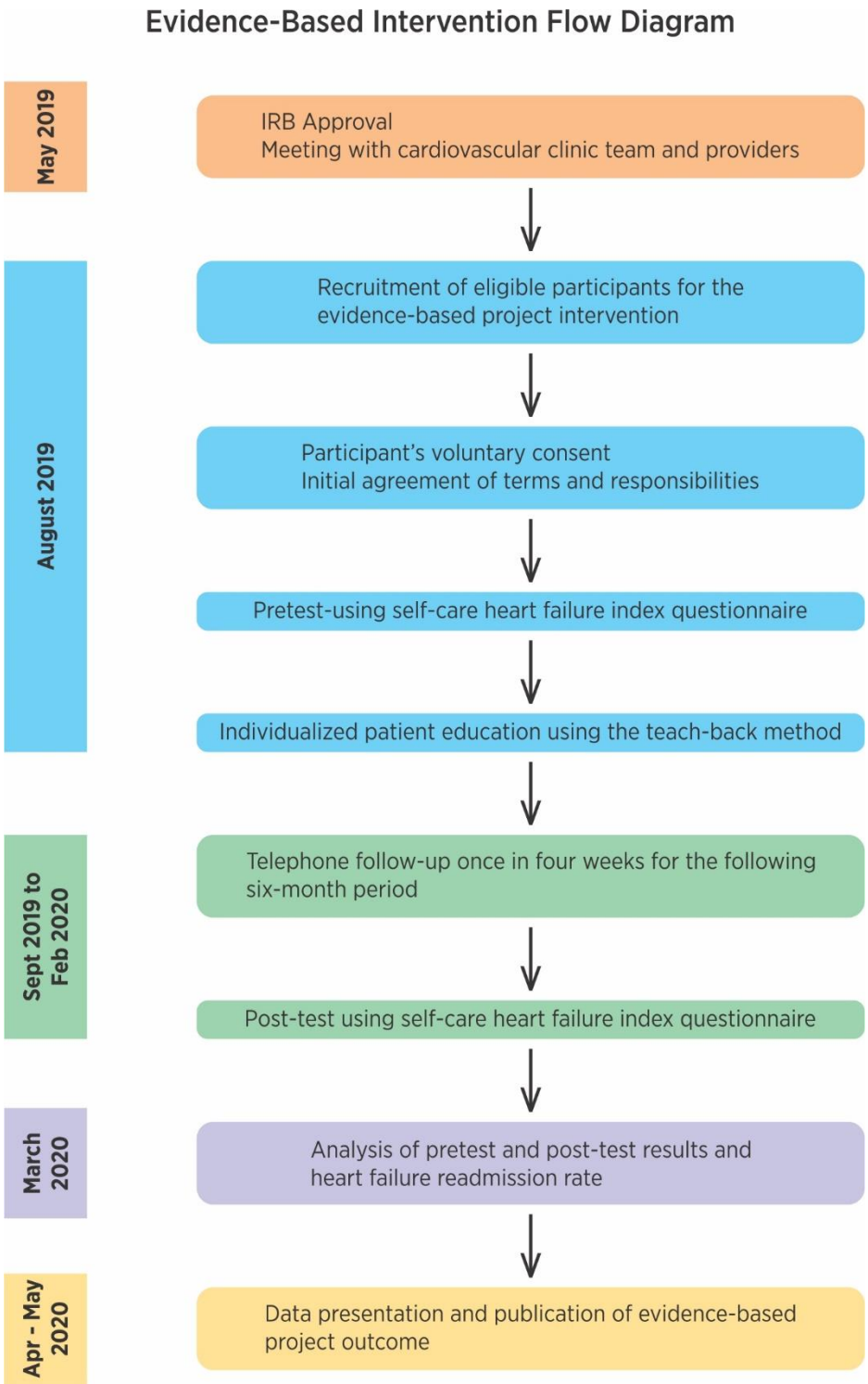
Item	Item description	Quality	Unit cost	Anticipated cost
1	Pre and post test questionnaire	80	0.65	$52.00
2	Patient education brochure	40	0.70	$28.00
3	Stationary	N/A	N/A	$25.00
4	Student time	165 hrs	N/A	N/A
5	cardiovascular office space	N/A	In kind	N/A
6	Telephone service	N/A	In kind	N/A
			Total	**$105.00**

Appendix I


Intervention flow diagram
Quasi-experimental study
One group pretest-posttest design
Recruitment of eligible participants
Obtain informed consent
Convenience sample of 40 participants
Pretest using heart failure self-care index V6.2
Transitional care intervention
1. Patient education with teach back method
2 Telephone follow-up
Posttest at the end of 6 months
Analysis of data
Patient outcome
• Reduce readmission

Appendix J

Project Time Line



Appendix K

Patient Education Material

What is hear failure?

