

Assessing Health Literacy to Improve Heart Failure Self-Management through Video-Based
Education Counseling

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Abstract

Background: The Heart Failure Society of America recommends assessment of health literacy in heart failure (HF) patients and the use of various learning options such as videos. Health literacy affects an individual's ability to engage in self-care and chronic disease management. Self-care regimens in HF are complex, which requires consistent educational resources and patient-centered approaches. Tailored interventions using video-based education (VBE) may represent a strategy to improve disease management in HF patients with literacy deficits.

Purpose: This project evaluated the effectiveness of VBE counseling on improving self-management and knowledge in adult HF patients in an outpatient setting. Differences were examined between participants with adequate and limited health literacy in improving HF self-management skills and HF knowledge after receiving VBE counseling.

Methods: A one-group pretest-posttest design was used in a convenience sample of fifteen participants from two outpatient HF clinics. Ten participants completed the six-week study. Participants enrolled for individualized weekly counseling support consisting of health literacy screening, a VBE brochure, HF VBE access via tablet or personal computer, and 15-30-minute telephone consultations and face-to-face education sessions with a healthcare provider. Four questionnaires were used to collect the data: a demographic questionnaire, the Short Test of Functional Health Literacy in Adults, the Self-Care of HF Index v. 7.2, and the Atlanta HF Knowledge Test.

Results: The project demonstrated significant differences across variables in pre-post intervention scores. HF knowledge increased (mean 2.0, SD = 2.10, $p = .011$). Self-care management (mean 18.48, SD = 14.24, $p = .005$) and symptom perception improved

significantly (mean 12.39, SD = 14.67, $p = .021$). Self-care maintenance (mean 11.25, SD = 8.99, $p = .003$) and self-care confidence scores (mean 9.0, SD = 10.15, $p = .015$) were significant respectively. There were no significant differences in improving HF knowledge, self-care maintenance, and self-care symptom perception between the adequate and limited health literacy groups. There were significant differences in improving self-care management (mean 8.08, SD = 3.49, $p = .033$) and self-care confidence (mean .00, SD = 2.50, $p = .017$) between the health literacy groups.

Conclusion: VBE counseling was effective for improving HF self-management and knowledge for adult HF patients with limited or adequate health literacy. Health literacy screening individualizes education and identifies patients who require more educational support to make lifestyle and behavioral changes. VBE may be considered as an important adjunct to support HF management in outpatient settings.

Implications for Practice: DNP-prepared nurses are at the forefront of healthcare to improve the quality and delivery of patient education by directing educational programs for chronic disease management. HF nurses or navigators are essential healthcare professionals who can assist HF patients to adapt self-management skills through the use of VBE. DNP-prepared nurses are in the position to foster a multidisciplinary approach to patient education that focuses on health literacy and tailored educational interventions.

Keywords: health literacy, heart failure, self-management, video-based education, counseling, patient-centered care

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Assessing Health Literacy to Improve Heart Failure Self-Management through Video-Based Education Counseling

Heart Failure (HF) is an epidemic health problem that affects more than six million individuals in the United States (Yancey et al., 2013). Nearly eight million Americans are estimated to live with HF by 2030 (Benjamin et al., 2017). Almost 1.4 million persons with HF are under 60 years of age and more than 5% of persons age 60-69 have HF (Yancey et al., 2013). HF is a progressive disease in which the heart's muscle becomes too weak or stiff to pump enough blood to supply the body's needs (Yancey et al., 2013). Cardiovascular conditions such as high blood pressure, coronary artery disease, or myocardial infarction can injure the heart muscle and contribute towards the development of HF. Over time, this condition worsens and patients begin to experience physiologic complications that decrease the quality of life.

According to a report by the American Heart Association (AHA), HF causes one out of every nine deaths (Benjamin et al., 2017; Pekmezaris et al. 2018). HF is a financial burden on the health care system and accounts for \$31 billion of annual medical care costs (Yancey et al., 2013). It is the number one cause of hospitalizations in the Medicare population and the total cost of care is expected to rise from \$31 billion to \$70 billion in 2030 (Benjamin et al., 2017). The fifteen-year mortality rate still is 71.8% for men and 39.1% for women despite innovative therapies and care practices (van Riet, Hoes, Wagenaar, Limburg, Landman, & Rutten, 2016). Unfortunately, more than half of those who develop end-stage HF die within five years of diagnosis (Yancey et al., 2013). The high mortality rate caused by HF subsequently challenges the efforts of the healthcare system to improve health outcomes.

In 2013, the American College of Cardiology (ACC) and the American Heart Association (AHA) introduced guidelines to direct health care professionals to make appropriate decisions in

managing the care of HF patients. These guidelines received a focused update in 2017. Studies have shown that HF patients treated with ACC/AHA guideline-recommended therapies have been associated with a 13% lower risk of death and increases the likelihood of survival (Yancey et al., 2013). The ACC/AHA guideline recommends that patients with HF should receive specific education to facilitate HF self-care (Benjamin et al., 2017). Self-care can be defined as a decision-making process involving the choice of behaviors that maintain physiologic stability and the response to symptoms when they occur (Riegel et al., 2010). Yancey et al. (2013) emphasize that self-care education is a process measure that is recommended for patients' plan of care. Self-care regimens for HF patient are typically complex and multifaceted, therefore requiring consistent access to adequate health care resources and a variety of educational materials (Boyne et al., 2014; Yancey et al., 2013; Savarese & Lund, 2017).

In addition to improving HF self-care education, health literacy is also one of the major components to effectively treat HF (Cajita, Cajita, & Han, 2016). Health literacy can be defined as the patients' degree of gaining access, processing, and understanding health information, which plays a key role in making informed decisions concerning their health (Wonggoom, Du, & Clark, 2018). According to the National Assessment of Adult Literacy, only 12% of English-speaking adults have proficient health literacy, which denotes that nearly nine out of ten adults may lack the skills needed to manage their health and prevent disease (Kutner, 2006). The U.S. Department of Health and Human Services (HSS) states that health literacy affects people's ability to engage in self-care and chronic disease management, navigate the health care system, locate providers or health services, understand probability or risk concepts, and share personal information for health histories (Kutner et al., 2006). Studies of individuals with HF indicate that readmission rates, emergency room visits, and mortality rates are high amongst those with low

health literacy (Moser et al., 2015; McNaughton et al., 2015). HF readmissions can often be related to health illiteracy and miscomprehension of vital patient education. As a result, HF is difficult to manage effectively if patients are not in a position to adhere to medical recommendations or modify self-management behaviors.

Many healthcare providers may be unaware of literacy problems in their patients and view health illiteracy as a minor issue among their patients, though statistics show otherwise (Evangelista et al., 2010). Healthcare providers have argued that there is a challenge in managing HF in patients with limited health literacy due to non-adherence to treatment plan and lack of knowledge which subsequently leads to hospital readmissions and emergency visits (Zullig et al., 2014). Patients with limited health literacy may have difficulty relying on written clinical materials that are provided for patient appointments, informed consent for treatment and clinical trial participation, and complications of their treatment (Cox, Bowmer, & Ring, 2011). Health literacy screening in healthcare settings may enhance disease management for chronic diseases such as HF that requires a patient-centered approach to self-care regimens.

Purpose of the Project

The Heart Failure Society of America recommends that a patient's health literacy level should be acknowledged and documented in their medical record (Evangelista et al., 2010). Limited health literacy amongst HF patients has been associated with poor health outcomes such as higher rates of readmissions and less frequent use of preventive services (Kutner, 2006). HF patients with low health literacy comprises of 27% to 54% of the HF population (Evangelista et al., 2010). Individuals with limited health literacy may not be able to understand written health materials or prescription labels. An organization that values health literacy makes it a priority to implement systems and interventions such as visual aids and counseling that increase

understanding and advance patient safety (Brach et al., 2012). It is the responsibility of the health care team to recognize patients with limited health literacy and provide them with additional support to enhance self-care and optimize therapy (Evangelista et al., 2010). Unfortunately, there is currently no systematic training to improve the provider's management of patients with limited health literacy (Schapira et al., 2017). Addressing health literacy is critical to achieving the objectives set forth in Healthy People 2020 and the key to the success of the national health agenda (Lindenfield et al., 2010). Thus, health literacy screening in clinical settings can greatly support the patient's needs to improve their health and make informed healthcare decisions

An innovative method for delivering patient education in HF patients with literacy deficits is video-based education (VBE). Utilizing VBE for HF patients may improve knowledge retention and build comprehension skills that are necessary for disease management. Providing VBE as an option to obtain health information may enhance a patient's confidence and motivation to engage in self-care behaviors, thus preventing poor health outcomes. The sophistication of health information technology increases the feasibility of a tailored approach to health education in those with chronic diseases (Schapira et al., 2017). There is currently no gold standard educational intervention for HF patients (Boyd & Peters, 2014). Tailoring educational interventions to an individual's health literacy level may be effective in clinical settings when outcomes of disease knowledge and self-management of chronic disease are of interest (Schapira et al., 2017). Therefore, the purpose of this project was to evaluate the effectiveness of using VBE counseling to improve HF self-management and HF knowledge in adult HF patients. The project also examined the differences between adequate and limited health literacy groups in improving HF self-management behaviors and knowledge after receiving VBE counseling.

Research Questions

In adult HF patients, does the provision of VBE counseling improve HF self-management and knowledge in an outpatient setting?

Is there a significant difference between adequate and limited health literacy groups in improving HF self-management behaviors and knowledge after receiving VBE counseling?

Review of Literature

A literature review was conducted in February 2019 through June 2019. A search strategy was assisted and supervised by a research librarian with experience in conducting systematic and scoping reviews. Articles that described any aspect of educational interventions in HF patients regarding the assessment or identification of health literacy and the use of video education were reviewed. Studies that investigated epidemiology in heart failure, patient education, self-care in heart failure, heart failure knowledge, heart failure readmissions, and measurement of HF outcomes were also reviewed. A comprehensive set of electronic databases (PubMed, Ovid Medline, CINAHL) was used to search for original research studies on tailored educational interventions in HF patients. Key search terms included “heart failure,” “health literacy,” “video-based education, self-care, and “patient education”. The year and dates of publication were not limited. Articles with an abstract in English were reviewed. The search yielded 272 studies to be included for review.

For the gray literature, a comprehensive search was performed using Google Scholar to review articles, reports, and guidelines published by national organizations. The search was performed to find additional literature involving the assessment of health literacy and video education in HF patients. Literature that was written in English was reviewed and the search was not limited to year publication. Search terms that were used are the aforementioned search terms. The search yielded three results to be included for review.

Methodology of Literature Review

The search strategy resulted in 128 English, nonduplicate articles that were added to a database. Articles that were screened through title and specific to HF patients were advanced to the next level. The next stage of article selection constituted abstract evaluation and search for

relevant information. Articles that did not meet the inclusion criteria pertaining to the focus of the review were not included. All other articles proceeding to the next stage of assessment were obtained in full text format. Abstracts that were available in full-text were read in full and determined for inclusion based on qualifying criteria. Inclusion criteria were target population to HF patients, health literacy screening and VBE in the HF population, studies published only in English, and outcome measures related to self-care behaviors and HF knowledge. Original research studies or systematic reviews in peer-reviewed journals that examined health literacy in adult HF patients (18 years or older) and educational interventions specific to this population were also included.

Articles that examined the assessment of health literacy or video education in other cardiovascular conditions such as; hypertension, myocardial infarction, or cardiomyopathy were not included. Exclusion criteria were target population that was not diagnosed with HF, Non-English studies if the study intervention did not involve the assessment of health literacy, use of video education, or if outcome measures did not relate to self-management and HF knowledge. Studies that were considered non-experimental or non-research were not excluded. There were no imposed limitations on the year or publication date. After applying the exclusion criteria, 10 studies were remaining. Of these, three quantitative studies and seven qualitative studies were included for the synthesis of evidence. The number of articles identified and selected at each stage is summarized in Figure 1.

Synthesis of Evidence

After the initial literature search, application of inclusion criteria, and completing the study selection process, 10 articles were accepted for qualitative and quantitative synthesis of

evidence for this review. The study design of the selected articles consisted of four randomized controlled trials (RCT) (Albert et al., 2007; Moser et al., 2015; Veroff et al., 2012, Tsuyuki et al., 2019), two systematic reviews (Cajita, Cajita, Han, 2016; Evangelista 2010), one pilot study (Chen et al., 2011), one non-experimental descriptive study (Fabbri et al., 2018), and two clinical HF reports (Bos-Touwen et al, 2015; Westlake, Sethares, Davidson, 2015). The selection of studies presented identified or assessed health literacy in HF patients or included interventions using VBE that are deemed effective in HF populations. These studies also identified the importance of acknowledging the epidemiology, prevalence, and mortality rate of HF patients. A description of the included studies with information about the study design, study sample, study outcomes, limitations, and level of evidence is presented in Table 1.

Impact of health literacy on heart failure management and health outcomes. There were consistent reports across all studies regarding the use of health literacy screening or identification in adult HF patients. Moser et al. (2015) conducted a randomized controlled trial of an education intervention and baseline screening for health literacy using the 36 item, Short Test of Functional Health Literacy in Adults (S-TOFHLA) measurement tool. This study included 575 hospitalized adult HF patients and examined the association of health literacy with poor health outcomes. Screening for health literacy in this study revealed that out of the 249 HF readmissions, there were significantly more in the inadequate (40%) and marginal (34.4%) health literacy groups than in the adequate (29.9%) health literacy group with a p-value of .001. Interestingly, low health literacy was associated with patients who were older, male, less educated, and unemployed. Sixty-three deaths from all causes occurred during the study period and there were almost twice as many deaths in the inadequate and marginal health literacy

groups. Participants with adequate health literacy were more likely to have increased self-care abilities and reduced hospitalizations.

A pilot study by Chen et al. (2011) examined the relationship between health literacy and self-care of adult HF patients. Participants were recruited from a variety of Midwestern community settings in the U.S., including two HF clinics (one rural, one urban), a cardiology practice, two continuing-care retirement communities, and a community hospital. Participants were screened for health literacy level using the S-TOFHLA measurement tool, the Self-Care of Heart Failure Index, version four, was used to measure self-care abilities, and a demographic questionnaire. There were 49 participants included in the study. Health literacy positively related to self-care maintenance (0.357, $p=0.006$), negatively related to self-care management (-0.573, $p=0.001$), and there was no association between health literacy and self-care confidence (0.201, $p=0.083$) respectively. Findings that were important for clinical implication in the provision of patient care is that higher health literacy was related to greater performance in self-care and self-maintenance.

Evangelista et al. (2010), a systematic review and expert nursing consensus statement evaluated research on the current issues related to health literacy in HF patients. The article introduced a five-step approach for healthcare providers to address health literacy which includes; recognizing health literacy, identifying patients at risk, formally screening patients at risk, documenting low health literacy levels, and integrating strategies to enhance health understanding (Evangelista et al., 2010). The study identified four cross-sectional studies and three interventional trials that evaluated health literacy and its impact on health outcomes and health literacy interventions in HF. It was revealed in a study that low and marginal health literacy was significantly associated with misunderstanding medication labels, with only 35% of

those with low health literacy able to indicate correctly how many pills need to be taken daily (Evangelista et al., 2010). Other cross-sectional studies included also reinforced the connection between low literacy and incorrect medication use (Evangelista et al., 2010).

Furthermore, limited health literacy in HF patients was positively associated with decreased knowledge of one's medical condition, poor medication recall, poor self-care behaviors, nonadherence to treatment plans, increased mortality, and hospitalizations (Evangelista et al., 2010). Findings also suggested that health literacy screening is a pivotal step in addressing gaps in self-management practices in HF patients. Timely recognition of low health literacy combined with tailored interventions should be integrated into clinical practice (Evangelista et al., 2010). Strategies aimed to assist patient understanding in health care settings need to focus on communication, sharing appropriate educational information, and assessing materials for readability (Evangelista et al., 2010).

The systematic review by Cajita, Cajita, Han (2016) emphasized that health literacy can potentially affect the performance of HF self-care behaviors and other HF outcomes. Twenty-three studies were evaluated which included articles rated as good to high-quality studies. A majority of the studies revealed that the prevalence of low health literacy among HF patients ranged from 17.5% to 97% with an average of 39% of the study participants found to have low health literacy. The S-TOFHLA was the most commonly used health literacy measurement tool. Four studies that used the SCHFI revealed that demographic characteristics such as; African American, Hispanic, and low-income level were predictors of low health literacy.

The descriptive study, by Fabbri et al. (2018) utilized a survey packet to assess health literacy using a three-question brief screener and to identify socio-behavioral components. The study revealed that low health literacy is associated with decreased HF knowledge and increased

mortality rate and in HF patients. These populations along with having low educational level can be a predictor for those with low health literacy. Bos-Touwen et al. (2015), a HF clinical report, states that health care providers should consider initial health literacy screening in HF patients with predictors such as low education level or low socioeconomic status to tailor education and improve self-management support. Westlake, Sethares & Davidson (2013) reported that the relationships between health literacy and health outcomes are multifaceted due to the complexity of care needs in HF patients with diminished health literacy.

Impact of video-based education on improving HF self-management. There were two RCT studies found that examined the effects of a video-based education intervention on improving self-care in HF patients. The randomized controlled trial by Albert et al. (2007) study related that using a home video guide to self-care for hospitalized HF patients could improve overall self-care behaviors and increase HF knowledge. In the results, there was a significant change noted in the intervention group ($p < .04$) concerning fatigue and edema. Of those in the intervention group, the video offered new information, clarified information already learned, and prompted 21% of viewers to change lifestyle behaviors respectively. Results of the interventional video education group were statistically significant and show better adherence to HF recommendations and treatment plans ($p < .05$). The randomized controlled trial by Veroff et al., (2012) assessed the financial impact of educational videos for adult subjects with chronic HF. The study utilized a 29 DVD format decision aid video and a 38-page booklet to improve care processes and outcomes. For the intervention group, video education improved self-care behaviors and maintenance ($p < .05$).

Impact of video-based education on improving HF knowledge. The RCT by Tsuyuki et al. (2019) developed a Congestive Heart Failure Outreach Program using a 20-minute video-

based educational intervention, supplementary booklet, and three bi monthly newsletters focusing on salt and fluid restriction, daily weights, and medications. There were 539 recruited participants from 22 hospitals and outpatient centers in Canada and the United States. There was a statistically significant average increase in the intervention group in HF knowledge scores assessed at six months ($p=0.024$). There was no difference between the intervention group (21%) and the control group (23%, $p=0.66$) in decreasing HF-related hospitalizations.

Summary of the Literature Review

There are limited intervention trials that examined the effectiveness of individualized educational strategies to improve HF self-management skills or HF knowledge among patients with low health literacy. Patients with higher health literacy levels indicated a higher rate of adherence and a lower rate of HF-related readmissions. Furthermore, the studies indicated that people who recorded low health literacy levels were the majority and accounted for the highest cases of HF-related readmissions and emergency visits. Failure to address health literacy in patients with HF will compromise the effective implementation of medical care and device therapies (Evangelista et al., 2010). Adequate patient communication is crucial, and it becomes more so when patients suffer from low health literacy (Evangelista et al., 2010). Self-care practices and the use of health care resources may be diminished in patients identified with marginal or low health literacy.

Limited health literacy in HF patients is associated with low levels of knowledge about HF, poor self-care, poor adherence to medication regimens, less self-efficacy, and frequent hospitalizations (Moser et al., 2015). Prevailing evidence indicates that most HF patient education materials in hospitals and clinics, owing to lack of understandability, are not sufficient for HF patients with low or marginal health literacy (Moser et al., 2015). Health literacy

screening in HF patients may also reveal limited literacy predictors according to patient demographics such as; low socioeconomic status, low educational level, or unemployed. Tailored education according to health literacy level may be necessary to improve self-care behaviors in patients with HF (Chen et al., 2011).

There are limited studies regarding the use of video-based education in HF patients within primary care or outpatient settings. Strategies that are helpful for HF patients with limited health literacy include frequent use of oral and visual instructions, such as videos, pictographs; limiting instructions to essential information only; making instructions interactive; and including patient and family, friends, and significant others in the discussion (Evangelista et al., 2010). Videos, pictures, diagram-based learning, or online modules should also be considered for those with significant literacy deficits (Evangelista et al., 2010). In 2007, Albert et al., (2007) concluded that VBE is understudied. Since that time, significant research progress has still not been made. The provision of video-based education has been proven to increase HF knowledge, self-management behaviors, and adherence to treatment regimens. The quality of existing evidence for patient education interventions using video-based education still poses as a gap in the literature due to a lack of high-quality study research. The recommendation is that there is a need for further research to be conducted to provide clear information and guidelines to provide patient-specific and literacy-sensitive educational interventions in HF populations.

Theoretical Framework

In 2008, the situation-specific theory of heart failure self-care (See Figure 2) was first published to support research studies targeting adults with chronic HF (Riegel, Dickson, Faulkner, 2016). The theoretical framework applies to the project given that it addresses self-care and HF knowledge, which are the outcomes that were measured in the project. Knowledge refers

to the relevant information that one can recall from memory and previously learned material (Riegel, Dickson, & Faulkner, 2016). The theory entails three separate but linked concepts that reflect the processes that often are mastered in sequence. The first self-care concept is *maintenance*. This process addresses the importance of choosing healthy behaviors and adhering to treatment. For instance, a patient that participates in daily exercise programs takes medications as prescribed by their provider, and follows a sodium-restricted diet is aware of an integral part of effective self-care management in HF, and maintaining their health.

The second self-care concept is *symptom perception*, which entails the detection of physical sensations and the interpretation of meaning (Riegel et al., 2016). Specifically, it involves body listening, monitoring signs, recognition, interpretation, and labeling symptoms (Riegel et al., 2016). For example, HF patients who acquire symptom perception will realize that shoes or a ring feeling tighter in size compared to the previous week can interpret that as symptoms of edema or weight gain. The third self-care concept, *management*, is the response to symptoms when they occur (Riegel, Dickson, Faulkner, 2016). A patient with HF who recognizes new signs and symptoms of worsening such as; increased shortness of breath, exercise intolerance, and a five-pound weight gain in one week will promptly notify their health care provider to prevent further health complications.

The theory also emphasizes that the decision-making process exerts a strong influence on each of the self-care processes of maintenance, symptom perception, and management (Riegel, et al., 2016). The manner in which self-care decisions made by patients with HF are influenced by the decision-making elements of a person, problem, and the environment is described while acknowledging how these decisions are influenced by knowledge, skills, experience, and values (Riegel et al, 2016). Therefore, personal or societal factors such as; inadequate health literacy,

low socioeconomic status, and living in rural areas can influence self-care behaviors and the perception of HF. The decision-making process to HF self-care essentially determines a patient's level of understanding HF and being able to make appropriate self-management decisions. Providers need to identify all factors that may hinder optimal health care and address specific personal or societal issues that may prevent disease management. Health literacy screening can identify those who possess inadequate or marginal health literacy and aid in determining whose decision-making abilities or knowledge of HF needs improvement. Providing VBE can serve as a valuable educational method that may enhance HF knowledge and self-care behaviors.

Purpose of Present Project

Studies that evaluated the impact of health literacy on HF patients showed that low health literacy was associated with increased hospitalizations, poor medication adherence, and higher morbidity and mortality rates. Health literacy screening in HF patients can serve as a tool to provide early identification of patients who are at a higher risk of developing poor health outcomes. VBE was shown to be effective in improving self-care (Albert et al., 2007) and HF knowledge (Tsuyuki et al., 2019). Utilizing video-based education can serve as an alternative method to improve care management in HF patients receiving care in an outpatient setting. However, using these educational interventions can be used while maintaining a tailored and patient-centered approach.

Study Question

In adult HF patients, how does the provision of VBE counseling improve HF self-management and knowledge?

Is there a significant difference between adequate and limited health literacy groups in developing HF self-management and knowledge after receiving VBE counseling?

Methods

Introduction

The goal of this project was to integrate health literacy screening and the provision of VBE counseling for HF patients and evaluate changes in HF knowledge and self-management. The examination of significant differences between adequate and limited health literacy group was evaluated after receiving VBE counseling. The project used an individualized approach by identifying the HF patient's highest learning needs for disease management and delivering patient education in a counseling format. This project contributed to the gaps in the literature on the use of a tailored educational intervention according to health literacy level and VBE amongst adult HF patients in outpatient settings.

Research Design

A one-group pretest-posttest design was used to evaluate the effectiveness of VBE counseling on improving self-management and HF knowledge in HF patients.

Research Questions

In adult HF patients, how does the provision of VBE counseling improve HF self-management and knowledge in an outpatient setting?

Is there a significant difference between adequate and limited health literacy groups in developing HF self-management and knowledge after receiving VBE counseling?

Definition of Terms:

Evidence-based practice: The delivery of the highest quality of healthcare by using a problem-solving approach to incorporate the best evidence from well-designed studies and ensuring the best patient outcomes at the lowest costs (Melnyk, Fineout-Overholt, 2015).

Heart Failure: A progressive disease in which the heart's muscle gets injured from conditions such as; high blood pressure or a heart attack and gradually loses its ability to pump enough blood to supply the body's needs (Yancey et al., 2013).

Heart Failure Clinic: A disease management program in which service is provided in an outpatient setting where patients come to receive care from health practitioners with expertise in heart failure (Lindenfield et al., 2010).

Heart Failure Knowledge: The relevant information that one is able to recall from memory and previously learned material pertaining to heart failure (Riegel, Dickson, & Faulkner, 2016).

Health Literacy: The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (Evangelista et al, 2010).

Limited health literacy: Individuals with low or marginal capacity to obtain, process, communicate, and understand basic health information and services to make appropriate health decisions.

Self-care: A natural decision-making process that influences actions that maintain physiologic stability, facilitate the perception of symptoms, and direct the management of those symptoms (Riegel, Dickson, & Faulkner, 2016).

Usual Heart Failure Education: Oral or written education delivered by providers or nurses that consists of a 1-hour discussion of HF education during a patient appointment.

Video-based education: The use of audio-visual recording technology that enables learners to explore and expand their knowledge while at the same time expressing their opinion in the target language (Wang, 2010).

Video-based education counseling: The provision of individualized, 15-30-minute face-to-face VBE counseling sessions and/or telephone consultations according to a patient's health literacy level and highest learning needs for disease self-management. The health care professional delivers patient education by providing assistance and guidance for the patient (via telephone or face-to-face) to achieve focused learning through videos. The healthcare professional recommends specific video topics based on patient highest learning needs such as; medication adherence or sodium restriction and facilitates post-VBE discussions to guide the patient in incorporating strategies to improve self-management skills in daily life. Collaboration with the patient's advanced practice provider or physician and patient follow-up is necessary to identify areas for improvement in lifestyle behaviors and to remain consistent with the active treatment plan.

Setting

This project was conducted at two outpatient heart and vascular clinics located in Central Virginia. Participant recruitment, enrollment, and implementation of the intervention took place at each HF Clinic to reach the desired population. Each HF clinic offers access to comprehensive cardiac care and disease management to HF patients residing in the 13 localities of central, urban, or rural areas of Virginia. The volume of patients seen by an advanced practice

provider at clinic one is approximately 3,000 patients per year (approximately 250 patients per month). The volume of patients seen by an advanced practice provider at clinic two is approximately 2,400 patients per year (approximately 200 patients per month). The patient population comprises of African Americans, Hispanics, Asians, and predominantly Caucasians. Each clinic provides HF management for those who are frequently admitted to the hospital, requires comprehensive HF management, or evaluation of health status post-hospitalization. Other services include assistance with HF lifestyle or behavioral changes such as; monitoring salt and fluid intake; assessing response to medication therapy, treating HF patients with a heart device, or providing home-health heart care to those within a 60-mile radius of the clinic. The project was assisted by two nurse practitioners with expertise in HF who ensured clinical resources, access to necessary data, clinic awareness of the project, and participant recommendations. Collaborating health professionals included nurse practitioners, nurses, and physicians.

Sample

A convenience sample meeting the following criteria for enrollment was recruited for the project: adult patients 18 years or older diagnosed with class I, II, III, or IV HF classified by the New York Heart Association (NYHA) or stage A, B, C, or D HF classified by the American College of Cardiology/American Heart Association, patients receiving care at either of the HF clinics who resides in Virginia, patients with home internet access via personal computer, tablet, or smartphone, and patients with limited or adequate health literacy. Patients were excluded from the project if diagnosed with cognitive impairment (Dementia, Alzheimer's disease, intellectual disabilities), unable to read or write in English, lack of consistent internet access at home, or legally blind.

Measures

The Short Test of Functional Health Literacy in Adults (S-TOFHLA). The S-TOFHLA is a 7-minute, 36-item measurement tool that was used to measure health literacy (See Appendix D). The instrument is a functional literacy assessment tool designed to evaluate adult literacy, numeracy, and reading comprehension that is necessary to understand and negotiate the health care system adequately (Baker, 2006). The S-TOFHLA has been documented as a practical measure of functional health literacy with good reliability and validity that can be used by health educators to identify individuals who require special assistance to achieve learning goals (Baker et al., 2006). It is commonly used in several research studies involving health literacy in those with chronic diseases such as, diabetes and HF in clinical or educational settings. The test is also printed in 14-point font, large print to accommodate patients with visual acuity at least 20/50. One point is given towards the final score for each correctly marked answer.

For reading comprehension, the instrument tests the patient's ability to read passages using real materials from the health care setting (U.S. General Services Administration, 2006). The 36-item instrument uses a modified Cloze procedure and the reading passages are selected from instructions for preparation for an evaluation study, e.g. X-ray, upper GI series, and the patient rights and responsibilities section of a Medicaid application form (U.S. General Services Administration, 2006). The reading passages also increase in difficulty by the end of the screening test. Functional health literacy levels are categorized as inadequate functional health literacy, marginal functional health literacy, and adequate functional health literacy.

Patients who have adequate health literacy received a score between 23-36 points, which indicates that the patient can read and interpret most health texts. Patients who have marginal

health literacy received a total score between 17-22 points, which indicates that the patient has difficulty reading and interpreting health texts. Patients with inadequate health literacy received a score between 0-16 points, which indicates that the patient is unable to read and interpret health texts. Individuals who score as marginal or inadequate health literacy will not be able to understand directions for their health care. In fact, they are likely to take their medications incorrectly or fail to follow prescribed diets or treatment regimens (Baker et al., 2006). The tool also suggests that when a patient is identified as having low or marginal health literacy, health care providers should make modifications to the treatment or education plan to accommodate these individuals.

The Self-care of Heart Failure Index v.7.2 (SCHFI). The SCHFI version 7.2, is a 39-item measurement tool that was used to measure HF self-care (See Appendix E). The newly revised instrument comprises of four scales measuring self-care maintenance, self-care management, symptom perception, and self-care confidence. The SCHFI is supported for its internal consistency, validity, and test-retest reliability (Riegel et al., 2019). It has also been frequently utilized for many research studies since it was published in 2008. The use of SCHFI has been cited in 911 studies and a variety of them reveals how self-care behaviors can improve outcomes, including quality of life (Riegel et al., 2019). The self-care concepts emphasized in this measurement tool are also congruent with the situation-specific theory of heart failure self-care. The instrument uses Likert-type response questions for each measurement scale divided into four sections labeled section A through D. The Self-Care Maintenance scale (Section A) includes 10 questions related to treatment adherence and healthy behaviors measured in terms of frequency (1 = never to 5 = always) (Riegel et al., 2019). The Symptom Perception scale (Section B) includes 8 items assessing frequency of behaviors (1 = never to 5 = always) and 2

items on how quickly symptoms were recognized and identified as HF (0 = I did not recognize the symptom to 5 = very quickly) (Riegel et al., 2019). Specifically, symptom perception involves body listening, monitoring signs, as well as recognition, interpretation of meaning (Riegel et al., 2019).

The Self-Care Management scale (Section C) includes eight questions that ask about how likely a patient will respond to symptoms when they occur with response options ranging from 1 (not likely) to 5 (very likely) (Riegel et al., 2019). The Self-Care Confidence scale (Section D) includes 10 questions that assess how confident the patient is in managing their HF and following treatment plans even when difficult with response options ranging from 1 (not confident) to 5 (extremely confident). Although this scale is not considered to be a part of self-care, it is a process that moderates the relationship between self-care and outcomes. The scales are measured scored separately and the response choices are summed up to achieve a possible score of 0 to 100, with higher scores indicating better HF self-management. The SCHFI is highly advocated and supported for its use in clinical practice or research.

The Atlanta Heart Failure Knowledge Test (AHFKT). The AHFKT is a 30-item measurement tool that was used to measure HF knowledge and to identify patient understanding and deficits (See Appendix F). The instrument is a useful tool to assess both patient and family member HF knowledge with demonstrated acceptable psychometric properties (Reilly et al., 2009). The choice items contain of two questions concerning pathophysiology, twelve questions concerning nutrition, six questions regarding behaviors, four questions regarding symptom management, and six questions regarding medications (Butts et al., 2018). Patients with higher scores out of 30 questions indicate higher HF knowledge. The AHFKT has been utilized in multiple HF studies for its reliability and validity. A recent systematic review of knowledge

measures suggested that the AHFKT might be the most appropriate measure for assessing HF knowledge (Butts et al., 2009). HF nursing experts report excellent content validity and readability. Furthermore, the content validity ratings on relevance and clarity ranged from .55 to 1.0 with 81% of the items rated .88-1.0 (Reilly et al., 2009). Construct validity also demonstrated the correlation of knowledge with clinical self-care outcomes including dietary sodium consumption, medication adherence, and health care utilization (Reilly et al., 2009). In research, the AHFKT assessment in a pretest and posttest design can evaluate nursing interventions directed toward improving patient HF knowledge and self-care behaviors in clinical practice and research (Butts et al., 2018).

Demographic and clinical data. The demographic data collected includes age, race, gender, level of education, employment status, marital status, and income (See Appendix K). The clinical data that was collected includes the NYHA HF functional class or ACC/AHA stage of HF, type of HF, ejection fraction percentage, and other medical comorbidities (See Appendix K). The NYHA functional classification is a guideline to classify the extent or severity of HF. The classification is as follows: Class I HF indicates that the patient has no symptoms or functional limitations, e.g. shortness of breath when walking or climbing stairs (AHA, 2019). Class II HF will reveal mild symptoms and slight limitation during ordinary activity such as chest pain or shortness of breath (AHA, 2019). Class III HF will reveal marked functional limitations and less than ordinary activity leads to symptoms, e.g. shortness of breath when walking short distances and comfortable only at rest (AHA, 2019). Lastly, class IV is the most severe form of HF. There are severe functional limitations and discomfort with any physical activity and symptoms are present even at rest (AHA, 2019).

The two types of HF are systolic HF and diastolic HF. HF with reduced ejection fraction (HFrEF) or systolic HF occurs when the left ventricle of the heart loses its ability to contract normally (AHA, 2017). This causes the heart to pump with inadequate force and push an insufficient amount of blood circulation into the body. In contrast, HF with preserved ejection fraction (HFpEF) or diastolic HF occurs when the left ventricle of the heart loses its ability to relax normally because the muscle has become stiff (AHA, 2017). This causes the heart to fill with blood inadequately during the resting period between each beat (AHA, 2017). The ejection fraction (EF) of the heart is a measurement, expressed as a percentage, of how much blood the left ventricle pumps out with each contraction (AHA, 2017). A normal EF of the heart should be between 50-70% however, a normal EF could be present in HF (AHA, 2017).

Procedures

Pre-intervention and recruitment. The principal investigator formulated a PowerPoint presentation (See Appendix L) of the project to present to staff members at each outpatient HF clinic and established willing project facilitators to gain access to the desired population. The project objectives and project goals were discussed via in-service presentation meetings or mass emails to increase clinic awareness of the project. The principal investigator and practice mentors at each clinic facilitated recruitment by placing recruitment flyers in patient examination rooms, waiting rooms, and conference rooms. The recruitment flyer also included the principal investigator's contact information such as; name, phone number, and email address (See Appendix G). The principal investigator received assistance in recruiting and patient recommendations from one practice mentor, a DNP advisor, two Registered Nurses, and a Physician. An inclusion and exclusion sheet was used by the principal investigator to maintain project fidelity and to ensure that the target population was reached (See Appendix H). Interested

patients were encouraged to contact the principal investigator, at which a further explanation about the project was given. Efforts were made to adhere to ethical considerations for all patients. With guidance from a practice mentor, the principal investigator approached patients with appointments at the clinic two to three days per week for four to six hours per day. Clinic practice mentors and the principal investigator collectively informed patients about the project.

All HF patients meeting eligibility criteria during the recruitment period were enrolled for the project. All eligible patients who enrolled received a recruitment information sheet (See Appendix I) and written informed consent were obtained (See Appendix J). The principal investigator utilized a consulting room or an unoccupied patient examination room to enroll patients and verbally discuss the process and duration of the project. The principal investigator provided participants with contact information if they should have further questions or concerns about the project. Participants were informed that they had the option to opt-out of the project at any time. With patients' consent, demographic and clinical data relevant to the study, email addresses, and contact number was collected. S-TOFHLA scores, baseline SCHFI and AHFKT scores were obtained from each participant. Patient charts at each HF clinic were also accessed and reviewed by the principal investigator to verify reported clinical data that was collected from each participant.

Intervention. The videos for HF are located on the University of Virginia Health System: Online Patient Education Library. The online library provides a collection of video education topics for cardiovascular diseases including HF. It is developed in partnership with the American Heart Association, the American Stroke Association, and The Wellness Network to empower patients and improve quality of life. Each video is viewable with a transcript in English and Spanish. The video library is easy to navigate and may be viewed on a smartphone,

tablet, or personal computer. Each patient had free access to 31 HF videos that are delivered with actual patient scenarios and evidence-based guidelines.

The HF video content is grouped into two sections which are *Heart Failure Basics* and *Heart Failure Lifestyle Changes* (See Appendix M). The *Heart Failure Basics* section comprises of 20 videos ranging from 2-6 minutes per video. The videos address HF overview topics such as; the diagnosis of HF, monitoring symptoms of HF, medications used for HF, managing HF medications, common tests for HF, warning signs of HF, home care management for HF, HF treatment plan, managing HF flare-ups, preparing for patient appointments, building a support network, and emotions of HF. The *HF Lifestyle Changes* section comprises 13 videos ranging from 3-7 minutes per video. This section of videos addresses topics such as; strategies to reduce sodium intake, adhering to a heart-healthy diet, reading nutrition labels, fluid guidelines, interpretation of HF diagnosis, exercising safely, avoiding HF readmissions, and establishing future health goals. All patients were informed or directed to watch the HF interpretation and diagnosis videos first and encouraged to use the HF self-care check sheet also provided online. The videos are suitable to be administered within an outpatient setting or at home because of the easy access, convenience, and duration of videos.

All participants were enrolled for individualized weekly support consisting of health literacy screening, a VBE brochure to gain access to online videos, VBE tracking log for note-taking and marking down completed videos, take notes and mark down videos completely watched, 15-30 minute face-to-face counseling sessions or telephone consultations per patient request, and post-session or consultation follow-up via telephone. The implementation period for the project and follow-up was six weeks. Participants received an informative HF VBE brochure that provided information about the purpose of VBE and its use in HF education, how to access

the online patient education video library, website navigation, and recommended HF videos to watch (See Appendix N). A video tracking log was also provided to supplement the brochure and assist the participants in documenting each video completely watched (See Appendix O).

Each participant was encouraged to watch at least three to five HF videos per week specifically tailored to the patient's highest learning needs (e.g. fluid guidelines, medication adherence, sodium restriction, or weight management) and the principal investigator's recommendations. Participants were encouraged to watch the two videos about HF interpretation and diagnosis first, followed by a provider recommended video. Participants had the opportunity to view the HF videos during an educational session held after patient appointments with a healthcare provider or in the comfort of their own home. Those with low or marginal health literacy were highly encouraged to opt-in for face-to-face education counseling sessions. Participants who opted-in for telephone consultations were advised to watch their recommended videos at home and received a phone consultation by the principal investigator to discuss the video topic further. The principal investigator made weekly arrangements to use clinic consulting rooms or unoccupied patient examination rooms for the individual face-to-face counseling sessions. A personal tablet or a clinic owned tablet was used to gain access to the videos during the individualized VBE sessions at the clinic. The principal investigator contacted the participants to schedule the best day and time to discuss video content and learning needs via counseling session or telephone consultation per week. Providing face-to-face counseling sessions also reduced participant barriers to watching the videos and participating in the project.

Before the VBE counseling sessions, the principal investigator reviewed patient charts and collaborated with the HF provider to discuss the participant's treatment plan and identify HF education topics to address. The principal investigator scheduled the counseling sessions after

patient appointments for 15-30 minutes while reviewing three HF videos per patient. Participants received self-management counseling and recommendations on which videos to watch based on their individual learning needs. The VBE sessions also facilitated tailored education counseling by recommending specific HF videos and discussing pertinent HF management tips. Scheduling the individualized VBE sessions after patient appointments was an attempt to make the sessions easily accessible and convenient for the participants. Post-VBE discussions were also held to guide the participants to think about effective strategies they could use to modify or improve their HF self-management based on the video that was reviewed.

Additional recommendations were given to each participant based on the provider's and principal investigator's collaboration. The principal investigator encouraged participants to ask questions before the end of the session and scheduled telephone follow-up appointments per patient. Telephone consultations were delivered to patients who preferred to interact with a healthcare professional by phone due to transportation issues or convenience. Participants were asked which videos and the amount they have watched (VBE regimen of three to five videos per week) on their own before the telephone consultation with the principal investigator. Participants were also allowed to watch the videos during the telephone consultation. The principal investigator facilitated post-VBE discussions and encouraged the participants to ask questions regarding the video content. Assistance with formulating effective strategies to improve HF self-management, video topic recommendations, and the next follow-up was discussed before ending the telephone consultations. To maintain project fidelity and organization of project procedures, the principal investigator utilized a three-phase intervention guide as the project protocol (See Figure 3).

For the follow-up period, weekly telephone calls were conducted by the principal investigator to identify patient issues with viewing the videos or discussing video content. Follow-up appointments were scheduled based on patient preferences of day and time. Participants were also provided with reminders for telephone follow-up via text message or email to maintain regular contact. Each participant was encouraged to provide feedback regarding the project and their perspectives on using VBE for HF. The principal investigator used a journal to take notes of participants reported improvements with self-management or knowledge. The weekly telephone follow-ups were also an attempt to empower patients and encourage participation. Participants were notified that the principal investigator would be available to direct educational sessions after their next scheduled patient appointment or available day and time at the clinic. Participants were also made aware of availability for telephone consultations.

Post-intervention. The post-intervention evaluation period began immediately after the six weeks of the individualized weekly support intervention. The participants were informed to complete the SCHFI and the AHFKT questionnaire and report any issues or difficulties with watching the videos. Participants had the opportunity to complete their post-evaluation in-person at the HF clinic or via telephone. All results of the questionnaires were kept secure and results were in a password-protected database. Participants were able to keep their VBE brochure as a resource to access the HF videos and the entire patient education video library website for future reference. Patients were informed to utilize the patient video education website in addition to the education they receive by their other health care providers.

Protection of Human Subjects

The Doctor of Nursing Practice (DNP) scholarly project was submitted to the University of Virginia's Institutional Review Board (IRB) for approval before implementation. The principal investigator obtained written informed consent from all enrolled participants and informed them of the purpose of the project. Participants were given a project information sheet and a copy of the consent form and encouraged to voice any questions or concerns of the project. Participants were made aware of the data collection process (e.g. what data will be collected, how will the data be collected, and how will the data be used), risks and benefits of the project, potential inconvenience, and the duration of the project. Moreover, participants were informed of their right to withdraw from participating in the project. Patients were informed that withdrawing from the project would not affect the current care they receive at the clinic.

The principal investigator completed the required IRB-HSR course for confidentiality prior to implementation of the project and scholarly project defense. Patient identifiers were de-identified from all collected data and stored in the University of Virginia's data storage system. Any written documents produced by the project are locked in a file cabinet to protect patient information. The data collected are only accessible to the involving members of the project such as; the DNP advisor, the principal investigator, and the statistician. Institutional and IRB policies were followed and any unintended adverse effects were reported to the IRB. In conclusion, the project is of minimal risk to participants due to the utilization of an educational intervention. During implementation, the principal investigator was involved with repeated weekly monitoring of the participants to detect any needed clarifications or concerns. The cumulative analysis and

findings are reported. The risk of physical harm and adverse health outcomes were not anticipated with this project.

Data Collection

Project data was collected from November 6, 2019, to December 20, 2019. The primary person responsible for the data collection was the principal investigator.