Your heart is not able to pump as well as it should. It is a chronic problem and there is no cure, but you can manage it to keep it under control, so you feel better.

Significance of heart failure?

Nearly 5.7 million Americans live with heart failure. It results in an enlarged heart and most common reason for admission into the hospital.

What are the causes?

The most common cause is coronary artery disease. It is a condition in which the blood supply to the heart muscle is narrowed by building up of fatty deposit called plague.

Common risk factors:

- Past heart attack causing damage to the heart muscle
- Heart defects present at birth
- High blood pressure
- Heart valve disease
- Infection of the heart or heart valves
- Being overweight
- Diabetes
- Thyroid problem
- Alcohol or drug abuse
- Certain types of chemotherapy

What is ejection fraction?

Ejection fraction (EF) is a measure of the blood that the heart pumps out. It is the percentage of blood that the left ventricle moves with each beat. A normal EF is 50% to 70%.

What are the signs of heart failure?

- Shortness of breath, especially when lying down
- Tired, rundown feeling
- Coughing or wheezing, especially with exercise or lying down
- Swelling in feet, ankles, and legs
- Weight gain from fluid build-up

If heart failure can't be cured, why bother trying to treat it?

- As heart failure gets worse, your symptoms get worse too. It makes it harder to do activities of daily living (such as dressing and bathing)
- It also may make you too tired to do things that you enjoy, spending time with friends and family
- Treatment will help you feel better and keep your condition from getting worse.

What can I do to manage my heart failure?

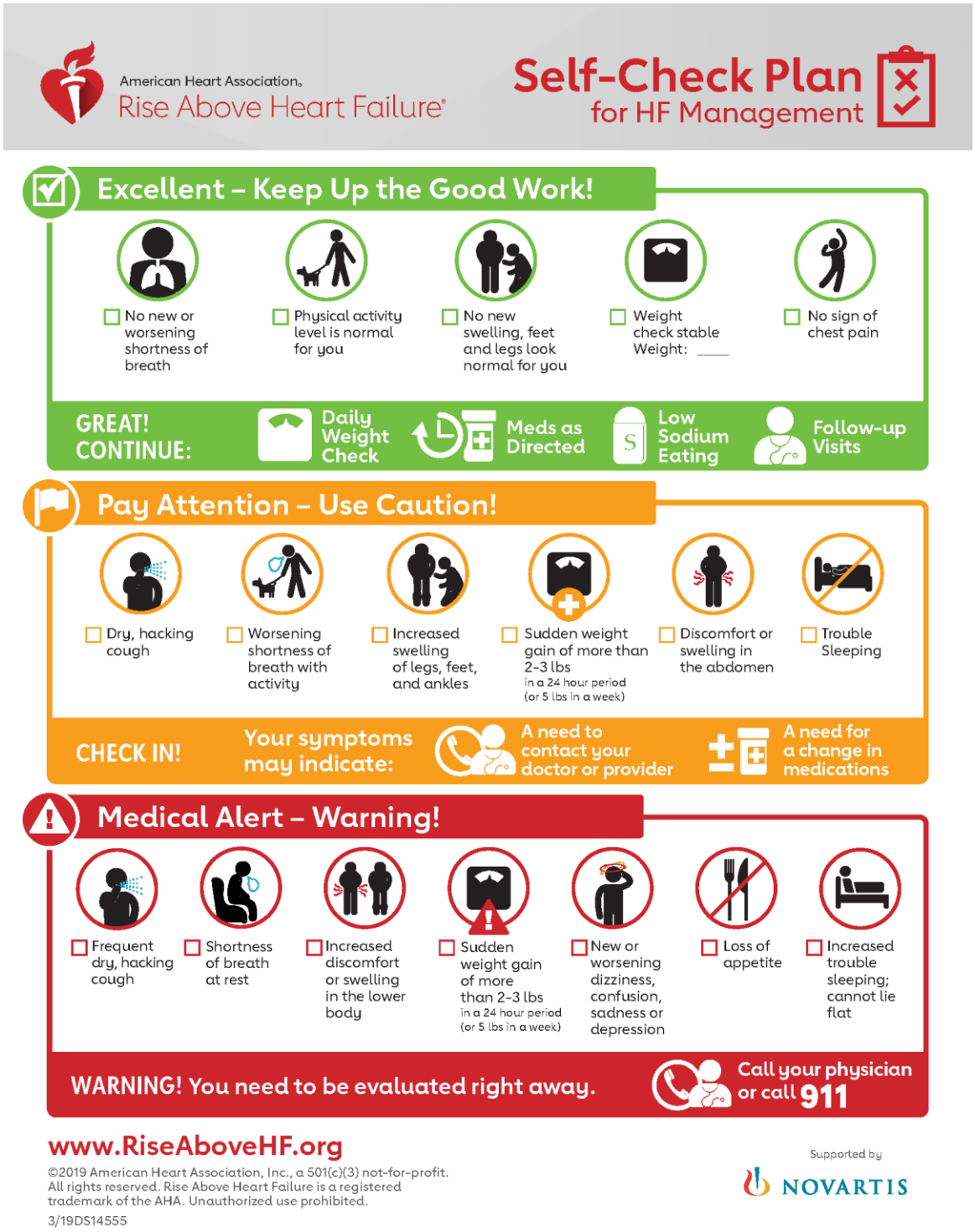
- Follow your providers advice
- Quit smoking, if you smoke
- Take your medications exactly as prescribed
- Weigh daily to check for weight gain caused by increased fluid
- Track your daily fluid intake
- Monitor your blood pressure daily
- Avoid or limit alcohol and caffeine
- Eat less salt and salty foods
- Be physically active