Data Analysis

The project data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 25. The principal investigator received assistance from the team statistician to facilitate the data analysis process. Descriptive statistics for demographics, health literacy level, and clinical data were analyzed and reported as frequencies, standard deviations, means, medians, interquartile ranges (IQR), and percentages. For data sets having fewer than six participants, the IQR was not calculated. To determine statistical significance, a two-sided p -value of $< .05$ was used. The Wilcoxon Signed Rank Test and the Paired-Samples T-test was used to analyze changes in pre-test and post-test scores of the primary outcome measures: HF knowledge, self-care maintenance, self-care symptom perception, self-care management, and self-care confidence. The Wilcoxon Signed Rank Test was also used to determine if the average differences between the pre-intervention and post-intervention scores were statistically significant within the group due to a small sample size and non-normally distributed data. However, the results of Shapiro-Wilk tests for normality indicated that performing Paired-Samples T-tests for the outcomes of self-care maintenance and self-care confidence was appropriate.

The Mann-Whitney U-test was used to determine the differences in pre-post test scores of the primary outcome measures between adequate and limited health literacy groups. To use the Mann-Whitney U test, categorical variables in health literacy groups were combined (low and marginal) due to small frequencies so that there would be two categories for the variable. The Mann-Whitney U-test was also used to determine whether there are statistically significant differences in the pre-test and post-test scores of the health literacy groups.

Results

This chapter presents the results of the primary outcome measures and the data analysis of the project. Demographics are described and key findings are highlighted. The project was conducted by the following research questions: (1) In adult HF patients, how does the provision of VBE counseling improve HF self-management and knowledge in an outpatient setting? (2) Is there a significant difference between adequate and limited health literacy groups in improving HF self-management and knowledge after receiving VBE counseling?

Response Rate

Twenty-five HF patients were approached and assessed for project eligibility from November 6, 2019 to December 20, 2019. Ten patients were excluded from the project for the following reasons: declined to participate (3), cognitive impairment documented in EMR (5), lack of internet connection at home or no means of consistent transportation to the HF clinic per week for VBE sessions to accommodate for this barrier (2). Fifteen participants consented for the study but, five out of the fifteen participants did not complete all pre-implementation measures due to loss of contact/ could not be reached via telephone or email after consenting (2), traveling (2), admitted to a skilled nursing facility (1). Ten participants completed the study. Out of the ten participants, five participants were from HF clinic one and the other five participants were from HF clinic two. From the time of participant consent and completion of the study, there was a 66% (10/15) response rate and a 33% (5/15) attrition rate.

Sample Size and Demographics

For the 10 participants completing the study, the mean age was 55.90 (SD 14.64). The range in age was 37-79 years. Four (40%) participants were female and six (60%) participants were male; nine (90%) were White, and one (10%) was Black. For education level, two (20%) participants were high school graduates, four (40%) participants completed some college, and four (40%) were college graduates. Most patients were married (80%) and two (20%) were not married. Five (50%) participants were either retired or disabled, three (30%) were unemployed, two (20%) participants were employed. A majority of the participants earned an annual income of \$75,000 (5/50%), two (20%) participants earned an annual income between \$51,000 to \$74,000, and three (30%) participants earned an annual income of \$50,000 or less. A complete list of the participant characteristics is located in the tables section (See Table 3).

For clinical characteristics, a majority of the participants had NYHA Class III HF (70%), while only three (30%) participants had NYHA Class II HF. Eight (80%) participants of the population had systolic HF. Seven (70%) participants had HF with reduced EF with an EF of 40% or less, two (20%) participants had HF with preserved EF with an EF of 41-49%, and one (10%) participant had HF with preserved EF with an EF of 50% or more. For documented comorbidities, ten (100%) participants had a past medical history of hypertension and five (50%) participants were obese. Four (40%) participants had a past medical history of chronic kidney disease and two (20%) participants had a medical history of diabetes. A complete list of the clinical characteristics and comorbidities of the project participants is located in the tables section (See Table 4).

HF Knowledge

Results of the primary outcome measures for the ten participants who completed the study were evaluated (See Table 5). Pre-intervention scores ranged from 22 to 28 out of 30 with a mean score of 26.00 (SD = 1.88). Post-intervention scores of HF knowledge slightly increased with a range of 27 to 29 with a mean score of 28.00 (SD = 0.66). The median score of HF knowledge increased from pre-intervention ($Md = 26.50$) and post-intervention ($Md = 28.00$). Overall, the Wilcoxon Signed Rank Test revealed a statistically significant difference in pre-post intervention scores for HF knowledge (mean 2.0, SD = 2.10, $p = .011$, $r = 0.805$).

HF Self-Management

To evaluate the difference and statistical significance between pre-test and post-test scores in HF self-management, the Wilcoxon Signed Rank Test was used for self-care symptom perception and self-care management (See Table 5). To evaluate the difference between pre-post test scores in self-care maintenance and self-care confidence, the Paired-samples t-test was used based on the results of the Shapiro-Wilk assumptions for normality (self-care maintenance ($W = .953$, $df = 10$, $p = .700$) and self-care confidence ($W = .883$, $df = 10$, $p = .141$)).

Self-Care Maintenance. Total scores of pre-intervention self-care maintenance ranged from 40.00 to 97.50, with a mean of 75.00 (SD = 17.24) and post-intervention scores ranged from 55.00 to 100.00 with a mean score of 86.25 (SD = 17.89). A Paired-samples t-test analysis found a significant difference between pre-intervention and post-intervention scores ($M = 11.25$, $SD = 8.99$, $t(10) = 3.95$, $p = .003$ (two-tailed)). The scores were evaluated with a 95% confidence interval ranging from 4.82 to 17.68.

Self-Care Symptom Perception. Pre-intervention scores in symptom perception ranged from 19.57 to 100.00 and had a mean score of 77.82 (SD = 22.42). There was an increase in post-intervention scores ranging from 67.39 to 100.00 with a mean score of 90.21 (SD = 9.29). The median score on the symptom perception scale increased from pre-intervention ($Md = 82.61$) to post-intervention ($Md = 91.30$). The nonparametric Wilcoxon Signed-Rank Test revealed a statistically significant difference between pre-post intervention scores of self-care symptom perception ($Md = 13.04$, $M = 12.39$, $SD = 14.67$, $p = .021$, $r = 0.732$).

Self-Care Management. Pre-intervention scores in self-management ranged from 12.12 to 87.88 and had a mean score of 59.69 (SD = 21.71). Post-intervention scores increased ranging from 66.67 to 93.94 with a mean score of 78.18 (SD = 10.28). Mean scores in differences were 18.48 (SD = 14.24) and the median score was 15.15. The median score on the self-care management scale increased from pre-intervention ($Md = 65.15$) to post-intervention ($Md = 77.27$). A Wilcoxon Signed-Rank Test found a significant difference between pre-test and post-test intervention scores in self-care management ($p = .005$, $r = 0.888$).

Self-Care Confidence: Total scores of the pre-intervention self-care confidence scale ranged from 42.50 to 100.00, with a mean of 82.25 (SD = 17.89) and post-intervention scores ranging from 75.00 to 100.00 with a mean score of 91.25 (SD = 9.80). A Paired-samples t-test analysis found a significant difference between pre-intervention and post-intervention scores of self-care confidence (mean 9.0, SD = 10.15, $t(10) = 2.80$, $p = .021$ (two-tailed)). The scores were evaluated with a 95% confidence interval ranging from 1.74 to 16.26.

Differences in Health Literacy Groups

Results of the primary outcome measures between participants with adequate health literacy and limited health literacy were evaluated using the nonparametric Mann Whitney U exact test due to small sample sizes per group and a failed test of normality with a p-value less than .05 (See Table 6). Total health literacy scores ranged from 19 to 35 out of 36 with a mean score of 30.40 (SD = 7.26). Seven out of ten participants were classified as having adequate health literacy while the other three participants had limited health literacy.

HF Knowledge

For the seven participants with adequate health literacy, pre-intervention scores ranged from 24 to 28 out of 30 with a mean score of 26.71 (SD = 1.38) and a median score of 27. Post-intervention scores of HF knowledge increased with a range of 27 to 29 with a mean score of 28.00 (SD = 0.57) and a median score of 28. Pre-intervention scores in the limited health literacy group ranged from 22 to 26 with a mean score of 24.33 (SD = 2.08) and a median score of 25. Post-intervention scores increased ranging from 27 to 29 with a mean score of 28.00 (SD = 1.00) and a median of 28. A Mann-Whitney U test revealed no significant difference in HF knowledge scores of the adequate health literacy group ($Md = 1.0$) and the limited health literacy group ($Md = 2.0$). The mean score of the differences between the health literacy groups was 3.7 (SD = 2.88), $U = 3$, $p = .117$, $r = 0.556$.

Self-Care Maintenance

Pre-intervention scores for self-care maintenance in the adequate health literacy group ranged from 40.00 to 97.50 with a mean score of 71.07 (SD = 19.30) and a median score of 75. Post-intervention scores ranged from 55.00 to 100.00 with a mean score of 82.50 (SD = 13.77)

and a median score of 85. For the limited health literacy group, the pre-intervention scores in self-care maintenance ranged from 77.50 to 90.00 with a mean score of 84.16 (SD = 6.29) and a median score of 85. Post-intervention scores increased ranging from 90.00 to 100.00 with a mean score of 95.00 (SD = 5.00) and a median score of 95. A Mann-Whitney U test revealed no statistically significant difference in pre-test and post-test HF self-care maintenance for the adequate health literacy group ($Md = 10.00$) and the limited health literacy group ($Md = 10.00$). The mean score of the differences between the health literacy groups was 10.83 (SD = 6.29), $U = 10$, $p = 1.000$, $r = 0.037$.

Self-Care Symptom Perception

Total pre-intervention scores in symptom perception for the adequate health literacy group ranged from 19.57 to 100.00 with a mean score of 73.70 (SD = 26.09) and a median score of 78.26. Post-intervention scores increased ranging from 67.39 to 100.00 with a mean score of 87.88 (SD = 10.10) and a median of 89.13. In the limited health literacy group, pre-intervention scores for symptom perception ranged from 84.78 to 91.30 with a mean score of 87.68 (SD = 3.32) and a median score of 86.96. Post-intervention scores also increased ranging from 91.30 to 100.00 with a mean score of 95.65 (SD = 4.34) and a median of 95.65. Overall, a Mann-Whitney U test revealed no significant difference in HF symptom perception of the adequate health literacy group ($Md = 13.04$) and the limited health literacy group ($Md = 4.35$). The mean score of the differences was 7.97 (SD = 6.27), $U = 8.5$, $p = .667$, $r = 0.145$.

Self-Care Management

Pre-intervention scores in self-care management ranged from 12.12 to 84.85 with a mean score of 54.11 (SD = 22.97) and a median score of 54.56. Post-intervention scores increased

ranging from 63.64 to 93.94 with a mean score of 77.05 (SD = 10.48) and a median of 78.79.

Pre-intervention self-management scores in the limited health literacy group ranged from 63.64 to 87.88 with a mean score of 72.72 (SD = 13.21) and a median score of 66.67. Post-intervention scores ranged from 72.93 to 93.94 with a mean score of 80.80 (SD = 11.47) and a median of 75.76. A Mann-Whitney U test revealed that there was a statistically significant difference in HF self-management of the adequate health literacy group ($Md = 21.21$) and the limited health literacy group ($Md = 6.06$). The mean score of the differences is 8.08 (SD = 3.49), $U = 1.5$, $p = .033$, $r = .017$.

Self-Care Confidence

Total pre-intervention self-care confidence scores for the adequate health literacy group ranged from 42.50 to 97.50 with a mean score of 76.42 (SD = 18.42) and a median score of 80. Post-intervention scores increased ranging from 75.00 to 100.00 with a mean score of 89.28 (SD = 10.58) and a median score of 95. Pre-intervention self-care confidence scores for the limited health literacy group ranged from 90.00 to 100.00 ($M = 95.83$, SD = 5.20) and a median score of 97.50. Post-intervention scores slightly decreased for the minimum score ranging from 87.50 to 100.00 ($M = 95.83$, SD = 7.22) and a median score of 100. A Mann-Whitney U test revealed a statistically significant difference in self-care confidence between the adequate health literacy group ($Md = 10.00$) and limited health literacy group ($Md = .00$). The mean score of the differences was .00 (SD = 2.50), $U = .5$, $p = .017$, $r = 0.727$.

Discussion

Introduction

This chapter will present a summary review of the key project findings and interpretations; strengths and limitations, barriers to implementation, implications for nursing practice, education, policy, and future research. This project evaluated the effectiveness of assessing health literacy and tailoring VBE counseling to improve HF knowledge and self-management in an outpatient setting. The differences between adequate and limited health literacy groups in improving self-management behaviors and HF knowledge after receiving VBE counseling were also examined.

Interpretation of the Findings

The findings support and further illuminate results on the small body of evidence specific to the use of VBE and health literacy screening in the HF population. The key findings of this project indicate that VBE counseling is effective and may be considered an important adjunct to support HF self-management and knowledge. Participants started with a mean of 26 (87%) and achieved a post-intervention mean score of 28 (93%) in HF knowledge. The increase in HF knowledge from pre-test to post-test HF knowledge is similar to the findings of the VBE RCT study by Tsuyuki et al., 2019. This finding also supports the Evangelista et al., 2010 HF nursing consensus statement that emphasizes health literacy assessment and the use of videos for HF patients with literacy deficits. The significant difference in self-care maintenance suggests that the intervention may be beneficial for enhancing HF self-care behaviors, which should help prevent disease-related complications or illness, and improve well-being. Implementing VBE counseling and telephone consultations also indicated that it can improve HF symptom

perception; which showed a statistically significant change from pre-intervention (77.82) to post-intervention (90.21) scores. Furthermore, the ten participants had poor self-care management skills with a baseline average score of 59.69, and post-intervention achieved an average score of 78.18 out of 100. This increase in HF self-care management from pre-test to post-test is similar to prior studies (Albert et al., 2007; Veroff et al., 2012) that utilized VBE in HF patients. The outcomes of this project suggest that implementing tailored interventions such as VBE counseling can lead to improved disease self-management for HF patients.

These findings also align with the three self-care concepts of the Situation-Specific Theory of HF Self-Care: self-care management, maintenance, and symptom perception. The project findings suggest that the intervention can influence HF patients to develop the behaviors necessary to maintain physiologic stability, facilitate the perception of symptoms, and direct the management of the symptoms related to HF (e.g. shortness of breath, edema). Additionally, participants' self-care confidence scores had a nine-point increase from pre-intervention and post-intervention. This finding suggests that the use of patient education tools such as VBE within a self-management counseling program may empower individuals to take the necessary actions to achieve their healthcare goals.

Participants with adequate health literacy had an increase in HF knowledge with an average pre-intervention score of 89 and an average post-intervention score of 93. The limited health literacy group started with an average score of 81 for pre-intervention scores and 93 for post-intervention in HF knowledge. An encouraging key finding was that the limited health literacy group started with lower scores in knowledge but was able to achieve the same post-intervention score as the adequate health literacy group by the end of the project. Although HF knowledge was not significant between the health literacy groups, the increase in pre-post test

scores indicates that there is clinical relevance and the intervention may improve knowledge in HF patients with literacy deficits. Self-care maintenance and self-care symptom perception scores did not reveal statistical significance in the results but the increase between pre-post scores may have clinical relevance. Self-care management and self-care confidence showed that there was statistical significance between adequate and limited health literacy groups. This result indicates that each health literacy group benefitted from the intervention which resulted in increased HF self-management and confidence. The outcomes of the project suggest that the intervention is literacy-sensitive and may be appropriate for adult HF patients when knowledge and self-care behaviors need to be addressed. However, there were surprising findings amongst all the HF self-care scores between adequate and limited health literacy groups.

One of the most surprising findings of this project was the differences in pre-post self-care scores between the adequate and limited health literacy group. The limited health literacy group noticeably performed better than the adequate health literacy group in all self-care measures for pre-intervention and post-intervention scores. The principal investigator anticipated that the limited health literacy group would have had lower scores across all outcome measures for self-care. Several plausible explanations for these findings may exist.

One factor behind this is the small sample sizes within each group. If more time were allotted for the scope of the project, the assumption is that the project may have captured a larger HF population with limited health literacy and revealed anticipated results among all outcome measures. Another plausible reason that could have influenced the results is that there may have been more newly diagnosed HF patients in the adequate health literacy group. The three individuals with limited health literacy may have had longstanding HF, thus potentially possessing more awareness of HF self-care behaviors and skills. Some of the participants in the

adequate health literacy group had a diagnosis of HF that was six months or less prior to the beginning of the project. The results in the adequate health literacy group also suggest that the intervention may benefit HF patients with early diagnosis to adopt healthy lifestyle behaviors. Other co-existing illnesses such as depression may have contributed to the lower scores in self-care measures in the adequate health literacy group. Fifty-percent of the population completing this project had depression documented in their electronic medical record and forty-percent of them were from the adequate health literacy group. Depression can affect chronic disease care by altering brain function, amplifying somatic symptoms, and diminishing self-efficacy and the will to function (Kravitz and Ford, 2008). Since the intervention was given in a counseling format, it may provide additional support and the motivation needed to engage in self-care behaviors for HF patients with depression.

The principal investigator also noticed that participants in the limited health literacy group required more time during educational sessions or telephone consultations. For instance, the individuals within the limited health literacy group required up to twenty to thirty-minute discussions versus the fifteen to twenty-minute discussions for the adequate health literacy group. This finding suggests that HF patients with literacy deficits may require more time and education reinforcement to effectively make behavioral changes. Health literacy screening in outpatient settings may help practitioners to identify patient barriers to retaining pertinent health information and optimize patient education. Surprisingly, self-care confidence scores within this group had a ceiling effect which remained high at 95.83 for pre-intervention and post-intervention. Although self-care confidence is not a part of HF self-care, it measures how empowered a patient may feel to continue to manage their health or make new changes. This may reflect that these individuals already had the confidence to make changes to their health but,

were unaware of how they could continue to improve their HF knowledge and self-care behaviors. The participants were also informed of their literacy status; therefore, this information may have motivated them to diligently participate in the project instead of becoming discouraged about learning new information. However, inferences of this result are limited due to the small sample size within the groups.

Overall, the outcomes of this project offer further insight into a tailored intervention that may assist HF patients with literacy deficits. It has been proven in the literature that HF patients with literacy deficits are at risk for developing poor health outcomes and increased morbidity or mortality. Implementing education counseling programs may serve as a tertiary preventative measure to reduce HF complications, readmissions, and mortality. Furthermore, initiating the project intervention may lessen the impact of chronic disease on patient function, longevity, and quality of life. The results of this project indicate that it is important that healthcare professionals see their role in assessing health literacy to identify HF patients with barriers to adapting self-management skills and support this population by using a novel educational tool such as videos. Integrating health literacy-sensitive, educational self-management programs in outpatient settings may facilitate lifestyle and behavioral changes for HF patients with adequate or limited health literacy.

Strengths and Limitations

The selected pretest-posttest design presents with project limitations. The pretest-posttest research design limits the ability to gain statistical significance from the findings of the project due to the lack of a control group. This research design also limits external validity, meaning that it may be difficult to generalize the results or make predictions about the entire population. Convenience sampling of willing participants increased the risk of selection bias. There is

selection bias present within the project due to the nature of how participants were approached and recommended to participate in the project. The six-week time frame to implement is another project limitation. Comparable studies assessed changes in HF self-management, HF knowledge, or self-efficacy within 6 months to 2 years (Albert et al., 2007; Veroff et al., 2012; Tsuyuki et al., 2019). Although the scope of the project did not allow for a longer time period, it serves as a framework for replication and future implementation of research or quality improvement projects regarding health literacy assessment and VBE counseling in HF patients. Additionally, the sample size is a limitation of the project which limits generalizability to the entire population. The small sample size of the project also reduces the power of the study and affects reliability.

Although not a project limitation, there were a few barriers to project implementation. It was anticipated that participants would have the option to watch the videos during patient appointments. The principal investigator had to adapt to the clinic workflow and realized that this option was no longer feasible due to conflicts in provider or nurse time and hours of operation of the HF clinic. Consequently, the option for patients to watch videos during patient appointments was no longer permitted and VBE sessions were implemented after patient appointments only.

Several strengths increase the reliability and validity of the project. The project utilizes evidence-based practice according to HF guidelines and recommendations. The project also promotes interprofessional collaboration amongst providers and nurses while the aim is to improve patient education delivery and health outcomes. The principal investigator collaborated with each participant's HF provider and sat in during patient appointments to gain more knowledge of what self-care or knowledge topics should be targeted for the patient. Another strength of the project is that it was implemented within an outpatient setting since, the majority

of studies found in the literature utilized VBE in inpatient hospital settings. Utilizing VBE within the HF population has been understudied; therefore, the project greatly contributes to research and clinical practice. Furthermore, the project also aims to tailor education based on health literacy level and patient learning needs; which is also understudied within the literature. Therefore, the implementation of this project consistently emphasizes the use of evidence-based research and applies it to nursing practice. High participation rates were achieved through regular contact via telephone, text, or email with project participants. Regular contact with the project participants increased their will to stay engaged, which prevented participant attrition. Lastly, the project uses three validated measurement tools and a theoretical framework that encapsulates the outcomes of the project.

Nursing Implications

Tailoring patient education according to health literacy level can be a pivotal step to bridging the gap between evidence and practice. HF practice guidelines emphasize the role of health literacy as an important factor to address in improving patient self-management. Nurses are in a position to improve communication and educational delivery within HF patients. Health literacy screening may offer an essential point of intervention within rural and underserved populations with limited health literacy. Informing health professionals about the significance of health literacy can increase recognition of factors that may compromise HF self-care management. Healthcare organizations and institutions should consider integrating health literacy as a quality assessment in electronic medical records during initial patient visits. By addressing health literacy in HF, nurses and other collaborative professionals such as; HF nurses, and HF navigators can empower their patients with low or marginal health literacy and increase their decision-making and self-management abilities.

The provision of VBE counseling in outpatient settings is an effective strategy to improve health outcomes in HF patients. Using video-based education in clinical settings can expand efforts to provide valuable patient education according to evidence-based practice (Dahodwala et al., 2018). Nurses who specialize in HF or HF navigators are essential healthcare professionals who can implement and guide HF patients to adapt self-care behaviors within educational or counseling programs. In addition, implementing VBE counseling in HF patients can serve as a useful educational service that is convenient, easy to understand, and improve self-care and HF knowledge. Current evidence reveals that HF patients with limited health literacy require visual educational modalities to fully address learning needs rather than written or oral education only. VBE serves as a cost-effective approach that can decrease patient morbidity and mortality.

Future research is warranted to examine the effects of education counseling programs on decreasing HF-related hospitalizations and improving quality of life in HF patients. A research design with a control and experimental group would best determine the differences in improving HF self-management and knowledge between a VBE counseling program and usual HF education in an outpatient setting. A larger and more diverse HF population would best determine the effects of VBE counseling on improving outcomes in HF patients. A longer study period may also best determine how this population improves self-management behaviors over time. The project would benefit from replication to capture more HF patients with limited health literacy to determine if education counseling programs are a promising solution to address HF patients with literacy deficits. Understanding their experiences is essential if we are to provide optimal care and services that address the full spectrum of the adult HF population.

The Role of the DNP Nurse

The role of the Doctor of Nursing Practice provider takes several important standpoints in implementing evidence-based practice projects, quality improvement, and research. DNP-prepared nurses are at the forefront of healthcare to improve the quality and delivery of patient education by directing counseling programs that facilitate disease self-management. The DNP-prepared nurse is in an excellent position to influence nursing practice, technology implementation, and the integration of practice and technology (Hickey & Brosnan, 2017). Furthermore, the DNP-prepared nurse integrates scholarship and the eight essential components in their practice that are needed to make healthcare practice changes on a local, organizational, or policy level.

DNP-prepared nurses are in the position to foster a multidisciplinary approach to patient education that focuses on health literacy in clinical settings. DNP-prepared nurses are capable of empowering patients to become more knowledgeable and involved in health maintenance, disease prevention, and chronic disease management (Hickey & Brosnan, 2017). VBE in educational practices serves as an essential method to improve HF knowledge and self-care in HF patients with literacy deficits. These interventions for patient care can increase interprofessional collaboration and enhance the provision of evidence-based practice. The DNP-prepared nurse is a powerful advocate for improving clinical practice and patient resources within a community setting.

Conclusion

Heart Failure is a growing health problem that requires a multifaceted and coordinated interprofessional approach to disease management. HF patients may face complications due to limited health literacy or lack of educational resources. The solution must go beyond patient education that is delivered only during health visits. The results of this project indicate that implementing a VBE counseling intervention that tailors patient education according to an individual's health literacy level and learning needs may improve outcomes for HF patients. The project contributes to the gaps in the literature on the use of a novel educational tool for HF self-management and knowledge. If established in outpatient and primary care settings, the intervention can become an option for patients to receive additional support and education to improve disease self-management. A VBE counseling program may serve as an education referral for providers when those with limited health literacy are identified. It introduces an innovative and evidence-based approach to patient education delivery in clinical settings. A healthcare organization that acknowledges health literacy and patient-centered care ensures that every patient receives the greatest benefit of healthcare services and information. Healthcare providers are in a position to improve the quality of life and overall health of HF patients. Using a highly effective educational method that is proven to improve health outcomes is a pivotal step towards practice change.

Products of the DNP Capstone Project

A comprehensive report of the DNP scholarly project will be submitted to the University of Virginia, School of Nursing upon completion of the Doctor of Nursing Practice program. The project findings will be disseminated to the two HF clinics, involving members of the project, and leadership members at each facility. Following the completion of this project, the product is that the project will increase provider awareness of the impact of health literacy on HF patients. Also, it may be implemented as a standard of care within HF clinics and other affiliated healthcare facilities. The VBE brochure created by the principal investigator remained at the two clinics for continuing patient access to the educational HF videos and future replication. Abstracts will be submitted to the Doctor of Nursing Practice conference and The Heart Failure Society of America conference for poster presentation upon completion of the DNP project. A manuscript suitable for publication will be submitted to *The Journal of Cardiac Failure*, *The Journal of Health Literacy*, *The Journal of Cardiovascular Nursing*, and *The Journal of Nurse Practitioners*. Author guidelines for publication to *The Journal of Cardiac Failure* are included in Appendix Q.

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Table 1

Description of Studies

Reference	Study Design/Study Purpose	Study Sample, Subjects & Setting	Duration of Study	Intervention & Control	Study Outcomes	Limitations/Risk of Bias	Level of Evidence/ Quality Grade
Albert et al., 2007	Quasi-experimental study. To determine if video education (VE), in addition to standard education reduces urgent healthcare resource consumption; specifically, emergency care and hospitalization and improves post-discharge self-care and lifestyle behaviors, including patient-initiated actions for signs and symptoms of volume overload or fatigue within 3 months of the index hospitalization.	<p>112 hospitalized subjects with acute decompensation of congestive heart failure sampled by convenience.</p> <p>Large, urban medical center with 1,000 + beds in Midwestern United States.</p> <p>Subjects were aged 18-85 years, diagnosed with heart failure with an ejection fraction of 40% or less, owned a working video player and television, cared for themselves, spoke English, and owned a telephone to participate.</p>	May 2000-July 2002	<p>Intervention group received standard education which included verbal and written information plus home video guide to self-care for heart failure patients.</p> <p>Control group received standard education of written and verbal discharge instructions.</p>	<p>Self-care scores was significantly higher for the intervention group at 90 day follow up ($p < .01$). The VE group also had a greater reduction in mean number of symptoms for fatigue with exertion and edema ($p < .04$).</p> <p>Video education can prompt patients to take actions</p>	<p>Researchers obtained subjects through convenience sample limiting external validity of the study. There is also increases the risk for selection bias.</p> <p>Researchers were only able to follow-up on 76 subjects out of 112, only 22% of the intervention group did not watch the video.</p> <p>Most of the patients were also treated by HF cardiologists instead of internal medicine providers which also poses as a selection bias.</p>	Level II Grade B

				A 36-item Likert tool scale was used to measure self-care and lifestyle behaviors.	for worsening symptoms, especially with usage of realistic demonstration of lifestyle behaviors.		
Cajita et al., 2016	Systematic review. To explore the role of health literacy among HF patients with specific aims to describe the prevalence of low health literacy among HF patients, to explore the predictors of low health literacy among HF patients and discuss the relationship between health literacy and HF self-care and common HF outcomes.	23 articles were included for the systematic review, 22 published journal articles and 1 unpublished doctoral dissertation. 4 studies used subsets of data from a larger randomized controlled trial testing a literacy-sensitive HF self-care training intervention.	Published articles from 1999-2014.	N/A	An average of 39% of HF patients have low health literacy. 2 studies found an association between higher health literacy and better self-care maintenance (P = .006) (P = .002). Low health	Most of the studies included within the review were observational. Small sample of studies were included for the review. Limits generalizability of the findings to healthcare systems in other countries given that all articles except for 1 were conducted in the United States.	Level II Grade B

					<p>literacy was found to be associated with increased incidence of HF-related admissions.</p> <p>The S-TOFHLA was the most used measurement tool for health literacy.</p>		
Chen et al., 2011	<p>Pilot study. To examine the relationship between patient health literacy level and self-care maintenance, management, and confidence in patients with heart failure.</p>	<p>49 participants recruited from a variety of community settings in Indiana including 2 heart failure clinics (1 urban, 1 rural), 2 continuing-care retirement communities, a community hospital, and a cardiology practice. Participants were 18 years or older, had a diagnosis of</p>	<p>August 2008-March 2010</p>	<p>The S-TOFHLA was used to measure health literacy of each participant.</p> <p>The SCHFI v.4 was used to measure self-care. Each measure utilized in study was</p>	<p>Health literacy was positively related to self-care maintenance (0.357, P =.006). Higher educational status was related to higher health literacy (P = .007).</p>	<p>Convenience sampling and non-randomization of the study limits generalizability and increases risk for selection bias.</p> <p>Small sample size and unequal numbers of participants with adequate, marginal, and inadequate health literacy.</p>	<p>Level III Grade B</p>

		HF, could read and speak English, and were not cognitively impaired.		documented for its reliability and validity using Cronbach alpha (0.98 for S-TOFHLA, and 0.82 for SCHFI).	HF patients with inadequate health literacy, they are more likely to have difficulty in understanding health information and acting upon it to perform self-care.		
Fabbri et al., 2018	Non experimental; descriptive. To examine the impact of health literacy on hospitalizations and death in HF patients.	2487 heart failure patients identified by their medical records by a linkage system of the Rochester Epidemiology Project (REP). Conducted in 11 counties in southeast Minnesota Patients were 18 years or older, male sex, not married, education level ranging from non-high school	Jan. 2013-Dec. 2015	The selected heart failure patients were mailed a survey packet to assess health literacy using a 3-question brief screener and to identify socio-behavioral components. Patients were followed for death and hospitalization	Poor health literacy was associated with increased risk of hospitalizations and half more than a 2-fold increased risk of death compared with those with adequate literacy (p <.001).	The study presents a risk for researcher bias due to the influence on the results. Data was collected through convenience by use of mail or telephone. There is a risk for confounding bias due to an independent determinant of the outcome in the study by the researchers.	Level III Grade C

		graduate to graduate school.		ns.			
Moser et al., 2015	A randomized controlled trial (Rural Education to Improve Outcomes in Heart Failure) to examine the association of health literacy measured with the use of the S-TOFHLA with heart failure readmission rates an all-cause mortality, controlling for demographic, clinical, and psychologic covariates potentially related to the outcomes or to health literacy.	575 hospitalized rural adults with heart failure in rural areas of California, Nevada, and Kentucky. Patients were recruited from outpatient clinics and hospitals after referral to the study by their health care providers.	2 years	Participants were randomly assigned to the usual care group, fluid watchers' LITE group, which included the education program with minimal follow-up; and Fluid watchers PLUS group, which included the education program with attention to individualization and biweekly follow-up.	The study reveals that patients with inadequate and marginal health literacy were 1.94 (P <.001) times, and 1.91 (P<.001) times more likely to experience HF readmissions or all-cause mortality death amongst rural adults with heart failure. 249 heart failure admissions and there were significantl	The study is not generalizable to non-rural populations. The uneven n	Level I Grade B

					y more in the inadequate and marginal health literacy groups than in the adequate health literacy group.		
Tsuyuki, R., et al., 2019	Randomized controlled trial. The Congestive Heart Failure Outreach Program of Education (COPE) study was created to determine the effect of a video-based educational intervention for patients with HF on clinical outcomes.	<p>539 HF patients</p> <p>Conducted in 22 academic and community hospital centers in Canada and the United States.</p> <p>Subjects were patients with symptomatic HF greater than 18 years of age, on current HF medication therapy, medical history of heart disease or diabetes, and duration of HF as new-onset, less than 12 months, 13-48 months, and</p>	6 months	<p>270 patients were allocated to the intervention group which consisted of a 20-minute educational video on a portable DVD player during their hospital or clinic stay.</p> <p>Patients were provided with an educational booklet and a diary to study end points.</p>	<p>The implementation of video-based education in HF patients did not have an effect on decreasing hospitalizations (P = 0.66).</p> <p>However, the use of video-based education had a significant increase in HF knowledge</p>	Study limitations includes risk of bias due to patient selection issues and contamination of the control group given that the same written educational materials were provided. There is also a possible chance for volunteer bias whereby patients who are most interested in their disease will likely give consent to participate.	Level I Grade B

		greater than 48 months.		269 patients were allocated to the control group for usual care which consisted of usual HF education, an educational booklet.	scores by the end of study. There was also a statistically significant reduction in mortality between the intervention (P= 0.03).		
Veroff et al., 2012	A randomized controlled trial to determine the relative benefits of using an evidence-based medical decision aid, DVD booklet that highlights the steps for daily management of HF versus using standard education materials, which includes basic program information and a simple fact sheet about heart failure.	2349 HF patients were enrolled for the study. Members who purchased Medicare Advantage coverage offered by a large not-for-profit health plan were considered eligible for the study.	March 2007-January 2008	Subjects in the intervention group received a medical decision aid, which consists of a 29-minute DVD format decision aid and a 38-page booklet about HF management in addition to standard education. Subjects in the control group	The difference in daily weight monitoring was statistically significant in the intervention group (p = .05). The study intervention yielded improvement in self-care behaviors.	The study impacts generalizability to other age groups because a majority of the subjects were 75 years or older. There was only 20% of survey respondents in the intervention group which decreases the power of the study. The study originally intended for 50% of the survey responses.	Level I Grade B

				received standard HF education.			
--	--	--	--	---------------------------------------	--	--	--

Table 2

Description of Articles

<p style="text-align: center;">Reference</p> <p style="text-align: center;">Element Type</p>	<p style="text-align: center;">Summary of Relevant Material</p>
<p>Bos-Touwen et al., 2015</p> <p>Heart Failure Report</p>	<ul style="list-style-type: none"> • To optimize effectiveness of educational interventions for self-management in heart failure patients, it is prompted to use targeted or tailored interventions to improve health outcomes. • Patients with low health literacy, low education, and low income at baseline are suitable candidates for self-management support. • Future studies are needed to evaluate and study the added value of tailoring interventions in terms of behavioral change techniques, mode of delivery, and intensity.
<p>Evangelista et al., 2010</p> <p>Consensus Statement of the Heart Failure Society of America</p>	<ul style="list-style-type: none"> • Low health literacy is associated with decreased knowledge of one's medical condition, poor medication recall, nonadherence to treatment plans, poor self-care behaviors, compromised physical and mental health, greater risk of hospitalization, and increased mortality. • Health care providers are often unaware of literacy problems in their HF patients. Many health care providers overestimate patients' understanding of health information and few recommend appropriate educational strategies. • General health literacy principles should be applied to patients with heart failure. Clinicians treating patients with heart failure should address health literacy using five steps: recognize the consequences of low health literacy, screen patients at risk, document literacy levels and learning preferences,

	<p>and integrate effective strategies to enhance patients' understanding into practice.</p>
<p>Westlake et al., 2013 Heart Failure Report</p>	<ul style="list-style-type: none">• Health literacy is a key determinant of health and critical dimension for assessing individual needs and capacity for self-care.• Providers could improve self-care abilities in HF patients by assessing their own knowledge of health literacy, and their teaching skills.• Understanding the relationships between and among health literacy determines outcomes is needed to help identify intervention points.• Patient assessment of health literacy could be integrated as a routine assessment to address their disease management goals.

Table 3

Participant Characteristics

Variables	Enrolled Subjects (<i>N</i> = 10)
Age, mean (SD), years	55.90 (14.64)
Gender, n (%)	
Female	4 (40.0)
Male	6 (60.0)
Race, n (%)	
African American	1 (10.0)
White	9 (90.0)
Education level, n (%)	
High school graduate	2 (20.0)
Completed some college	4 (40.0)
College Graduate	4 (40.0)
Employment status, n (%)	
Unemployed	3 (30.0)
Employed	2 (20.0)
Retired	4 (40.0)
Disabled	1 (10.0)
Relationship status, n (%)	
Not Married	2 (20.0)
Married	8 (80.0)
Annual Income, n (%)	
\$50,000 or less	3 (30.0)
\$51,000 - \$74,000	2 (20.0)
\$75,000 or more	5 (50.0)

Table 4

Clinical Characteristics

Variable	Enrolled Subjects (<i>N</i> = 10)
Health Literacy Level, <i>M</i> (<i>SD</i>)	30.40 (7.26)
NYHA HF Class, n (%)	
Class II	3 (30.0)
Class III	7 (70.0)
Type of Heart Failure, n (%)	
Systolic	8 (80.0)
Diastolic	2 (20.0)
Ejection Fraction, n (%)	
HF _r EF (EF ≤ 40%)	7 (70.0)
HF _p EF, borderline (EF 41-49%)	2 (20.0)
HF _p EF (EF ≥ 50%)	1 (10.0)
Comorbidities, n (%)	
Hypertension	10 (100.0)
Diabetes	2 (20.0)
Obesity	5 (50.0)
Depression	5 (50.0)
Hyperlipidemia	4 (40.0)
Chronic kidney disease	4 (40.0)
Coronary artery disease	4 (40.0)
Chronic lung disease	1 (10.0)
Cancer	2 (20.0)
Arthritis	4 (40.0)
Migraines	1 (10.0)

Table 5

Results of Primary Outcome Measures (N = 10)

Variables	Pre-test Mean (SD)	Post-test Mean (SD)	Differences Mean (SD)	<i>p</i> -value
Heart Failure Knowledge	26.0 (1.9)	28.0 (0.7)	2.0 (2.1)	.011*
Self-care maintenance	75.0 (17.2)	86.3 (17.9)	11.3 (9.0)	.003*
Self-care symptom perception	77.8 (22.4)	90.2 (9.3)	12.4 (14.7)	.021*
Self-care management	59.7 (21.7)	78.2 (10.3)	18.5 (14.2)	.005*
Self-care confidence	82.3 (17.9)	91.3 (9.8)	9.0 (10.2)	.015*

*¹**p < .05** Wilcoxon Signed Rank Test² Paired-Samples T-Test

Table 6

Results of Primary Outcome Measures between the Health Literacy Groups

Variables	Adequate Health Literacy (<i>N</i> = 7)		Limited Health Literacy (<i>N</i> = 3)		<i>p</i> -value
	<i>M</i> (<i>SD</i>)	<i>Mdn</i> (<i>IQR</i>)	<i>M</i> (<i>SD</i>)	<i>Mdn</i> (<i>RNG</i>)	
Heart Failure Knowledge	1.3 (1.4)	1.0 (0.0 - 2.0)	3.7 (2.9)	2.0 (2.0 - 7.0)	.117
Self-care maintenance	11.4 (10.4)	10.0 (2.5 - 15.0)	10.8 (6.3)	10.0 (5.0 - 17.5)	1.000
Self-care symptom perception	14.3 (17.2)	13.0 (0.0 - 17.4)	8.0 (6.3)	4.3 (4.3 - 15.2)	.667
Self-care management	22.9 (14.9)	21.2 (12.1 - 24.2)	8.1 (3.5)	6.1 (6.1 - 12.1)	.033*
Self-care confidence	12.9 (9.7)	10.0 (7.5 - 15.0)	0.0 (2.5)	0.0 (-2.5 - 2.5)	.017*

Note. IQR = Interquartile Range, where the *N* = 7, the Interquartile range is given as the 25th percentile – 75th percentile. RANGE = Range, where the *N* = 3, the Range is given as the minimum and maximum values.

**p* < .05 Mann-Whitney U Exact test

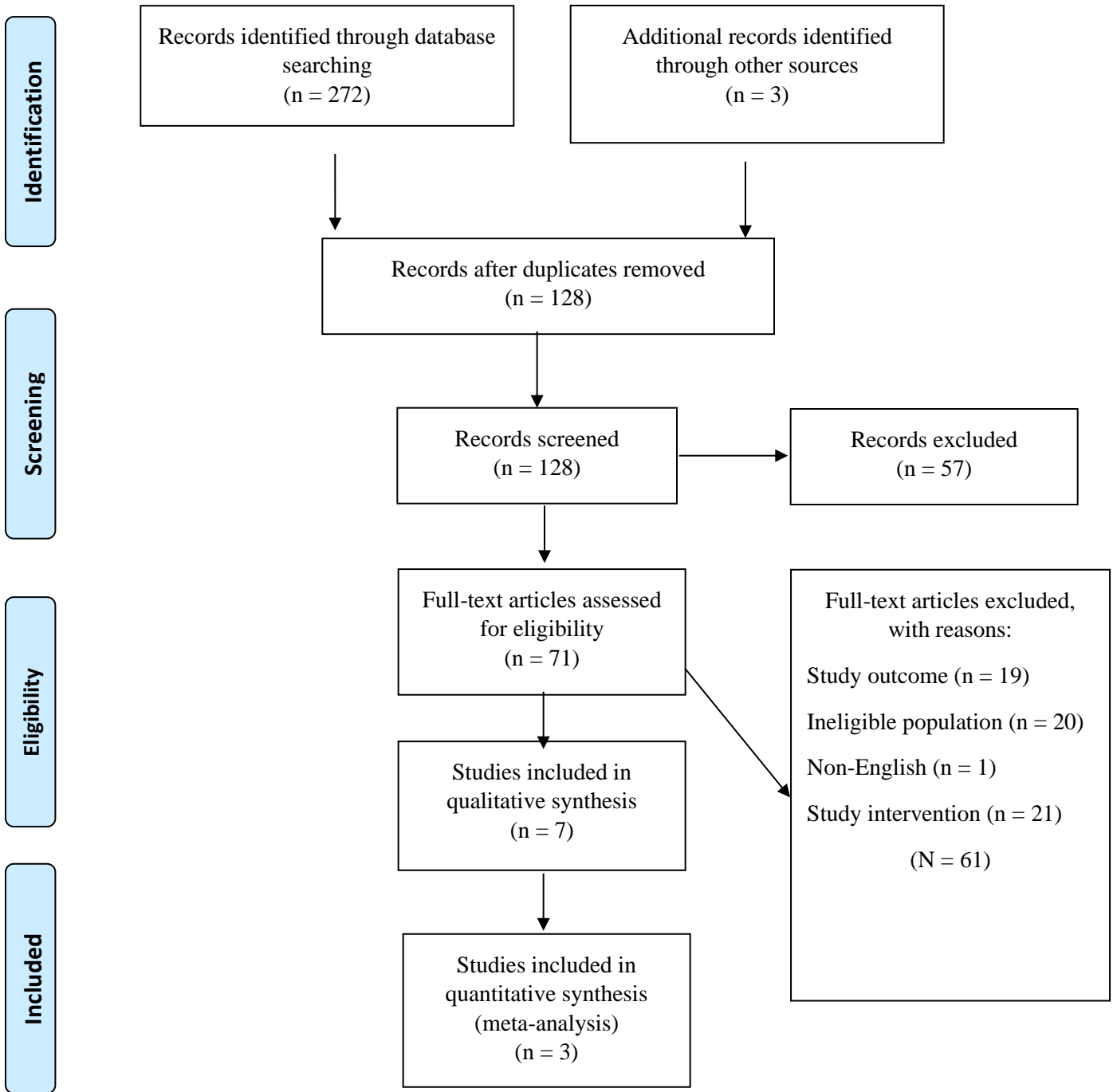


Figure 1. PRISMA flow diagram of review of literature.

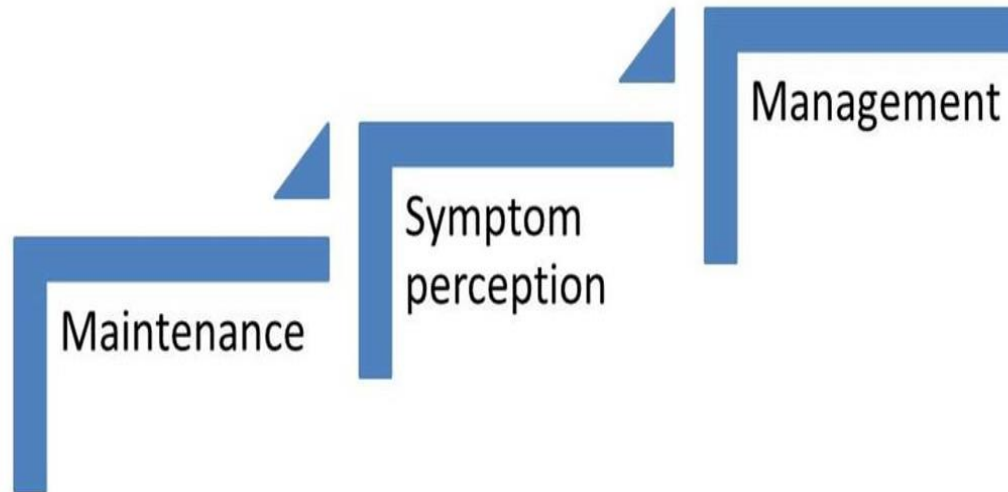


Figure 2. The situation-specific theory of heart failure self-care. Adapted from Riegel, B., Vaughan Dickson, V., & Faulkner, K. M. (2016). The situation-specific theory of heart failure self-care. *Journal of Cardiovascular Nursing*, 31(3), 226-235.