DOWNLOAD TODAY

Download on the App Store

Google play

Appendix K


American Heart Association.
Rise Above Heart Failure®
Self-Check Plan
for HF Management
Excellent – Keep Up the Good Work!
No new or worsening shortness of breath
Physical activity level is normal for you
No new swelling, feet and legs look normal for you
Weight check stable
Weight: ____
No sign of chest pain
GREAT! CONTINUE:
Daily Weight Check
Meds as Directed
Low Sodium Eating
Follow-up Visits
Pay Attention – Use Caution!
Dry, hacking cough
Worsening shortness of breath with activity
Increased swelling of legs, feet, and ankles
Sudden weight gain of more than 2-3 lbs
in a 24 hour period
(or 5 lbs in a week)
Discomfort or swelling in the abdomen
Trouble Sleeping
CHECK IN!
Your symptoms may indicate:
A need to contact your doctor or provider
A need for a change in medications
Medical Alert – Warning!
Frequent dry, hacking cough
Shortness of breath at rest
Increased discomfort or swelling in the lower body
Sudden weight gain of more than 2-3 lbs
in a 24 hour period
(or 5 lbs in a week)
New or worsening dizziness, confusion, sadness or depression
Loss of appetite
Increased trouble sleeping; cannot lie flat
WARNING! You need to be evaluated right away.
Call your physician or call 911
www.RiseAboveHF.org
©2019 American Heart Association, Inc., a 501(c)(3) not-for-profit. All rights reserved. Rise Above Heart Failure is a registered trademark of the AHA. Unauthorized use prohibited.
3/19DS14555
Supported by
NOVARTIS

Appendix L

SELF-CARE OF HEART FAILURE INDEX

All answers are confidential.

SECTION A:

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

	Never or rarely	Sometimes	Frequently	Always or daily
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

Appendix L

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 sure 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 free of heart failure symptoms?	1	2	3	4
18. Follow the treatment advice you have been given?	1	2	3	4
19. Evaluate the importance of your symptoms?	1	2	3	4
20. Recognize changes in your health if they occur?	1	2	3	4
21. Do something that will relieve your symptoms?	1	2	3	4
22. Evaluate how well a remedy works?	1	2	3	4

Appendix M

Analysis Power Calculation

[1] *-- Wednesday, June 12, 2019 -- 09:13:06*

t tests - Means: Difference from constant (one sample case)

Analysis:	Post hoc: Compute achieved power		
Input:	Tail(s)	=	One
	Effect size d	=	0.8
	α err prob	=	0.05
	Total sample size	=	40
Output:	Noncentrality parameter δ	=	5.0596443
	Critical t	=	1.6848751
	Df	=	39
	Power (1-β err prob)	=	0.9995574