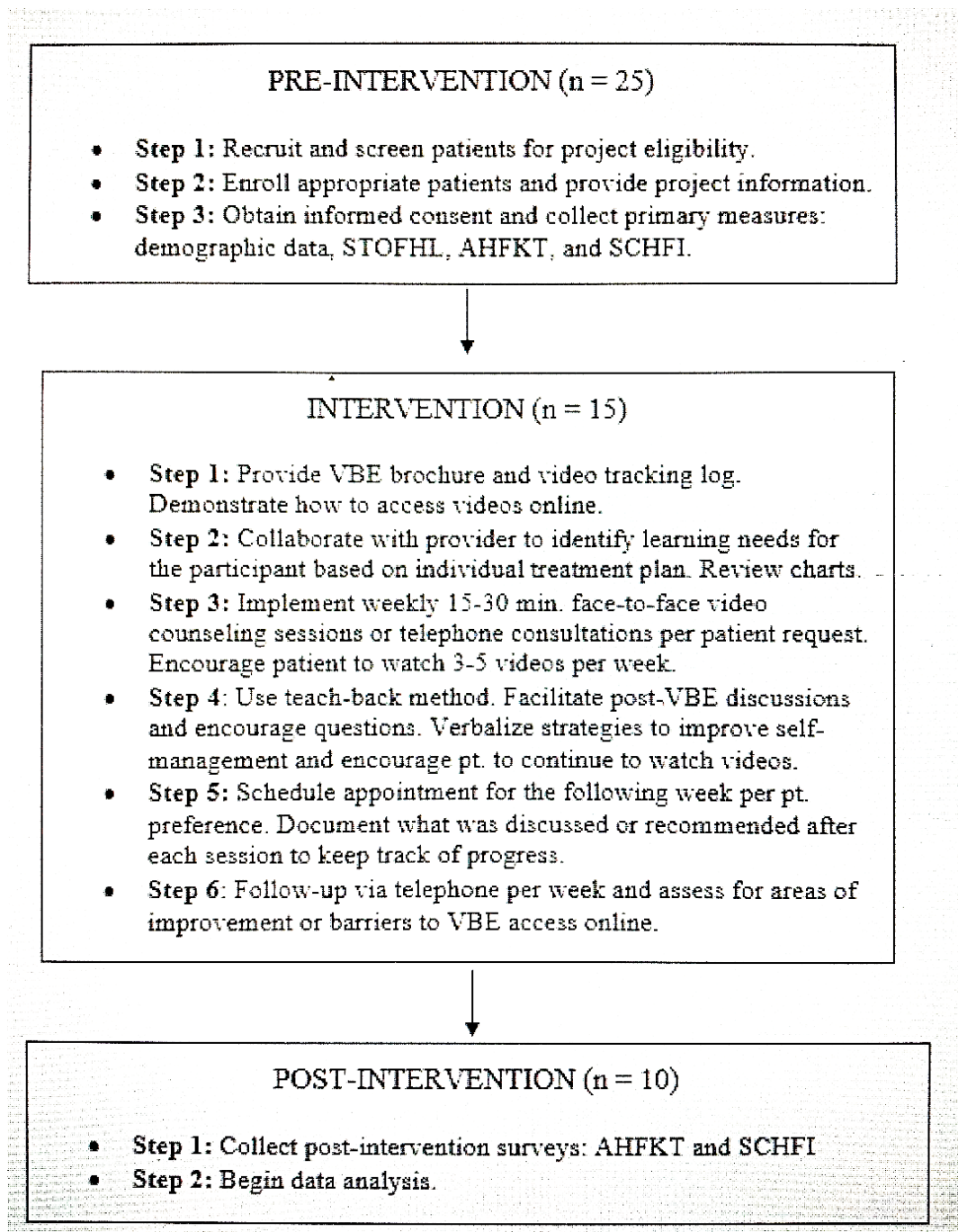


Figure 3. Project Protocol: Step-by-Step Intervention Process.

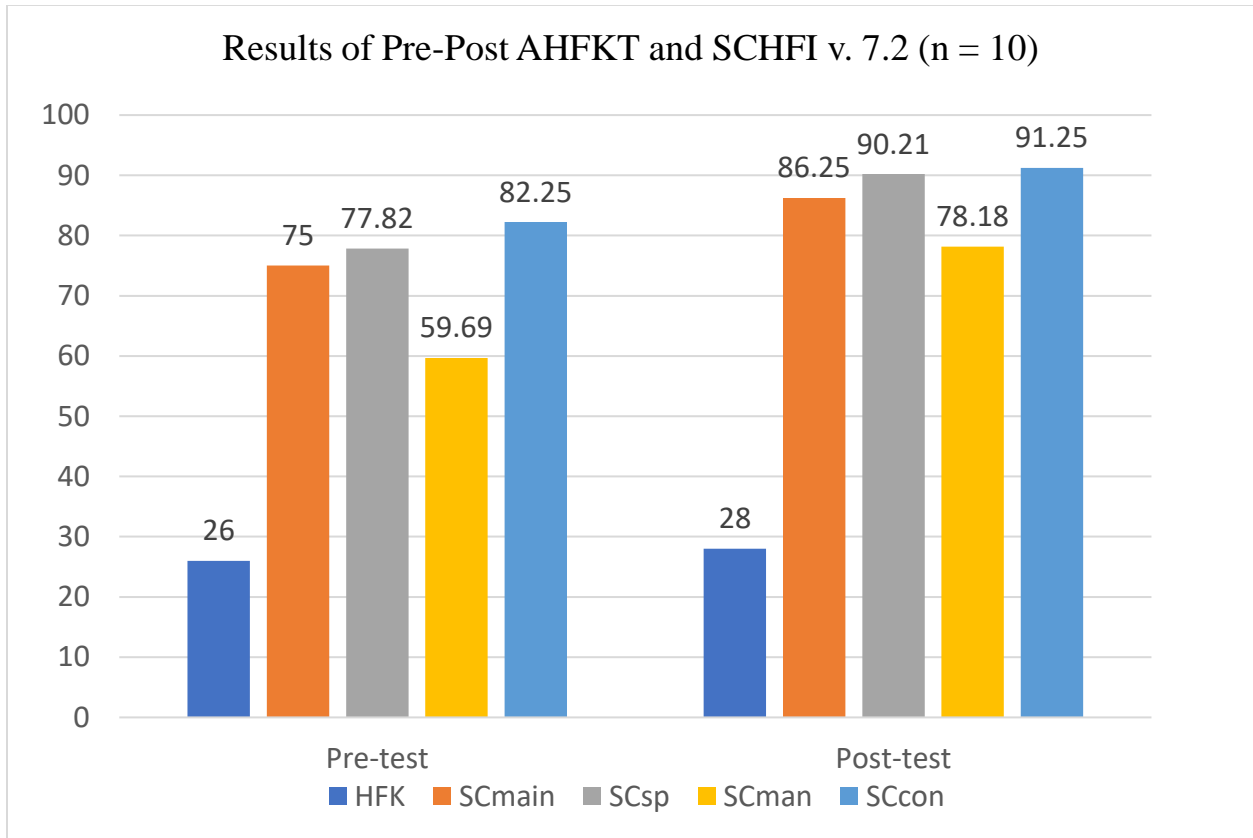


Figure 4. Results of Primary Outcome Measures

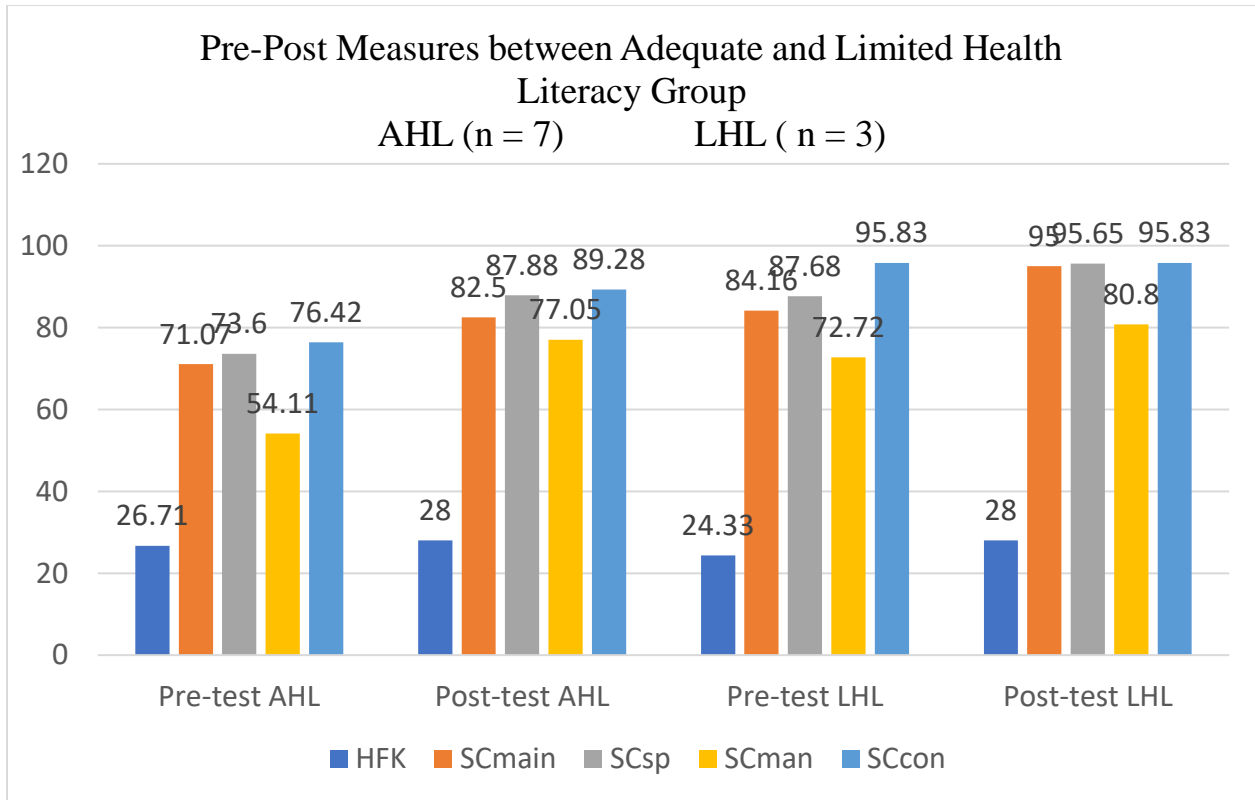



Figure 5. Results of Outcome Measures between Adequate and Limited Health Literacy Group

Appendix A. IRB Exemption Form: Augusta Health Heart and Vascular Center



Augusta Health
PO Box 1000
Fishersville, VA 22939

Phone (540) 333-1000 **Sturgeson**
Phone (540) 932-1000 **Haynesboro**
Toll Free 1-800-952-1267
www.augustahhealth.com

Notice of IRB EXEMPTION

Principal Investigator: Paula Atueyi
Tami Collins, NP

Protocol Title: Utilizing Video-Based Education to Address Health Literacy in Heart Failure Patients

IRB #: 00002496

IRB Study #: 19-03

Type of Review: Initial - EXEMPT


Date of Approval: NA

The Institutional Review Board Chairman of Augusta Health has reviewed your study submission and has determined that it is **EXEMPT** from IRB submission, review and approval.

Exemption from IRB Committee review is based on the fact that there are no patient identifiers and no risk to patients. This is strictly a Quality Improvement study which uses existing knowledge to improve health care outcomes within a local health care institution or setting.

When an activity involving data is intended to evaluate an existing practice and attempt to improve it based upon existing knowledge, the Augusta Health IRB would not classify this activity as research and the activity would not be subject to the Department of Health and Human Services (DHHS) human research regulations.

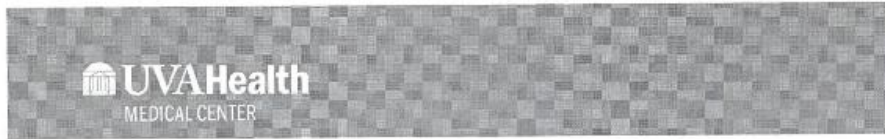
The Augusta Health Institutional Review Board, #WA 00003292, is duly constituted, fulfilling all requirements for diversity, and has written procedures for initial and continuing review of human subjects research protocols. The AH IRB complies with all US regulatory requirements related to the protection of human research participants, specifically 45CFR46, 21CFR50, 21CFR56, 21CFR312, 21CFR812, 45CFR164.508-14. In addition, the AH IRB complies with the guidelines of the Office of Human Subjects Protection of the OHHS.


 William Cohee, Pharm.D.
 Authorized Signature

3 Oct 2019
 IRB Signature Date

February 2014

Appendix B. Permission Letter: University of Virginia Heart and Vascular Center



Marian Lawson, RN
Manager of Heart Failure Program
UVA Health
Charlottesville, VA 22908

October 17, 2019

Paula Atueyi
c/o The University of Virginia School of Nursing
225 Jeanette Lancaster Way
Charlottesville, VA 22903

Dear Ms. Atueyi,
After discussion in the Heart Failure Quality Support Team and with Heart & Vascular Center leadership, we are pleased to notify you that you have been granted permission to conduct your Doctor of Nursing Practice project focusing on use of video education in the outpatient setting in our Heart Failure NP clinics. Our teams look forward to working with you and are excited to see how this intervention may benefit our patients.

Respectfully,

A handwritten signature in black ink, appearing to read "Marian Lawson".

Marian Lawson, RN
Manager of Heart Failure Program
UVA Health



Appendix C. CITI Training Certification



Completion Date 06-Feb-2019
Expiration Date 05-Feb-2022
Record ID 25874668

This is to certify that:

Paula Atueyi

Has completed the following CITI Program course:

Human Research (Curriculum Group)
IRB for Health Sciences Research (IRB-HSR): ALL RESEARCH (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

University of Virginia



Verify at www.citiprogram.org/verify/?wcb092c98-fd77-4ada-86aa-a3b9b4f0d622-25874668

Appendix D. Short Test of Functional Health Literacy in Adults

Short Test of Functional Literacy in Adults
STOFHLA
READING COMPREHENSION

HAND PATIENT THE READING COMPREHENSION PASSAGES TO BE COMPLETED. FOLD BACK THE PAGE OPPOSITE THE TEXT SO THAT THE PATIENT SEES ONLY THE TEXT.

PREFACE THE READING COMPREHENSION EXERCISE WITH:

“Here are some other medical instructions that you or anybody might see around the hospital. These instructions are in sentences that have some of the words missing. Where a word is missing, a blank line is drawn, and 4 possible words that could go in the blank appear just below it. I want you to figure out which of those 4 words should go in the blank, which word makes the sentence make sense. When you think you know which one it is, circle the letter in front of that word, and go on to the next one. When you finish the page, turn the page and keep going until you finish all the pages.”

STOP AT THE END OF 7 MINUTES

PASSAGE A: X-RAY PREPARATION

PASSAGE B: MEDICAID RIGHTS AND RESPONSIBILITIES

PASSAGE A

A1	(1)	(0)
a.		
b.		
c.		
d.		

A2	(1)	(0)	A3	(1)	(0)
a.			a.		
b.			b.		
c.			c.		
d.			d.		

A4	(1)	(0)	A5	(1)	(0)
a.			a.		
b.			b.		
c.			c.		
d.			d.		

Sub-Total

PASSAGE A

Your doctor has sent you to have a _____ X-ray.

- a. stomach
- b. diabetes
- c. stitches
- d. germs

You must have an _____ stomach when you come for _____.

- | | |
|-----------|--------|
| a. asthma | a. is. |
| b. empty | b. am. |
| c. incest | c. if. |
| d. anemia | d. it. |

The X-ray will _____ from 1 to 3 _____ to do.

- | | |
|---------|-----------|
| a. take | a. beds |
| b. view | b. brains |
| c. talk | c. hours |
| d. look | d. diets |

A6 (1) (0)	A7 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

A8 (1) (0)	A9 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

A10 (1) (0)	A11 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

Sub-Total

THE DAY BEFORE THE X-RAY.

For supper have only a _____ snack of fruit, _____ and jelly,

- | | |
|-----------|-----------|
| a. little | a. toes |
| b. broth | b. throat |
| c. attack | c. toast |
| d. nausea | d. thigh |

with coffee or tea.

After _____, you must not _____ or drink

- | | |
|--------------|----------|
| a. minute, | a. easy |
| b. midnight, | b. ate |
| c. during, | c. drank |
| d. before, | d. eat |

anything at _____ until after you have _____ the X-ray.

- | | |
|---------|--------|
| a. ill | a. are |
| b. all | b. has |
| c. each | c. had |
| d. any | d. was |

A12	(1)	(0)
a.		
b.		
c.		
d.		

A13	(1)	(0)	A14	(1)	(0)
a.			a.		
b.			b.		
c.			c.		
d.			d.		

A15	(1)	(0)	A16	(1)	(0)
a.			a.		
b.			b.		
c.			c.		
d.			d.		

Sub-Total

THE DAY OF THE X-RAY.

Do not eat _____.

- a. appointment.
- b. walk-in.
- c. breakfast.
- d. clinic.

Do not _____, even _____.

- | | |
|-----------|------------|
| a. drive, | a. heart. |
| b. drink, | b. breath. |
| c. dress, | c. water. |
| d. dose, | d. cancer. |

If you have any _____, call the X-ray _____ at 616-4500.

- | | |
|---------------|---------------|
| a. answers, | a. Department |
| b. exercises, | b. Sprain |
| c. tracts, | c. Pharmacy |
| d. questions, | d. Toothache |

B17	(1)	(0)
a.		
b.		
c.		
d.		

B18	(1)	(0)	B19	(1)	(0)
a.			a.		
b.			b.		
c.			c.		
d.			d.		

B20	(1)	(0)
a.		
b.		
c.		
d.		

B21	(1)	(0)	B22	(1)	(0)
a.			a.		
b.			b.		
c.			c.		
d.			d.		

B23	(1)	(0)
a.		
b.		
c.		
d.		

Sub-Total

PASSAGE B

I agree to give correct information to _____ if I can receive Medicaid.

- a. hair
- b. salt
- c. see
- d. ache

I _____ to provide the county information to _____ any

- | | |
|----------|--------------|
| a. agree | a. hide |
| b. probe | b. risk |
| c. send | c. discharge |
| d. gain | d. prove |

statements given in this _____ and hereby give permission to

- a. emphysema
- b. application
- c. gallbladder
- d. relationship

the _____ to get such proof. I _____ that for

- | | |
|-----------------|----------------|
| a. inflammation | a. investigate |
| b. religion | b. entertain |
| c. iron | c. understand |
| d. county | d. establish |

Medicaid I must report any _____ in my circumstances

- a. changes
- b. hormones
- c. antacids
- d. charges

B24 (1) (0)	B25 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

B26 (1) (0)	B27 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

B28 (1) (0)	B29 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

B30 (1) (0)
a.
b.
c.
d.

B31 (1) (0)	B32 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

Sub-Total

within _____ (10) days of becoming _____ of the change.

- | | |
|----------|----------|
| a. three | a. award |
| b. one | b. aware |
| c. five | c. away |
| d. ten | d. await |

I understand _____ if I DO NOT like the _____ made on my

- | | |
|---------|---------------|
| a. thus | a. marital |
| b. this | b. occupation |
| c. that | c. adult |
| d. than | d. decision |

case, I have the _____ to a fair hearing. I can _____ a

- | | |
|-----------|------------|
| a. bright | a. request |
| b. left | b. refuse |
| c. wrong | c. fail |
| d. right | d. mend |

hearing by writing or _____ the county where I applied.

- a. counting
- b. reading
- c. calling
- d. smelling

If you _____ TANF for any family _____, you will have to

- | | |
|----------|--------------|
| a. wash | a. member, |
| b. want | b. history, |
| c. cover | c. weight, |
| d. tape | d. seatbelt, |

B33 (1) (0)	B34 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

B35 (1) (0)	B36 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

READING COMPREHENSION
RAW SCORE

Sub-Total

- _____ a different application form. _____, we will use
- | | |
|-----------|-------------|
| a. relax | a. Since, |
| b. break | b. Whether, |
| c. inhale | c. However, |
| d. sign | d. Because, |

- the _____ on this form to determine your _____.
- | | |
|-----------|-------------------|
| a. lung | a. hypoglycemia. |
| b. date | b. eligibility. |
| c. meal | c. osteoporosis. |
| d. pelvic | d. schizophrenia. |

Short Test of Functional Health Literacy in Adults (STOFHLA)

Joanne R. Nurss, Ph.D., Ruth M. Parker, M.D., Mark V. Williams, M.D., & David W. Baker, M.D., M.P.H.

TOFHLA is a measure of the patient's ability to read and understand health care information, their functional health literacy. TOFHLA Numeracy assesses their understanding of prescription labels, appointment slips, and glucose monitoring. TOFHLA Reading Comprehension assesses their understanding of health care texts such as preparation for a diagnostic procedure and Medicare Rights & Responsibilities.

Date ____/____/____

Name _____ M ____ F

Birthdate ____/____/____ Age ____ SSN or ID# _____

Hospital or Health-care-Setting _____

City, State _____

Short Form Administered: ____English ____Spanish

STOFHLA - Score

TOFHLA Total Score:
Reading Comprehension Raw Score (0-36)

--

Functional Health Literacy Level:

0 - 16 -- Inadequate Functional Health Literacy

17 - 22 -- Marginal Functional Health Literacy

23 - 36 -- Adequate Functional Health Literacy

STOFHLA: Reading Comprehension
Scoring Key

14 Point Font

Passage A	Passage A	Passage A	Passage B	Passage B	Passage B
A1 a	A6 a	A12 c	B17 c	B24 d	B33 d
A2 b	A7 c	A13 b	B18 a	B25 b	B34 c
A3 d	A8 b	A14 c	B19 d	B26 c	B35 b
A4 a	A9 d	A15 d	B20 b	B27 d	B36 b
A5 c	A10 b	A16 a	B21 d	B28 d	
	A11 c		B22 c	B29 a	
			B23 a	B30 c	
				B31 b	
				B32 a	

Appendix E. Self-Care of Heart Failure Index

All answers are confidential.

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

SECTION A:

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

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

SECTION B:

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

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

The last time you had symptoms...

(circle **one** number)

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

SECTION C:

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

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

	Not Likely		Somewhat Likely		Very Likely
22. Further limit the salt you eat that day?	1	2	3	4	5
23. Reduce your fluid intake?	1	2	3	4	5

24. Take a medicine?	1	2	3	4	5
25. Call your healthcare provider for guidance?	1	2	3	4	5
26. Ask a family member or friend for advice?	1	2	3	4	5
27. Try to figure out why you have symptoms?	1	2	3	4	5
28. Limit your activity until you feel better?	1	2	3	4	5

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

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

SECTION D:

In general, how confident are you that you can:

(Circle **one** number for each statement)

	Not Confident		Somewhat Confident		Extreme Confident
Keep yourself <u>stable and free of symptoms</u> ?	1	2	3	4	5
<u>Follow the treatment plan</u> you have been given?	1	2	3	4	5
30. <u>Persist</u> in following the treatment plan even when difficult?	1	2	3	4	5
31. <u>Monitor your condition</u> routinely?	1	2	3	4	5
32. <u>Persist</u> in routinely monitoring your condition even when difficult?	1	2	3	4	5
33. <u>Recognize changes</u> in your health if they occur?	1	2	3	4	5

34. <u>Evaluate the importance</u> of your symptoms?	1	2	3	4	5
35. <u>Do something</u> to relieve your symptoms?	1	2	3	4	5
36. <u>Persist</u> in finding a remedy for your symptoms even when difficult?	1	2	3	4	5
37. <u>Evaluate</u> how well a remedy works?	1	2	3	4	5

Appendix F. Atlanta Heart Failure Knowledge Test

(Correct answers are marked with an asterisk)

We have some questions about heart failure. Select one response for each question. Don't worry if you are not sure of the answers; just do the best you can.

1. Heart failure is a problem in which: (Patho)

- a. There is too much blood in the body
- b. The heart is unable to pump enough blood *
- c. The blood vessels in the heart are clogged
- d. The heart skips beats

2. Which of the following statements about heart failure is TRUE? (Patho)

- a. It can be cured with drugs and other treatments.
- b. A person with heart failure cannot live a normal life.
- c. Heart failure cannot be cured but it can be controlled. *
- d. Heart failure means the heart has stopped beating.

People with heart failure can do many things to help themselves. Think about each of these activities and decide if they would be helpful for someone with heart failure.

	Yes	No
3. Weigh themselves everyday (behavior)	*	
4. Drink lots of fluids (nutrition)		*
5. Stop smoking (behavior)	*	
6. Drink alcoholic drinks each day to relax (behavior)		*
7. Skip heart failure medicines when they feel better (Medication)		*
8. Call their doctor to report loss of 2 pounds in 1 night (symptoms)		*

9. ACE inhibitors (ex. Capoten, Vasotec, Lisinopril, or Zestril) are medicines used to treat heart failure. These drugs help the heart pump stronger by: (medication)

- a. Slowing down the heart rate
- b. Causing blood vessels to get smaller
- c. Relaxing tight blood vessels and blocking salt retention*
- d. Improving blood counts (reducing anemia)

10. People who have heart failure take diuretics (Lasix, "water pills") so that: (medication)

- a. Their kidneys will make more urine and pass more water*
- b. Their heart will beat more steady
- c. The blood vessels in their body will widen or relax
- d. Their heart will pump stronger

11. People with heart failure who are taking a diuretic ("water pill") need to: (medication)

- a. Know if they need to take extra potassium with their water pill*
- b. Take the diuretic after 3-4 pm in the day
- c. Not worry about signs and symptoms of dehydration
- d. Drink lots of water to replace lost fluid

12. If a person with heart failure gains 2-3 pounds in a few days, this usually means he/she: (symptoms)

- a. Is eating too many calories and gaining weight
- b. Has extra water in the body*
- c. Needs to drink more fluid
- d. Needs to be getting more exercise to burn calories

13. Beta blocker medications (ex. Coreg, metoprolol, atenolol) are medicines used to treat heart failure. These drugs help the heart pump stronger by: (medication)

- a. Slowing down the heart rate*
- b. Causing blood vessels to get smaller
- c. Relaxing tight blood vessels and blocking salt retention
- d. Improving blood counts (reducing anemia)

14. The best time of day for persons with heart failure to weigh themselves is: (behavior)

- a. At bedtime
- b. Upon awakening in the morning*
- c. At or around lunchtime
- d. When they remember to do it

15. Persons with heart failure should call their doctor if they have which of the following symptoms? (symptoms)

- a. Weight gain of 2-5 pounds in 1-2 days
- b. Increased swelling of the ankles and/or stomach
- c. More shortness of breath
- d. All of the above*

16. Persons with heart failure should exercise: (behavior)

- a. To the point of breathlessness
- b. Most days of the week*
- c. Only at a slow pace that does not cause the heart rate to increase
- d. 1-2 times per week

17. A person with heart failure should stop and rest when doing physical activity if: (symptoms)

- a. They feel short of breath or winded
- b. They have chest pain or discomfort
- c. They feel dizzy or lightheaded
- d. All of the above*

18. Which is a big source of sodium (salt) in the diet? (nutrition)

- a. Processed foods (such as tv dinners)
- b. Smoked or cured meats
- c. Table salt
- d. All of the above*

19. Which has the LOWEST amount of sodium (salt)? (nutrition)

- a. Fresh fruits*
- b. Canned vegetables
- c. Reduced sodium soup
- d. Frozen dinners

20. Which food has the MOST sodium (salt)? (nutrition)

- a. Sliced tomato
- b. Broiled fish
- c. Baked ham*
- d. Skim milk

21. Which dessert has the LOWEST amount of sodium? (nutrition)

- a. Hot fudge sundae
- b. Baked apple*
- c. Low fat instant pudding made with skim milk
- d. Chocolate cake made from a mix

22. Select the fast food with the LOWEST amount of sodium. (nutrition)

- a. Fried chicken
- b. Cheeseburger
- c. Baked potato with sour cream and chives*
- d. Taco salad

23. Some people with heart failure are told by their doctor to limit fluids. Which of the following count as fluids? (nutrition)

- a. Water and clear liquids
- b. Milk, ice cream, and yogurt
- c. Jello, pudding, and soups
- d. All of the above*

24. If a person with heart failure has a headache or pain, which would be the best medicine to take? (medication)

- a. Aspirin
- b. Tylenol (Acetaminophen)*
- c. Advil® or Motrin® (Ibuprofen)
- d. Anacin Regular Strength or Excedrin

25. The recommended total daily amount of sodium that persons with heart failure should eat is:
(nutrition)

- a. Less than 3,000 milligrams*
- b. Greater than 4,000 milligrams
- c. 1,500 milligrams
- d. As close to 0 as possible

Use the picture of the soup label, to answer questions 26 and 27:

26. How many servings are in the can? (nutrition)

- a. 1
- b. 2 ½
- c. 2*
- d. 3

27. How much sodium is in one serving of soup? (nutrition)

- a. 40mg
- b. 950mg*
- c. 475mg
- d. 1900mg

28. A person with heart failure who is trying to limit their fluids may reduce symptoms of thirst by: (symptoms)

- a. Chewing gum or sucking hard candy*
- b. Cutting back on their medications
- c. Drinking small amounts every 30-60 minutes to prevent thirst
- d. Warming fluids before drinking

Nutrition Facts	
Serving Size 1 cup (237g)	
Servings Per Container about 2	
Amount Per Serving	
Calories 100	Calories from Fat 20
% Daily Value*	
Total Fat 2.5g	4%
Saturated Fat 0.5g	3%
Trans Fat 0g	
Polyunsaturated Fat 0.5g	
Monounsaturated Fat 1g	
Cholesterol 25mg	8%
Sodium 950mg	40%
Total Carbohydrate 12g	4%
Dietary Fiber 1g	4%
Sugars 1g	
Protein 7g	
Vitamin A 20%	Vitamin C 0%
Calcium 2%	Iron 4%
* Percent Daily Values are based on a 2,000 calorie diet.	

29. If a person with heart failure forgets to take their medicine, they should: (medication)

- a. Take their medicines as usual the next day
- b. Take the medicines as soon as remembered*
- c. Take double the dose the next day
- d. Call their doctor immediately

30. It is important for a person with heart failure to: (behavior)

- a. Make sure they get the flu shot every year
- b. Receive the pneumovax vaccination to prevent pneumonia
- c. See their heart failure doctor regularly
- d. All of the above*

Appendix G. Study Recruitment Flyer

**Do you need health information to manage
your Heart Failure?**

**A Doctor of Nursing Practice Candidate seeks
Adults ages 18 and older with Heart Failure for a
research study.**



The purpose of the *Using Video-Based Education to Address Health Literacy in Heart Failure* study is to assess the use of videos to improve self-management skills and knowledge in heart failure (HF) patients. The study will also tailor education and hopefully improve health outcomes. The study will involve questionnaires and 6-weeks of watching online heart failure videos (3 to 5 videos per week.) You may also opt into weekly consults with a health care professional. Videos can be accessed during patient appointments or in the comfort of your home with internet access.

Participants must be a patient at UVA or Augusta Health Heart & Vascular Outpatient Clinic.

If interested, please contact the lead researcher:

Paula Atueyi, MSN, FNP-BC
University of Virginia, School of Nursing
◦ **Email: pca7uw@virginia.edu**
◦ **Mobile: (410) 522-8636**
◦ **IRB-HSR # 21881**

Appendix H. Inclusion and Exclusion Criteria Checklist

Date: _____

Name of Reviewer: _____

Age of prospective participant: _____

Gender of prospective participant: M or F

Select the clinical location. (Circle ONE)

UVA Heart and Vascular Center

Augusta Health Heart and Vascular Center

Inclusion Criteria

(Note: Participants must meet ALL inclusion criteria to participate in the project.)

Inclusion Criteria	YES	NO
Diagnosed with heart failure		
Adult patient age 18 years or older		
Receiving care at UVA or AH HF clinic		
Internet access via computer, tablet, or smartphone		

Exclusion Criteria

(Note: selecting YES for any of the choices below will result in an automatic exclusion for the project.)

Exclusion Criteria	YES	NO
Diagnosed with *cognitive impairment		
Legally Blind		
Unable to read and write in English		
Unable to give voluntary consent		

*Cognitive impairment is any intellectual disability that affects one’s mental capacity to make decisions, learn new information, or process memory. (e.g. Dementia, Alzheimer’s disease, etc.)

Does the patient qualify for the study? **YES** **NO** **REFUSED** (Circle one)

If the patient refused, please indicate reasons why in the comments section.

Comments:

Appendix I. Recruitment Information Sheet

A University of Virginia, Doctor of Nursing Practice student is conducting a research study about using video-based education to address health literacy in heart failure patients.

You are being invited to be in this study because you are a patient at the UVA or Augusta Health Heart and Vascular Outpatient Clinic.

The purpose of this research study is to assess the use of videos to improve self-management skills and knowledge in heart failure patients. The study will also tailor patient education and hopefully improve health outcomes.

If you agree to participate, the study will involve completing the attached survey and the attached Stand-Alone HIPAA Authorization. We will also be collecting some information from your medical record such as your name, email address, telephone number, diagnosis of heart failure, and other health co morbidities (e.g. diabetes, high cholesterol).

Study participation is completely voluntary.

The only risk for this study is to your privacy. We will keep all of the information as secure and confidential as possible and in keeping with University of Virginia policies, and HIPAA Regulations.

You will not directly benefit from this study but future patients with your type of condition may benefit from what we learn in this study.

If you feel you understand the study and would like to participate, please complete the attached survey and HIPAA Authorization Form and submit the completed forms to the primary research investigator or designated study team member.

Any questions about this research may be addressed to the primary research investigator, Paula Atueyi, MSN, RN.

For questions about your rights as a research participant, complaints about this research, or research-related injury, you can contact the Office of the Vice President for Research (VPR) at (434) 924-6853 and leave a message. A member of the VPR staff will contact you to address your questions or concern.

Your information will not be shared outside of this study team except to those groups inside and outside of UVA who are responsible for making sure studies are conducted correctly and ethically. If you decide to participate in this study now, but decide later to stop, you need to know that the information already collected will continue to be used.

Thank you for your time,

Paula Atueyi

Principal Investigator: Paula Atueyi

Study Title: Utilizing Video-Based Education to Address Health Literacy in Heart Failure Patients

IRB-HSR #21881

Appendix J. HIPAA Authorization Form

University of Virginia IRB-HSR# 21881

Title: Utilizing Video-Based Education to Address Health Literacy in Heart Failure Patients

HIPAA Authorization
Confidentiality, Use and Disclosure of Health Information
for Research Purposes

Study records that identify you will be kept confidential as required by federal privacy regulations. By signing this form, you agree to allow Paula Atueyi and their study team to use and disclose health information about you to conduct this study. A description of this study is attached to this form.

The information created about you may be shared with other institutions doing this study in a way that does not identify you directly. Other persons who may have access to your records include groups such as

- data and safety monitoring boards which oversee the safety of a study including accrediting agencies,
- the University of Virginia Research Compliance staff and Institutional Review Board (IRB) members or designates. The IRB is a special committee at the University of Virginia that reviews all medical research studies involving human participants.

If you sign this form, you have given us permission to release information to these other people. There is no expiration date to this permission. If you decide to withdraw your permission and end this agreement to release the information collected about you, please contact Paula Atueyi via cell phone (410) 522-8636 or email pea7uw@virginia.edu. She will help you document in writing your decision to withdraw this permission. Please note that any information already obtained will continue to be used.

Because of the need to release information to these parties, absolute confidentiality cannot be guaranteed. There is the potential that information released to the groups and individuals listed above may be released again and would no longer be protected by privacy laws.

Your participation in this research study is voluntary. However, you will not be allowed to participate in this research if you do not sign this Authorization. Refusing to sign will not affect the present or future care you receive at this institution.

Adult Participant

_____ PARTICIPANT (Signature)	_____ PARTICIPANT DATE (Print)
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Minor Participant

MINOR'S NAME

MINOR'S PARENT or GUARDIAN MINOR'S PARENT or
GUARDIAN DATE
(Signature) (Print)

Impartial Witness

If this form is read to the subject because the subject is blind or illiterate, an impartial witness not affiliated with the research or study team must be present for the authorization process and sign the following statement.

The subject may place an X on the Participant Signature line above.

I agree the information in this form was presented orally in my presence and the person had the opportunity to ask questions. I also agree that the person freely gave their authorization to allow the release of their health information.

NAME OF IMPARTIAL WITNESS

SIGNATURE OF IMPARTIAL WITNESS
DATE

Appendix K. Demographic Data Collection Sheet

All answers will be kept confidential.

Name/Participant ID number: _____ Date: _____

Telephone: home or mobile () _____ - _____ Best Time to Call: _____

Email address: _____ Preferred Contact Method: _____

1. Please indicate your age.

2. Please select your gender.

- a. Male
- b. Female

3. Please select your race.

- a. Black
- b. White
- c. Hispanic
- d. Asian
- e. Native American
- f. Other: _____

4. Please select your level of education.

- a. Did not complete high school
- b. High school graduate/GED
- c. Completed some college
- d. College Graduate

- e. Masters or Doctorate degree

5. Please select your employment status.

- a. Unemployed
- b. Employed
- c. Retired
- d. Disabled

6. Please select your relationship status.

- a. Single
- b. Married
- c. Divorced

7. Please select your annual income.

- a. \$0 - \$20,000
- b. \$21,000 - \$50,000
- c. \$50,000 - \$74,000
- d. \$75,000 or more

8. Please indicate your class of heart failure.

- a. Class I: No limitation of physical activity.
- b. Class II: Slight limitation of physical activity. Comfortable at rest but, ordinary physical activity causes shortness of breath.
- c. Class III: Marked limitation of physical activity. Comfortable at rest. Less than ordinary activity causes shortness of breath.
- d. Class IV: Unable to carry on any physical activity without discomfort. Symptoms of heart failure at rest.
- e. Not sure

9. Please select your type of heart failure

- a. Systolic
- b. Diastolic

- c. C. Not sure

10. Please select your ejection fraction percentage

- a. Less than or equal to 40%
- b. Between 41-49%
- c. Greater than 50%
- d. Not sure


11. Please list all active medical issues (i.e. high blood pressure, diabetes)

Appendix L. HF Clinic Project Presentation

Assessing Health Literacy to Improve Heart Failure Self-Management through Video-Based Education Counseling

A DNP Scholarly Practice Project

Paula C. Atuey, MSN, FNP-BC
 DNP Advisor: Dr. Kathryn Reid, PhD, FNP-C, RN, CNL
 Practice Mentors: Craig Thomas, MSN, ACNP-BC, CHFN
 Tami Collins, MSN, AGACNP-BC, CHFN
 October 2019





Contents

1. Background/Significance
2. Project Objectives
3. Overview of Project
4. Project Eligibility
5. Methodology/Procedures
6. Sustainability of Project
7. Nursing Implications

Background



- HF affects 6.5 million Americans in the U.S. (AHA, 2017).
- Morbidity and mortality rates still remain high (van Riet et al., 2016).
- Self-care regimens for HF patients are complex and multifaceted (Boyne et al., 2014, Yancey et al., 2013).
- Low health literacy is a barrier to effective self-management in HF (Cajita, Cajita, & Han, 2016).
- No Gold Standard in educating for HF patients (Boyde & Peters, 2014).
- UVA-HS and AH HF clinic current mode of education is primarily oral and written materials.
- HFSA recommends assessment of health literacy and the use of various learning options including videos (Peterson et al. 2011).



Project Objectives

To evaluate the effectiveness of using video-based education (VBE) counseling to improve self-care and heart failure (HF) knowledge in HF patients.

To examine the differences between limited and adequate health literacy groups in improving self-care behaviors and HF knowledge after receiving VBE counseling.





Project Overview

<p>Institutional Review Board Status: Open to enrollment (IRB-HSR #21881)</p> <p>Start date: October 2019</p> <p>Timeframe: 6 weeks</p> <p>Study Design: one group pretest-posttest design</p>	<p>Clinical impact?</p> <ul style="list-style-type: none"> - Cost efficient - Accurately identifies those with limited health literacy and tailors patient education to their learning needs. - Patients have online access to an underutilized educational resource. - 80 % of information is absorbed visually, helpful for retention and comprehension.
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Inclusion and Exclusion Criteria

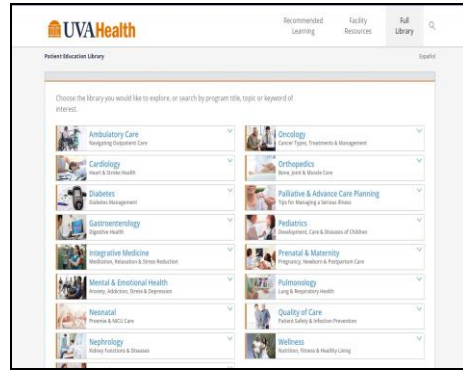
<p>Inclusion</p> <ul style="list-style-type: none"> • Adult patients 18 years or older • Diagnosis of HF (per ACC/AHA or NYHA guidelines) • All health literacy scores post screening (low, marg., adeq.) • Patients with internet access via PC, tablet, or smartphone 	<p>Exclusion</p> <ul style="list-style-type: none"> • Patients with cognitive impairment. • Patients who are medically certified as blind. • Unable to read or write in English, or unable to give consent.
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Methodology and Procedures

- **Pre-intervention**
 - Recruitment at HF clinic
 - Staff meeting to introduce study
 - Eligible participants enrolled. Obtain informed consent.
 - Data collection: Baseline S-TOPFHLA scores and pretest SCHFI and AHFKT, demographics, and clinical data
- **Intervention**
 - Enroll for individualized weekly support
 - VBE pamphlet and tracking log
 - VBE delivery at clinic or home
 - Monitor patients specifically for educational needs and health concerns.
- **Post-intervention**
 - Participants will be contacted to complete post-test SCHFI and AHFKT.






Sustainability of the Project

- Gain staff engagement: Identify clinic champions/leaders and practice experts for ongoing use of VBE.
- Discuss HL screening and VBE at staff meetings.
- Give each visiting patient a project study flyer during recruitment and educate them about VBE for HF.
- Incorporate video education during 30 min-1 hour patient appointments (e.g. exam room).
- Encourage patients to watch videos after health visit. Follow up w/ enrolled pts.
- Identify and address challenges or barriers to VBE.

Nursing Implications

- Aims to enhance patient education delivery in an outpatient setting.
- Can saving nursing/provider time and increase efficiency.
- Provides continued education after health visit.
- VBE may empower patients to take more responsibility of their health.
- Increases awareness of health literacy and integrates an evidence-based educational tool to individualize care.
- Enhances nursing and provider role by improving communication and providing patient-centered care.