Appendix N

Outcome analysis table

	State	Measurement instrument name	Tool validity & reliability	Permission need	Statistical analysis
Primary outcome	Reducing heart failure readmission	Self-care of heart failure index version 6.2	Satisfactory reliability of alpha .76 and significant validity with p<.05	No, it is a public domain	Paired t-test
Secondary outcome	Heart failure-related hospitalization, emergency room visit, and readmission	Self-care of heart failure index version 6.2	Satisfactory	No, it is a public domain	Paired t-test & chi-square statistical analysis
		Electronic medical data & self-report	Not applicable	Yes, access office records as part of project inquiry	
Demographics	Age, sex, ethnicity, & education	Not applicable	Not applicable	Not applicable	Descriptive statistics
Participant completion of the measurement tool: The student investigator will explain the purpose of the evidence-based project intervention and obtain informed voluntary consent of the participants. The participants will take a pre-test using the self-care of heart failure index questionnaire during their initial visit, and a post-test will be performed at the end of six months. The participants self-care ability will be measured using the test score results.					

Appendix N

Frequency Table

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	25	62.5	62.5	62.5
	female	15	37.5	37.5	100.0
	Total	40	100.0	100.0	

Age of Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Age 36-50	1	2.5	2.5	2.5
	Age 51-64	7	17.5	17.5	20.0
	Age 65-80	23	57.5	57.5	77.5
	Age above 80	9	22.5	22.5	100.0
	Total	40	100.0	100.0	

Race

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	caucasian	37	92.5	92.5	92.5
	african american	2	5.0	5.0	97.5
	hispanic	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

Level of education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	high school education	17	42.5	42.5	42.5
	Technical school	12	30.0	30.0	72.5
	undergraduate	10	25.0	25.0	97.5
	graduate	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