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Appendix M. Heart Failure Video Education Content

Heart Failure Basics






Medications Used to Treat Heart Failure
What is Heart Failure?
Self-Check Plan for HF Management (pdf file)
Managing Your Heart Failure Medications
What is Heart Failure? (pdf file)
Monitoring Symptoms of Heart Failure
Common Tests for Heart Failure
What is a Heart Failure Treatment Plan?
Preparing for Your Doctor's Appointments When You Have Heart Failure
Heart Failure: Making Lifestyle Changes
Heart Failure: Partnering in Your Treatment (pdf file)
HF and Your Ejection Fraction Explained (pdf file)
How Can I Improve My Low Ejection Fraction (pdf file)
Understanding Your Heart's Ejection Fraction
Understanding Ejection Fraction
Heart Failure Warning Signs and Symptoms
Treating Heart Failure: Medications, Devices, and Surgery
Treating Heart Failure: Left Ventricular Assist Devices
Heart Failure: Preparing for Discharge
Your Care at Home: Managing Heart Failure

Living with Heart Failure: Building a Support Network
How to Handle a Heart Failure Flare-Up
Emotions of Heart Failure
Heart Failure: Questions to Ask Your Doctor (pdf file)
Tobacco and Heart Failure: Tips for Quitting
How Can I Live With Heart Failure?
Heart Failure: Symptom Tracker (pdf file)

Heart Failure Lifestyle Changes

Living with Heart Failure: Your Heart-Healthy Diet
Living with Heart Failure: Goals for the Future
Living with Heart Failure: Strategies to Reduce Sodium
Managing Heart Failure: Beware of Fat and Cholesterol
Living with Heart Failure: Reading Nutrition Labels
Managing Heart Failure: Dining Out
Living with Heart Failure: Fluid Guidelines
Living with Heart Failure: Exercising Safely
What Your Heart Failure Diagnosis Means
Avoiding Hospital Readmissions: Heart Failure (Part 1)
Avoiding Hospital Readmissions: Heart Failure (Part 2)
Avoiding Hospital Readmissions: Heart Failure (Part 3)
Avoiding Hospital Readmissions: Heart Failure (Part 4)

Appendix N. Video-Based Education Brochure

 <p>DID YOU KNOW?</p> <p>80% of information is absorbed visually by the brain. Video education can enhance retention and comprehension of health information.</p>	<p>CONTACT</p> <p>This brochure was developed by Paula Atueyi, MSN, FNP-BC Doctor of Nursing Practice-2020 University of Virginia, SON pca7uw@virginia.edu</p> 	<p>IMPROVING YOUR HEART HEALTH WITH VIDEOS</p> <p>Providing the highest quality of care for our patients</p>
 <p>WHAT IS VIDEO EDUCATION?</p> <p>Video education is the use of audio-visual recording technology that helps learners to explore and increase their knowledge about a topic. There are many educational videos available online.</p> <p>WHY VIDEO EDUCATION FOR HEART FAILURE?</p> <ul style="list-style-type: none"> • Videos can help you learn how heart failure (HF) affects your body. • Videos can improve your HF knowledge and self-care behaviors • Videos can help you make lifestyle changes such as limiting sodium, taking new medications, and staying active. 	 <p>VISIT UVA.HEALTHCLIPS.COM</p> <ul style="list-style-type: none"> • GO TO FULL LIBRARY • CLICK CARDIOLOGY • CLICK HEART FAILURE • YOU NOW HAVE FREE ACCESS TO EDUCATIONAL HF VIDEOS! • WATCH 3 TO 5 VIDEOS PER WEEK. 	<p>RECOMMENDED VIDEOS</p> <p>HEART FAILURE BASICS</p> <ul style="list-style-type: none"> • "What is Heart Failure?" • "Monitoring Symptoms of Heart Failure" • "Managing your HF Medications" • "How to Handle a HF Flare-Up" • "HF Warning Signs and Symptoms" <p>HEART FAILURE LIFESTYLE CHANGES</p> <ul style="list-style-type: none"> • "Your Heart Healthy Diet" • "Strategies to Reduce Sodium" • "Fluid Guidelines" • "Reading Nutrition Labels" • "Avoiding Hospital Readmissions" • "Exercising Safely" 

Appendix O. Video-Based Education Tracking Log
Video-Based Education Tracking Log

Instructions: **Congratulations!** You are taking great steps towards managing your health. Please use this tracking log and your video-based education pamphlet to guide you. You have free unlimited access to watch heart failure education videos online.

How can I access the online videos?

1. Open up your chosen internet browser and visit uva.healthclips.com
2. Click **Full Library** at the upper right-hand corner of the screen. You will see a list of library categories to explore.
3. On the library list to your left, click **Cardiology** (Heart and Stroke Health). This is located underneath Ambulatory Care.
4. After clicking cardiology, a list of sub-categories will appear. Click **Heart Failure**.
5. You now have access to the **Heart Failure Basics** and **Heart Failure Lifestyle Changes** videos. Start with Heart Failure Basics and watch the “*What is Heart Failure?*” video.
6. You will see a list of all the educational videos on the right-hand side. It is encouraged that you watch at least 3 heart failure videos per week.

Study Week (circle one): 1 2 3 4 5 6 7 8 9 10

Number of videos watched this week (circle one): 1 2 3 4 5 6 7 8 9 10

Notes: *(Use this section to write down video title, health information, or questions)*

Appendix P. UVA Institutional Review Board Assurance Form

ASSURANCE FORM

University of Virginia

Institutional Review Board for Health Sciences Research

HIPAA Privacy Board

IRB - HSR # 21881	
Event: Type: Determination of Exempt Research Protocol with Limited IRB Review - Exempt with Limited IRB Review	
Sponsor(s):	
Sponsor Protocol #:	
Principal Investigator: Paula Atueyi, BSN, MSN	
Title: Utilizing Video-Based Education to Address Health Literacy in Heart Failure Patients	
Assurance: Federal Wide Assurance (FWA)#: 00006183 UVa IRB #1 Registration IRB#00000447	
Certification of IRB Review: The IRB-HSR/HIPAA Privacy Board abides by 21CFR50, 21CFR56, 45CFR46, 45CFR160, 45CFR164, 32CFR219 and ICH guidelines as compatible with FDA and DHHS regulations. This activity has been reviewed in accordance with these regulations.	
Event Date: 09/23/19	
Protocol Expiration Date: 09/23/23	
Number of Subjects:	
UVA Site Only	
Data Security Plan Date: 09/19/19	
Current Status: Open to enrollment	
Consent Version Dates:	

HIPAA Authorization Stand Alone Form -- 09/19/19

Committee Members (did not vote):

Comments: The purpose of this study is to enhance patient education by using video-based education (VBE) to improve self-care behaviors and heart failure (HF) knowledge in adult HF patients.

The study will involve recruitment and enrollment of patients with Heart failure who will engage in the educational program, and complete pre and post assessments. The study also involves gleaning identifiable information from the medical record.

There is no outside sponsor for this study.

The following documents were submitted with this protocol:

1. Patient Demographics Data Sheet
2. Pre VBE Short Test pf Functional Health Literacy in Adults.
2. Pre VBE Self Care of Heart Failure Index.
3. Pre VBE Atlanta Heart Failure Knowledge Test
4. Post VBE Self Care of Heart Failure Index.
5. Post VBE Atlanta Heart Failure Knowledge Test

This study was submitted initially as QI and reviewed by the IRBHSR QI Committee who determined this

project met the criteria for Human Subject Research.

This study is now open to enrollment.

REGULATORY INFORMATION:

PRE AND POST VBE evaluations

CATEGORY # 2(i)

This study met the criteria for an exempt determination per 45CFR46.104(d)2(i).

Research that includes only interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures,

interview procedures, or observation of public behavior (including visual or auditory recording) and (i) the information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

PROJECT DEMOGRAPHICS DATA SHEET (INTERVIEW PORTION)

CATEGORY # 2(iii)

This study met the criteria for an exempt determination per 45CFR46.104(d)2(iii).

Research that includes only interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) and (iii) the information obtained is recorded by the investigator in such a manner that the identity of human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited review to make the determination required by 45 CFR 46.111(a)(7) .

Per 45CFR46.110(b)(iii) the IRB conducted an expedited limited IRB review required by 45CFR46.111(a)(7) and determined that the study provides an adequate plan to protect the privacy of subjects and the confidentiality of their information.

VIDEO-BASED EDUCATIONAL INTERVENTION CATEGORY # 3(ii) For the purpose of this provision, benign behavioral interventions are brief in duration, harmless, painless, not physically invasive, not likely to have a significant adverse lasting impact on the subjects, and the investigator has no reason to think the subjects will find the interventions offensive or embarrassing. Provided all such criteria are met, examples of such benign behavioral interventions would include having the subjects play an online game, having them solve puzzles under various noise conditions, or having them decide how to allocate a nominal amount of received cash between themselves and someone else.

PROJECT DEMOGRAPHICS DATA SHEET (MEDICAL RECORD REVIEW)

CATEGORY # 4(iii)

This study met the criteria for an exempt determination per 45CFR46.104(d)4(iii).

Secondary research for which consent is not required: Secondary research uses of identifiable private information or identifiable biospecimens, and (iii) The research involves only information collection and analysis involving the investigator's use of identifiable

health information when that use is regulated under 45CFRparts 160 and 164, subparts A and E, for the purposes of 'health care operations' or 'research' as those terms are defined at 45CFR164.501 or for 'public health activities and purposes' as described under 45CFR164.512 (b).

HIPAA REGULATIONS:

The IRB-HSR has granted Waiver of HIPAA Authorization via 45CFR 164.512(i)(2) to contact subjects by direct contact by a person who is not their health care provider. Direct contact may include phone, letter, direct email or approaching potential subjects while at UVA. Phone, letter or emails will be approved by

the IRB-HSR prior to use. The following HIPAA identifiers may be collected: Name, medical record number, date of birth and contact information appropriate to the recruitment plan. The minimum necessary PHI to be collected includes only those items related to the inclusion/ exclusion criteria.

The health information to be collected per the PROJECT DEMOGRAPHICS DATA SHEET in meets the criteria of Identifiable per HIPAA regulations. The collection of identifiable health information at UVA will be done under a written HIPAA Authorization. Sharing of the identifiable health information outside of UVA will be authorized under a signed study specific HIPAA Authorization: English Version.

Health Information collected in the PRE AND POST EVALUATION portions of the study meet the criteria of deidentified under HIPAA.

Any health information shared outside of UVA will be de-identified.

Approved with this determination are the following recruitment material(s):

1. Flyer dated 09-19-19
2. Information Sheet-Recruitment Information for Exempt with Written HIPAA Authorization dated

09-19-19

RECEIVING FROM OR SENDING DATA/SPECIMENS EXTERNAL TO UVA

You are required to consult with your office of grants and contracts to determine if an agreement is required to receive data/specimens from outside UVA or to send data/specimens outside of UVA.

DATA PROTECTION

You are required to protect the data according to the enclosed Privacy Plan and the Data Security Plan.

PERSONNEL CHANGES

You must notify the IRB of any new personnel working on the study PRIOR to them beginning work.

MODIFICATIONS

If you need to modify the procedures in this study, you must submit an email to IRBHRSR@virginia.edu describing the changes before they are implemented. If changes will affect the Exempt application, send the changes with tracked changes to the document.

The IRB-HSR will determine if the project continues to meet the criteria for exempt research.

CLOSURE

Send an email to IRBHRSRadmin@virginia.edu within 30 days of closing this study. Include the IRB-HSR# or UVA Study Tracking # of this study in the email. An IRB-HSR Closure Form is not required.

ADDITIONAL INFORMATION

See educational resources for research
<http://www.virginia.edu/vpr/irb/hsr/education.html>

The IRB-HSR official noted below certifies that the information provided above is correct and that, as required, future reviews will be performed and certification will be provided.

Name: Karen Mills, RN

Title: Experienced Designated Member of the IRB-HSR, Institutional Review Board for Health Sciences Research

Phone: 434-924-9634 Fax: 434-924-2932

Name and Address of Institution: IRB for Health Sciences
 Research University of Virginia, PO Box 800483
 Charlottesville, VA 22908

OR

IRB for Health Sciences Research

One Morton Drive, Suite 400

Charlottesville, VA 22903

Approval: Approved by Karen Mills, RN From IP Address: 128.143.1.125	Date: 09/23/19 at 02:29 PM
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Appendix Q: Journal Guidelines

The Journal of Cardiac Failure

Your Paper Your Way

We now differentiate between the requirements for new and revised submissions. You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.

Introduction

The *Journal of Cardiac Failure* publishes peer-reviewed manuscripts of interest to clinicians and researchers in the field of heart failure and related disciplines. These include original communications of scientific importance and review articles involving clinical research, health services and outcomes research, animal studies, and bench research with potential clinical applications to heart failure. The Journal also publishes manuscripts that report the design of ongoing clinical trials and editorial perspectives that comment on new developments pertinent to the field of heart failure or manuscripts published in other journals.

Contact details

Authors may send queries concerning the submission process, manuscript status, or journal procedures to the Editorial Office, aleong@hfsa.org.

Submission checklist

You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:

- E-mail address
- Full postal address

All necessary files have been uploaded:

Manuscript:

- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided

- Indicate clearly if color should be used for any figures in print
Graphical Abstracts / Highlights files (where applicable)
Supplemental files (where applicable)

Further considerations

- Manuscript has been 'spell checked' and 'grammar checked'
- All references mentioned in the Reference List are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources (including the Internet)
- A competing interests statement is provided, even if the authors have no competing interests to declare
- Journal policies detailed in this guide have been reviewed
- Referee suggestions and contact details provided, based on journal requirements

Ethics in publishing

Please see our information pages on [Ethics in publishing](#) and [Ethical guidelines for journal publication](#).

Human and animal rights

Published research must be in compliance with human studies guidelines and animal welfare regulations. Authors should indicate in the manuscript that human subjects have given informed consent and that the institutional committee on human research has approved the study protocol. Similarly, they should indicate that studies involving experimental animals conform to institutional standards.

Conflict of interest

If a potential conflict exists, its nature should be stated for each author and the information should be outlined in the Disclosure section of the manuscript. When there is a stated potential conflict of interest and the editors consider that it may have relevance to the accompanying paper, a footnote will be added indicating the author(s)' equity interest in or other affiliation with the identified commercial firms.

All potential conflicts of interest must be identified within the text of the manuscript, under the conflicts with interest heading. This includes relationships with pharmaceutical and biomedical device companies or other corporations whose products or services are related to the subject matter of the article. Such relationships include, but are not limited to, employment by an industrial concern, equity or stock ownership by authors or family member, membership on a standing advisory council or committee, being on the board of directors or publicly associated with the company or its products. Other areas of real or perceived conflict of interest could include receipt of honoraria or consulting fees or receiving grants or funds from such corporations or individuals representing such corporations. See also <https://www.elsevier.com/conflictsofinterest>. Further information and an example of a Conflict of Interest form can be found at:

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Submission form

Original works will be accepted with the understanding that they are contributed solely to the *Journal of Cardiac Failure*, are not under review by another publication, and have not previously been published except in abstract form. Accepted manuscripts become the sole property of the journal and may not be published elsewhere without the consent of the *Journal of Cardiac Failure*. A form stating that the authors transfer all copyright ownership to the journal will be sent from the publisher when the manuscript is accepted; this form must be signed by all authors of the article.

The submission form includes three statements: (1) that there has been no duplicate publication or submission elsewhere of any part of the work (excluding abstracts), (2) that all authors have read and approved the manuscript, and (3) that there are no financial or other relations that could lead to a conflict of interest. This form must be downloaded, signed by all authors, and faxed to the editorial office.

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Contributors

Each author is required to declare his or her individual contribution to the article: all authors must have materially participated in the research and/or article preparation, so roles for all authors should be described. The statement that all authors have approved the final article should be true and included in the disclosure.

Authorship

All authors should have made substantial contributions to all of the following: (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted.

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The Journal of Cardiac Failure uses an online, electronic submission system. By accessing the website <https://www.evise.com/profile/api/navigate/cardfail> authors will be guided stepwise through the creation and uploading of the various files. When submitting a manuscript to the Elsevier Editorial System, authors need to provide an electronic version of their manuscript. For this purpose original source files, not PDF files, are preferred. The author should specify a category designation for the manuscript (original investigation, review article, brief communication, etc.) and choose a set of classifications from the prescribed list provided online. Once the submission files are uploaded, the system automatically generates an electronic (PDF) proof, which is then used for reviewing. All correspondence, including the editor's decision and request for revisions, will be by e-mail.

Submit your article

Please submit your article via <https://www.evise.com/profile/api/navigate/cardfail>.



Preparation

NEW SUBMISSIONS

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As part of the Your Paper Your Way service, you may choose to submit your manuscript as a single file to be used in the refereeing process. This can be a PDF file or a Word document, in any format or lay-out that can be used by referees to evaluate your manuscript. It should contain high enough quality figures for refereeing. If you prefer to do so, you may still provide all or some of the source files at the initial submission.

Please note that individual figure files larger than 10 MB must be uploaded separately.

References

There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the article number or pagination must be present. Use of DOI

is highly encouraged. The reference style used by the journal will be applied to the accepted article by Elsevier at the proof stage. Note that missing data will be highlighted at proof stage for the author to correct.

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There are no strict formatting requirements but all manuscripts must contain the essential elements needed to convey your manuscript, for example Abstract, Keywords, Introduction, Materials and Methods, Results, Conclusions, Artwork and Tables with Captions.

If your article includes any Videos and/or other Supplementary material, this should be included in your initial submission for peer review purposes.

Divide the article into clearly defined sections.

New manuscript submission categories added

Research Letters: Brief communication of preliminary research findings, novel observations, or additional analyses relevant to prior publications in the Journal (limits: 750 words of text, 1 graphic, 10 references)

Brief Reports: These are short communications of research findings, including pilot studies, preliminary observations in a small sample of subjects, or reports of novel assessment tools, diagnostic or treatment methodologies, or approaches to health care delivery. (Limits: 1500 words of text, 3 graphics, 15 references)

Figures and tables embedded in text

Please ensure the figures and the tables included in the single file are placed next to the relevant text in the manuscript, rather than at the bottom or the top of the file. The corresponding caption should be placed directly below the figure or table.

Peer review

This journal operates a single blind review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of one independent expert reviewer to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. [More information on types of peer review.](#)

REVISED SUBMISSIONS

Use of word processing software

Regardless of the file format of the original submission, at revision you must provide us with an editable file of the entire article. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the [Guide to Publishing with Elsevier](#)). See also the section on Electronic artwork.

To avoid unnecessary errors, you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

Subdivision - unnumbered sections

Divide your article into clearly defined sections. Each subsection is given a brief heading. Each heading should appear on its own separate line. Subsections should be used as much as possible when cross-referencing text: refer to the subsection by heading as opposed to simply 'the text'.

Divide your article into clearly defined sections. Each subsection should have a brief heading that appears on a separate line. Subsections should be used as much as possible when cross-referencing text: refer to the subsection by heading as opposed to simply "the text".

Introduction

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results. The Introduction should describe the purpose of the study and its relation to previous work in the field; it should not include an extensive literature review.

Material and methods

Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

Results

Results should be clear and concise and present positive and relevant negative findings of the study, supported when necessary by reference to tables and figures.

Discussion

The Discussion should interpret the results of the study, with emphasis on their relation to the original hypotheses and to previous studies. The importance of the study and its limitations should also be discussed.

Conclusions

The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

Essential title page information

- **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible. Include a short title of less than 40 characters.
- **Author names and affiliations.** Where the family name may be ambiguous (e.g., a double name), please indicate correct presentation clearly. Present the authors'

affiliation addresses (where the actual work was done) below the names. Include academic degrees for each author. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.

- ***Corresponding author.*** Clearly indicate who will handle correspondence at all stages of review and publication, also post-publication. **Ensure that phone numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address. Contact details must be kept up to date by the corresponding author.**

- ***Present/permanent address.*** If an author has moved since the work described in the article was done, or was visiting at the time, a "Present address" (or "Permanent address") may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

Highlights

Highlights are mandatory for this journal as they help increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: [example Highlights](#).

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

Abstract

A structured abstract, by means of appropriate headings, should provide the context or background for the research and should state its purpose, basic procedures (selection of study subjects or laboratory animals, observational and analytical methods), main findings (giving specific effect sizes and their statistical significance, if possible), and principal conclusions. It should emphasize new and important aspects of the study or observations. The abstract should be no more than 200 words. The structured headings to include are as follows: Background, Methods and Results, and Conclusions. In the Background section, describe the rationale for the study. In Methods and Results, briefly describe the methods and present the significant results. In Conclusions, state succinctly the interpretation of the data.

Graphical abstract

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5

× 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. You can view [Example Graphical Abstracts](#) on our information site.

Authors can make use of Elsevier's [Illustration Services](#) to ensure the best presentation of their images and in accordance with all technical requirements.

Keywords

Immediately after the abstract, provide a maximum of 4 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, "and", "of"). Be sparing with abbreviations: only abbreviations firmly established in the field may be used. These keywords will be used for indexing purposes.

Abbreviations

Define abbreviations that are not standard in the field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

Units

Follow internationally accepted rules and conventions: use the international system of units (SI). If other units are mentioned, please give their equivalent in SI.

Math formulae

Please submit math equations as editable text and not as images. Present simple formulae in line with normal text where possible and use the solidus (/) instead of a horizontal line for small fractional terms, e.g., X/Y. In principle, variables are to be presented in italics. Powers of e are often more conveniently denoted by exp. Number consecutively any equations that have to be displayed separately from the text (if referred to explicitly in the text).

Footnotes

Footnotes should be used sparingly. Number them consecutively throughout the article. Many word processors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article.

Artwork

Electronic artwork

General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Preferred fonts: Arial (or Helvetica), Times New Roman (or Times), Symbol, Courier.
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Appendix R. Manuscript

Assessing Health Literacy to Improve Heart Failure Self-Management through Video-Based
Education Counseling

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Abstract

Background: The Heart Failure Society of America recommends assessment of health literacy in heart failure (HF) patients and the use of various learning options such as videos. Health literacy affects an individual's ability to engage in self-care and chronic disease management. Self-care regimens in HF are complex, which requires consistent educational resources and patient-centered approaches. Tailored interventions using video-based education (VBE) may represent as a strategy to improve disease management in HF patients with literacy deficits. The purpose of this project was to evaluate the effectiveness of VBE counseling on improving self-management and knowledge in adult HF patients in an outpatient setting. Differences were examined between limited and adequate health literacy groups in improving self-management skills and HF knowledge after receiving VBE counseling.

Methods: A one-group pretest-posttest design was used in a convenience sample of fifteen participants from two outpatient HF clinics. Ten participants completed the six-week study. Participants enrolled for individualized weekly counseling support consisting of health literacy screening, a VBE brochure, HF VBE access via tablet or personal computer, and 15-30-minute telephone consultations and face-to-face education sessions with a healthcare provider. Four questionnaires were used to collect the data: a demographic questionnaire, the Short Test of Functional Health Literacy in Adults, the Self-Care of HF Index v. 7.2, and the Atlanta HF Knowledge Test.

Results: Post-intervention scores in HF knowledge increased ($p = .011$). Self-care management ($p = .005$) and symptom perception also increased ($p = .021$). Self-care maintenance ($p = .003$) and self-care confidence scores ($p = .015$) were significant respectively. Post-intervention scores

in self-care management ($p = .033$) and self-care confidence ($p = .017$) were significant between the health literacy groups.

Conclusion: VBE counseling was effective for improving HF self-management and knowledge for adult HF patients with limited or adequate health literacy. Health literacy screening may help providers to identify patients who require more educational support for disease management. VBE may be considered as an important adjunct to support HF self-care in outpatient settings.