Appendix O

Data Collection Template

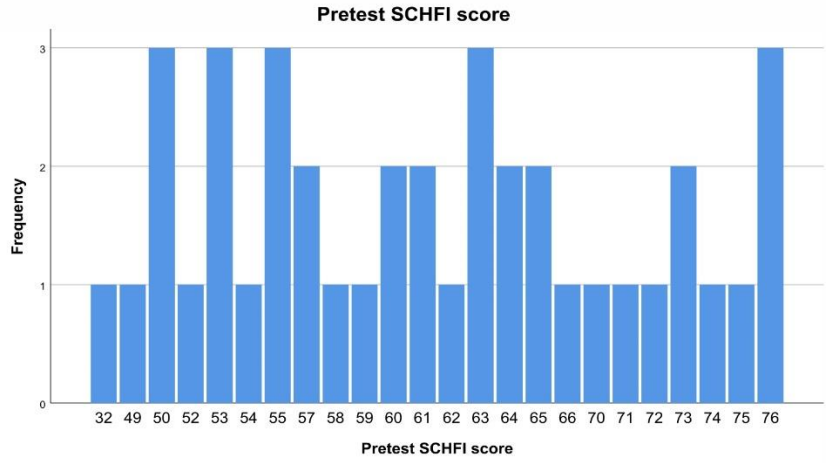
	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	ID	Numeric	8	0	Participant ID	None	None	8	Right	Nominal	Input
2	Gender	Numeric	8	0	Gender	{0, male}...	None	8	Right	Nominal	Input
3	Age	Numeric	8	0	Age of Particip...	{0, age 18-3...	None	8	Right	Nominal	Input
4	Ethnicity	Numeric	8	0	Race	{0, caucasia...	None	8	Right	Nominal	Input
5	Education	Numeric	8	0	Level of education	{0, no high ...	None	8	Right	Scale	Input
6	Readmission	Numeric	8	0	Number of read...	{0, No redmi...	None	8	Right	Scale	Input
7	Weighing	Numeric	8	0	Weigh yourself?	{1, never or ...	None	8	Right	Ordinal	Input
8	Ankle_swell...	Numeric	8	0	check your ank...	{1, never or ...	None	8	Right	Ordinal	Input
9	Avoid_gettin...	Numeric	8	0	Try to avoid get...	{1, never or ...	None	8	Right	Nominal	Input
10	Physical_ac...	Numeric	8	0	Do some physi...	{1, never or ...	None	8	Right	Nominal	Input
11	Appointments	Numeric	8	0	Keep doctor or ...	{1, never or ...	None	8	Right	Nominal	Input
12	Lowsalt_diet	Numeric	8	0	Eat a low salt d...	{1, never or ...	None	8	Right	Nominal	Input
13	Exercise	Numeric	8	0	Exercise for 30 ...	{1, never or ...	None	8	Right	Nominal	Input
14	Forget_med...	Numeric	8	0	Forget to take ...	{1, never or ...	None	8	Right	Nominal	Input
15	Eating_out	Numeric	8	0	Ask for low salt...	{1, never or ...	None	8	Right	Nominal	Input
16	System_re...	Numeric	8	0	Use a system t...	{1, never or ...	None	8	Right	Nominal	Input
17	Past_trouble	Numeric	8	0	In the past mon...	{0, no}...	None	8	Right	Nominal	Input
18	Recognize	Numeric	8	0	How quickly did...	{0, i did not ...	None	8	Right	Nominal	Input
19	Reduce_salt	Numeric	8	0	Reduce the salt...	{1, not likely...	None	8	Right	Nominal	Input
20	Reduce_fluid	Numeric	8	0	Reduce your flu...	{1, not likely...	None	8	Right	Nominal	Input
21	Extra_pill	Numeric	8	0	Take an extra ...	{1, not likely...	None	8	Right	Nominal	Input
22	Call_provider	Numeric	8	0	Call your doctor...	{1, not likely...	None	8	Right	Nominal	Input
23	Past_remedy	Numeric	8	0	How sure were ...	{1, not sure}...	None	8	Right	Nominal	Input
24	Free_of_sy...	Numeric	8	0	Keep yourself fr...	{1, not confi...	None	8	Right	Nominal	Input
25	Follow_treat...	Numeric	8	0	Follow the treat...	{1, not confi...	None	8	Right	Nominal	Input
26	Evaluate_sy...	Numeric	8	0	Evaluate the im...	{1, not confi...	None	8	Right	Nominal	Input
27	Recognize_...	Numeric	8	0	Recognize cha...	{1, not confi...	None	8	Right	Nominal	Input
28	Do_something	Numeric	8	0	Do something t...	{1, not confi...	None	8	Right	Nominal	Input
29	Evaluate_re...	Numeric	8	0	Evaluate how w...	{1, not confi...	None	8	Right	Nominal	Input
30	Pretest_score	Numeric	8	0	Pretest SCHFI ...	None	None	8	Right	Nominal	Input
31	Post_weighi...	Numeric	8	0	Weigh yourself?	{1, never or ...	None	8	Right	Nominal	Input
32	Post_ankle...	Numeric	8	0	Check your ank...	{1, never or ...	None	8	Right	Nominal	Input
33	Post_avoid_...	Numeric	8	0	Try to avoid get...	{1, never or ...	None	8	Right	Nominal	Input
34	Post_physi...	Numeric	8	0	Do some physi...	{1, never or ...	None	8	Right	Nominal	Input
35	Post_appoi...	Numeric	8	0	Keep doctor or ...	{1, never or ...	None	8	Right	Nominal	Input
36	Post_lowsal...	Numeric	8	0	Eat a low salt d...	{1, never or ...	None	8	Right	Nominal	Input
37	Post_exercise	Numeric	8	0	Exercise for 30 ...	{1, never or ...	None	8	Right	Nominal	Input
38	Post_forget...	Numeric	8	0	Forget to take ...	{1, never or ...	None	8	Right	Nominal	Input

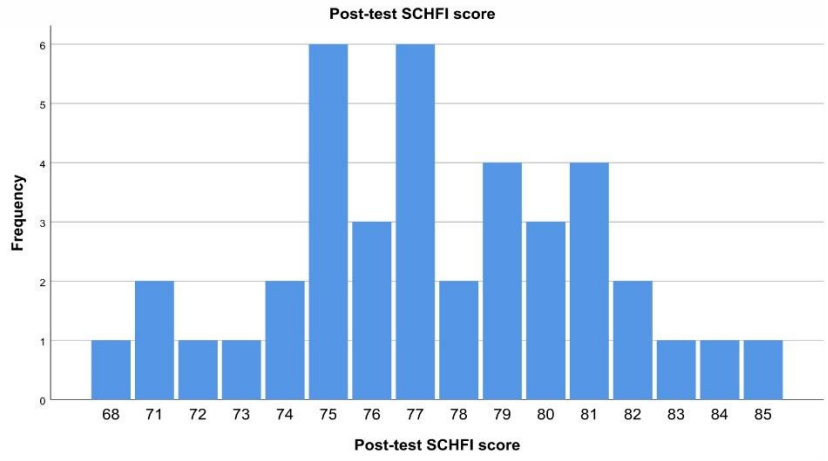
Appendix P

Frequencies

Statistics

		Pretest SCHFI score	Post-test SCHFI score
N	Valid	40	40
	Missing	0	0
Mean		61.13	77.38
Median		61.00	77.00
Mode		50[a]	75[a]
Std. Deviation		9.530	3.726
Range		44	17

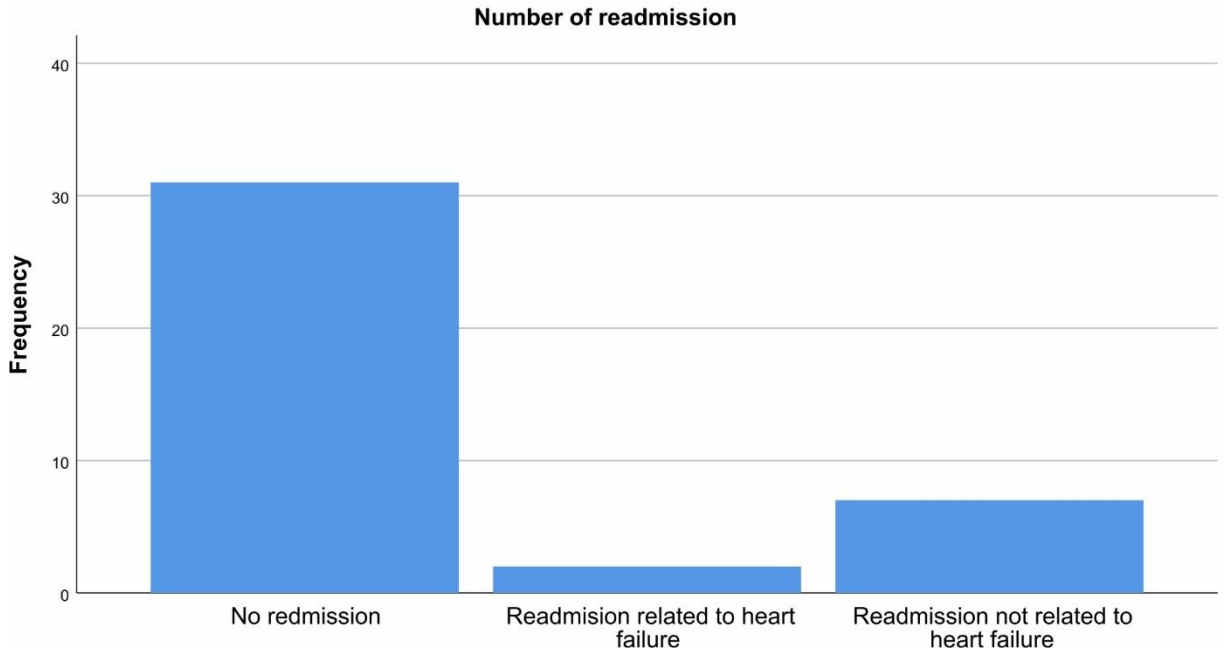




Appendix Q

Number of readmission

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No redmission	31	77.5	77.5	77.5
	Readmision related to heart failure	2	5.0	5.0	82.5
	Readmission not related to heart failure	7	17.5	17.5	100.0
	Total	40	100.0	100.0	



Appendix R

Frequency Table

Weigh yourself?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	23	57.5	57.5	57.5
	always or daily	17	42.5	42.5	100.0
	Total	40	100.0	100.0	

Check your ankles for swelling?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	sometimes	1	2.5	2.5	2.5
	frequently	15	37.5	37.5	40.0
	always or daily	24	60.0	60.0	100.0
	Total	40	100.0	100.0	

Eat a low salt diet?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	sometimes	2	5.0	5.0	5.0
	frequently	12	30.0	30.0	35.0
	always or daily	26	65.0	65.0	100.0
	Total	40	100.0	100.0	

Forget to take one of your medicines?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	never or rarely	37	92.5	92.5	92.5
	sometimes	3	7.5	7.5	100.0
	Total	40	100.0	100.0	

Keep yourself free of heart failure symptoms?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very confident	13	32.5	32.5	32.5
	extremely confident	27	67.5	67.5	100.0
	Total	40	100.0	100.0	

Follow the treatment advice you have been given?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very confident	5	12.5	12.5	12.5
	extremely confident	35	87.5	87.5	100.0
	Total	40	100.0	100.0	