Keywords: heart failure, health literacy, self-management, video-based education

Assessing Health Literacy to Improve Heart Failure Self-Management through Video-Based
Education Counseling

Heart Failure (HF) is an epidemic health problem that affects more than six million individuals in the United States (Yancey et al., 2013). Nearly eight million Americans are estimated to live with HF by 2030 (Benjamin et al., 2017). Almost 1.4 million persons with HF are under 60 years of age and more than 5% of persons age 60-69 have HF (Yancey et al., 2013). HF is a progressive disease in which the heart's muscle becomes too weak or stiff to pump enough blood to supply the body's needs (Yancey et al., 2013). Cardiovascular conditions such as high blood pressure, coronary artery disease, or myocardial infarction can injure the heart muscle and contribute towards the development of HF. Over time, this condition worsens and patients begin to experience physiologic complications that decrease the quality of life.

According to a report by the American Heart Association (AHA), HF causes one out of every nine deaths (Benjamin et al., 2017; Pekmezaris et al. 2018). HF is a financial burden on the health care system and accounts for \$31 billion of annual medical care costs (Yancey et al., 2013). It is the number one cause of hospitalizations in the Medicare population and the total cost of care is expected to rise from \$31 billion to \$70 billion in 2030 (Benjamin et al., 2017). The fifteen-year mortality rate still is 71.8% for men and 39.1% for women despite innovative therapies and care practices (van Riet, Hoes, Wagenaar, Limburg, Landman, & Rutten, 2016). Unfortunately, more than half of those who develop end-stage HF die within five years of diagnosis (Yancey et al., 2013). The high mortality rate caused by HF subsequently challenges the efforts of the healthcare system to improve health outcomes.

In 2013, the American College of Cardiology (ACC) and the American Heart Association (AHA) introduced guidelines to direct health care professionals to make appropriate decisions in

managing the care of HF patients. These guidelines received a focused update in 2017. Studies have shown that HF patients treated with ACC/AHA guideline-recommended therapies have been associated with a 13% lower risk of death and increases the likelihood of survival (Yancey et al., 2013). The ACC/AHA guideline recommends that patients with HF should receive specific education to facilitate HF self-care (Benjamin et al., 2017). Self-care can be defined as a decision-making process involving the choice of behaviors that maintain physiologic stability and the response to symptoms when they occur (Riegel et al., 2010). Yancey et al. (2013) emphasize that self-care education is a process measure that is recommended for patients' plan of care. Self-care regimens for HF patient are typically complex and multifaceted, therefore requiring consistent access to adequate health care resources and a variety of educational materials (Boyne et al., 2014; Yancey et al., 2013; Savarese & Lund, 2017).

In addition to improving HF self-care education, health literacy is also one of the major components to effectively treat HF (Cajita, Cajita, & Han, 2016). Health literacy can be defined as the patients' degree of gaining access, processing, and understanding health information, which plays a key role in making informed decisions concerning their health (Wonggoom, Du, & Clark, 2018). According to the National Assessment of Adult Literacy, only 12% of English-speaking adults have proficient health literacy, which denotes that nearly nine out of ten adults may lack the skills needed to manage their health and prevent disease (Kutner, 2006). The U.S. Department of Health and Human Services (HSS) states that health literacy affects people's ability to engage in self-care and chronic disease management, navigate the health care system, locate providers or health services, understand probability or risk concepts, and share personal information for health histories (Kutner et al., 2006). Studies of individuals with HF indicate that readmission rates, emergency room visits, and mortality rates are high amongst those with low

health literacy (Moser et al., 2015; McNaughton et al., 2015). As a result, HF is difficult to manage effectively if patients are not in a position to adhere to medical recommendations or modify self-management behaviors.

The Heart Failure Society of America recommends that a patient's health literacy level should be acknowledged and documented in their medical record (Evangelista et al., 2010). Limited health literacy amongst HF patients has been associated with poor health outcomes such as higher rates of readmissions and less frequent use of preventive services (Kutner, 2006). HF patients with low health literacy comprises of 27% to 54% of the HF population (Evangelista et al., 2010). Many healthcare providers may be unaware of literacy problems in their patients and view health illiteracy as a minor issue among their patients, though statistics show otherwise (Evangelista et al., 2010). Healthcare providers have argued that there is a challenge in managing HF in patients with limited health literacy due to non-adherence to treatment plan and lack of knowledge which subsequently leads to hospital readmissions and emergency visits (Zullig et al., 2014). Health literacy screening in clinical settings can greatly support the patient's needs to improve their health and make informed healthcare decisions. Unfortunately, there is currently no systematic training to improve the provider's management of patients with limited health literacy (Schapira et al., 2017). Addressing health literacy is critical to achieving the objectives set forth in Healthy People 2020 and the key to the success of the national health agenda (Lindenfield et al., 2010). Thus, assessing health literacy in health care practice can greatly support the patient's needs to improve their health and make appropriate health care decisions.

An innovative method for delivering patient education in HF patients with literacy deficits is video-based education (VBE). Utilizing VBE for HF patients may improve knowledge retention and build comprehension skills that are necessary for disease management. Providing VBE as an

option to obtain health information may enhance a patient's confidence and motivation to engage in self-care behaviors, thus preventing poor health outcomes. Strategies that are helpful for HF patients with limited health literacy include frequent use of oral and visual instructions, such as videos, pictographs; limiting instructions to essential information only; making instructions interactive; and including patient and family, friends, and significant others in the discussion (Evangelista et al., 2010). The sophistication of health information technology increases the feasibility of a tailored approach to health education in those with chronic diseases (Schapira et al., 2017). There is currently no gold standard educational intervention for HF patients (Boyde & Peters, 2014). Tailoring educational interventions to an individual's health literacy level may be effective in clinical settings when outcomes of disease knowledge and self-management of chronic disease are of interest (Schapira et al., 2017). Therefore, the purpose of this project was to evaluate the effectiveness of using VBE counseling to improve HF self-management and HF knowledge in adult HF patients. The project also examined the differences between limited and adequate health literacy groups in improving HF self-management behaviors and knowledge after receiving VBE counseling.

Research Questions

In adult HF patients, does the provision of VBE counseling improve HF self-management and knowledge in an outpatient setting?

Is there a significant difference between adequate and limited health literacy groups in improving HF self-management behaviors and knowledge after receiving VBE counseling?

Methods

Introduction

The goal of this project was to integrate health literacy screening and the provision of VBE counseling for HF patients and evaluate changes in HF knowledge and self-management. The examination of significant differences between adequate and limited health literacy group was evaluated after receiving VBE counseling. The project used an individualized approach by identifying the HF patient's highest learning needs for disease management and delivering patient education in a counseling format. This project contributed to the gaps in the literature on the use of a tailored educational intervention according to health literacy level and VBE amongst adult HF patients in outpatient settings.

Research Design

A one-group pretest-posttest design was used to evaluate the effectiveness of VBE counseling on improving self-management and HF knowledge in HF patients.

Research Questions

In adult HF patients, how does the provision of VBE counseling improve HF self-management and knowledge in an outpatient setting?

Is there a significant difference between adequate and limited health literacy groups in developing HF self-management and knowledge after receiving VBE counseling?

Definition of Terms:

Evidence-based practice: The delivery of the highest quality of healthcare by using a problem-solving approach to incorporate the best evidence from well-designed studies and ensuring the best patient outcomes at the lowest costs (Melnyk, Fineout-Overholt, 2015).

Heart Failure: A progressive disease in which the heart's muscle gets injured from conditions such as; high blood pressure or a heart attack and gradually loses its ability to pump enough blood to supply the body's needs (Yancey et al., 2013).

Heart Failure Clinic: A disease management program in which service is provided in an outpatient setting where patients come to receive care from health practitioners with expertise in heart failure (Lindenfield et al., 2010).

Heart Failure Knowledge: The relevant information that one is able to recall from memory and previously learned material pertaining to heart failure (Riegel, Dickson, & Faulkner, 2016).

Health Literacy: The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (Evangelista et al, 2010).

Limited health literacy: Individuals with low or marginal capacity to obtain, process, communicate, and understand basic health information and services to make appropriate health decisions.

Self-care: A natural decision-making process that influences actions that maintain physiologic stability, facilitate the perception of symptoms, and direct the management of those symptoms (Riegel, Dickson, & Faulkner, 2016).

Usual Heart Failure Education: Oral or written education delivered by providers or nurses that consists of a 1-hour discussion of HF education during a patient appointment.

Video-based education: The use of audio-visual recording technology that enables learners to explore and expand their knowledge while at the same time expressing their opinion in the target language (Wang, 2010).

Video-based education counseling: The provision of individualized, 15-30-minute face-to-face VBE counseling sessions and/or telephone consultations according to a patient's health literacy level and highest learning needs for disease self-management. The health care professional delivers patient education by providing assistance and guidance for the patient (via telephone or face-to-face) to achieve focused learning through videos. The healthcare professional recommends specific video topics based on patient highest learning needs such as; medication adherence or sodium restriction and facilitates post-VBE discussions to guide the patient in incorporating strategies to improve self-management skills in daily life. Collaboration with the patient's advanced practice provider or physician and patient follow-up is necessary to identify areas for improvement in lifestyle behaviors and to remain consistent with the active treatment plan.

Setting

This project was conducted at two outpatient heart and vascular clinics located in Central Virginia. Participant recruitment, enrollment, and implementation of the intervention took place

at each HF Clinic to reach the desired population. Each HF clinic offers access to comprehensive cardiac care and disease management to HF patients residing in the 13 localities of central, urban, or rural areas of Virginia. The volume of patients seen by an advanced practice provider at clinic one is approximately 3,000 patients per year (approximately 250 patients per month). The volume of patients seen by an advanced practice provider at clinic two is approximately 2,400 patients per year (approximately 200 patients per month). The patient population comprises of African Americans, Hispanics, Asians, and predominantly Caucasians. Each clinic provides HF management for those who are frequently admitted to the hospital, requires comprehensive HF management, or evaluation of health status post-hospitalization. Other services include assistance with HF lifestyle or behavioral changes such as; monitoring salt and fluid intake; assessing response to medication therapy, treating HF patients with a heart device, or providing home-health heart care to those within a 60-mile radius of the clinic. The project was assisted by two nurse practitioners with expertise in HF who ensured clinical resources, access to necessary data, clinic awareness of the project, and participant recommendations. Collaborating health professionals included nurse practitioners, nurses, and physicians.

Sample

A convenience sample meeting the following criteria for enrollment was recruited for the project: adult patients 18 years or older diagnosed with class I, II, III, or IV HF classified by the New York Heart Association (NYHA) or stage A, B, C, or D HF classified by the American College of Cardiology/American Heart Association, patients receiving care at either of the HF clinics who resides in Virginia, patients with home internet access via personal computer, tablet, or smartphone, and patients with limited or adequate health literacy. Patients were excluded from

the project if diagnosed with cognitive impairment (Dementia, Alzheimer's disease, intellectual disabilities), unable to read or write in English, lack of consistent internet access at home, or legally blind.

Measures

The Short Test of Functional Health Literacy in Adults (S-TOFHLA). The S-TOFHLA is a 7-minute, 36-item measurement tool that was used to measure health literacy (See Appendix D). The instrument is a functional literacy assessment tool designed to evaluate adult literacy, numeracy, and reading comprehension that is necessary to understand and negotiate the health care system adequately (Baker, 2006). The S-TOFHLA has been documented as a practical measure of functional health literacy with good reliability and validity that can be used by health educators to identify individuals who require special assistance to achieve learning goals (Baker et al., 2006). It is commonly used in several research studies involving health literacy in those with chronic diseases such as, diabetes and HF in clinical or educational settings. The test is also printed in 14-point font, large print to accommodate patients with visual acuity at least 20/50. One point is given towards the final score for each correctly marked answer.

For reading comprehension, the instrument tests the patient's ability to read passages using real materials from the health care setting (U.S. General Services Administration, 2006). The 36-item instrument uses a modified Cloze procedure and the reading passages are selected from instructions for preparation for an evaluation study, e.g. X-ray, upper GI series, and the patient rights and responsibilities section of a Medicaid application form (U.S. General Services Administration, 2006). The reading passages also increase in difficulty by the end of the

screening test. Functional health literacy levels are categorized as inadequate functional health literacy, marginal functional health literacy, and adequate functional health literacy.

Patients who have adequate health literacy received a score between 23-36 points, which indicates that the patient can read and interpret most health texts. Patients who have marginal health literacy received a total score between 17-22 points, which indicates that the patient has difficulty reading and interpreting health texts. Patients with inadequate health literacy received a score between 0-16 points, which indicates that the patient is unable to read and interpret health texts. Individuals who score as marginal or inadequate health literacy will not be able to understand directions for their health care. In fact, they are likely to take their medications incorrectly or fail to follow prescribed diets or treatment regimens (Baker et al., 2006). The tool also suggests that when a patient is identified as having low or marginal health literacy, health care providers should make modifications to the treatment or education plan to accommodate these individuals.

The Self-care of Heart Failure Index v.7.2 (SCHFI). The SCHFI version 7.2, is a 39-item measurement tool that was used to measure HF self-care (See Appendix E). The newly revised instrument comprises of four scales measuring self-care maintenance, self-care management, symptom perception, and self-care confidence. The SCHFI is supported for its internal consistency, validity, and test-retest reliability (Riegel et al., 2019). It has also been frequently utilized for many research studies since it was published in 2008. The use of SCHFI has been cited in 911 studies and a variety of them reveals how self-care behaviors can improve outcomes, including quality of life (Riegel et al., 2019). The self-care concepts emphasized in this measurement tool are also congruent with the situation-specific theory of heart failure self-care. The instrument uses Likert-type response questions for each measurement scale divided

into four sections labeled section A through D. The Self-Care Maintenance scale (Section A) includes 10 questions related to treatment adherence and healthy behaviors measured in terms of frequency (1 = never to 5 = always) (Riegel et al., 2019). The Symptom Perception scale (Section B) includes 8 items assessing frequency of behaviors (1 = never to 5 = always) and 2 items on how quickly symptoms were recognized and identified as HF (0 = I did not recognize the symptom to 5 = very quickly) (Riegel et al., 2019). Specifically, symptom perception involves body listening, monitoring signs, as well as recognition, interpretation of meaning (Riegel et al., 2019).

The Self-Care Management scale (Section C) includes eight questions that ask about how likely a patient will respond to symptoms when they occur with response options ranging from 1 (not likely) to 5 (very likely) (Riegel et al., 2019). The Self-Care Confidence scale (Section D) includes 10 questions that assess how confident the patient is in managing their HF and following treatment plans even when difficult with response options ranging from 1 (not confident) to 5 (extremely confident). Although this scale is not considered to be a part of self-care, it is a process that moderates the relationship between self-care and outcomes. The scales are measured scored separately and the response choices are summed up to achieve a possible score of 0 to 100, with higher scores indicating better HF self-management. The SCHFI is highly advocated and supported for its use in clinical practice or research.

The Atlanta Heart Failure Knowledge Test (AHFKT). The AHFKT is a 30-item measurement tool that was used to measure HF knowledge and to identify patient understanding and deficits (See Appendix F). The instrument is a useful tool to assess both patient and family member HF knowledge with demonstrated acceptable psychometric properties (Reilly et al., 2009). The choice items contain of two questions concerning pathophysiology, twelve questions

concerning nutrition, six questions regarding behaviors, four questions regarding symptom management, and six questions regarding medications (Butts et al., 2018). Patients with higher scores out of 30 questions indicate higher HF knowledge. The AHFKT has been utilized in multiple HF studies for its reliability and validity. A recent systematic review of knowledge measures suggested that the AHFKT might be the most appropriate measure for assessing HF knowledge (Butts et al., 2009). HF nursing experts report excellent content validity and readability. Furthermore, the content validity ratings on relevance and clarity ranged from .55 to 1.0 with 81% of the items rated .88-1.0 (Reilly et al., 2009). Construct validity also demonstrated the correlation of knowledge with clinical self-care outcomes including dietary sodium consumption, medication adherence, and health care utilization (Reilly et al., 2009). In research, the AHFKT assessment in a pretest and posttest design can evaluate nursing interventions directed toward improving patient HF knowledge and self-care behaviors in clinical practice and research (Butts et al., 2018).

Demographic and clinical data. The demographic data collected includes age, race, gender, level of education, employment status, marital status, and income (See Appendix K). The clinical data that was collected includes the NYHA HF functional class or ACC/AHA stage of HF, type of HF, ejection fraction percentage, and other medical comorbidities (See Appendix K). The NYHA functional classification is a guideline to classify the extent or severity of HF. The classification is as follows: Class I HF indicates that the patient has no symptoms or functional limitations, e.g. shortness of breath when walking or climbing stairs (AHA, 2019). Class II HF will reveal mild symptoms and slight limitation during ordinary activity such as chest pain or shortness of breath (AHA, 2019). Class III HF will reveal marked functional limitations and less than ordinary activity leads to symptoms, e.g. shortness of breath when walking short distances

and comfortable only at rest (AHA, 2019). Lastly, class IV is the most severe form of HF. There are severe functional limitations and discomfort with any physical activity and symptoms are present even at rest (AHA, 2019).

The two types of HF are systolic HF and diastolic HF. HF with reduced ejection fraction (HFrEF) or systolic HF occurs when the left ventricle of the heart loses its ability to contract normally (AHA, 2017). This causes the heart to pump with inadequate force and push an insufficient amount of blood circulation into the body. In contrast, HF with preserved ejection fraction (HFpEF) or diastolic HF occurs when the left ventricle of the heart loses its ability to relax normally because the muscle has become stiff (AHA, 2017). This causes the heart to fill with blood inadequately during the resting period between each beat (AHA, 2017). The ejection fraction (EF) of the heart is a measurement, expressed as a percentage, of how much blood the left ventricle pumps out with each contraction (AHA, 2017). A normal EF of the heart should be between 50-70% however, a normal EF could be present in HF (AHA, 2017).

Procedures

Pre-intervention and recruitment. The principal investigator formulated a PowerPoint presentation (See Appendix L) of the project to present to staff members at each outpatient HF clinic and established willing project facilitators to gain access to the desired population. The project objectives and project goals were discussed via in-service presentation meetings or mass emails to increase clinic awareness of the project. The principal investigator and practice mentors at each clinic facilitated recruitment by placing recruitment flyers in patient examination rooms, waiting rooms, and conference rooms. The recruitment flyer also included the principal investigator's contact information such as; name, phone number, and email address (See Appendix G). The principal investigator received assistance in recruiting and patient

recommendations from one practice mentor, a DNP advisor, two Registered Nurses, and a Physician. An inclusion and exclusion sheet was used by the principal investigator to maintain project fidelity and to ensure that the target population was reached (See Appendix H). Interested patients were encouraged to contact the principal investigator, at which a further explanation about the project was given. Efforts were made to adhere to ethical considerations for all patients. With guidance from a practice mentor, the principal investigator approached patients with appointments at the clinic two to three days per week for four to six hours per day. Clinic practice mentors and the principal investigator collectively informed patients about the project.

All HF patients meeting eligibility criteria during the recruitment period were enrolled for the project. All eligible patients who enrolled received a recruitment information sheet (See Appendix I) and written informed consent were obtained (See Appendix J). The principal investigator utilized a consulting room or an unoccupied patient examination room to enroll patients and verbally discuss the process and duration of the project. The principal investigator provided participants with contact information if they should have further questions or concerns about the project. Participants were informed that they had the option to opt-out of the project at any time. With patients' consent, demographic and clinical data relevant to the study, email addresses, and contact number was collected. S-TOFHLA scores, baseline SCHFI and AHFKT scores were obtained from each participant. Patient charts at each HF clinic were also accessed and reviewed by the principal investigator to verify reported clinical data that was collected from each participant.

Intervention. The videos for HF are located on the University of Virginia Health System: Online Patient Education Library. The online library provides a collection of video education topics for cardiovascular diseases including HF. It is developed in partnership with the

American Heart Association, the American Stroke Association, and The Wellness Network to empower patients and improve quality of life. Each video is viewable with a transcript in English and Spanish. The video library is easy to navigate and may be viewed on a smartphone, tablet, or personal computer. Each patient had free access to 31 HF videos that are delivered with actual patient scenarios and evidence-based guidelines.

The HF video content is grouped into two sections which are *Heart Failure Basics* and *Heart Failure Lifestyle Changes* (See Appendix M). The *Heart Failure Basics* section comprises of 20 videos ranging from 2-6 minutes per video. The videos address HF overview topics such as; the diagnosis of HF, monitoring symptoms of HF, medications used for HF, managing HF medications, common tests for HF, warning signs of HF, home care management for HF, HF treatment plan, managing HF flare-ups, preparing for patient appointments, building a support network, and emotions of HF. The *HF Lifestyle Changes* section comprises 13 videos ranging from 3-7 minutes per video. This section of videos addresses topics such as; strategies to reduce sodium intake, adhering to a heart-healthy diet, reading nutrition labels, fluid guidelines, interpretation of HF diagnosis, exercising safely, avoiding HF readmissions, and establishing future health goals. All patients were informed or directed to watch the HF interpretation and diagnosis videos first and encouraged to use the HF self-care check sheet also provided online. The videos are suitable to be administered within an outpatient setting or at home because of the easy access, convenience, and duration of videos.

All participants were enrolled for individualized weekly support consisting of health literacy screening, a VBE brochure to gain access to online videos, VBE tracking log for note-taking and marking down completed videos, take notes and mark down videos completely watched, 15-30 minute face-to-face counseling sessions or telephone consultations per patient

request, and post-session or consultation follow-up via telephone. The implementation period for the project and follow-up was six weeks. Participants received an informative HF VBE brochure that provided information about the purpose of VBE and its use in HF education, how to access the online patient education video library, website navigation, and recommended HF videos to watch (See Appendix N). A video tracking log was also provided to supplement the brochure and assist the participants in documenting each video completely watched (See Appendix O).

Each participant was encouraged to watch at least three to five HF videos per week specifically tailored to the patient's highest learning needs (e.g. fluid guidelines, medication adherence, sodium restriction, or weight management) and the principal investigator's recommendations. Participants were encouraged to watch the two videos about HF interpretation and diagnosis first, followed by a provider recommended video. Participants had the opportunity to view the HF videos during an educational session held after patient appointments with a healthcare provider or in the comfort of their own home. Those with low or marginal health literacy were highly encouraged to opt-in for face-to-face education counseling sessions. Participants who opted-in for telephone consultations were advised to watch their recommended videos at home and received a phone consultation by the principal investigator to discuss the video topic further. The principal investigator made weekly arrangements to use clinic consulting rooms or unoccupied patient examination rooms for the individual face-to-face counseling sessions. A personal tablet or a clinic owned tablet was used to gain access to the videos during the individualized VBE sessions at the clinic. The principal investigator contacted the participants to schedule the best day and time to discuss video content and learning needs via counseling session or telephone consultation per week. Providing face-to-face counseling sessions also reduced participant barriers to watching the videos and participating in the project.

Before the VBE counseling sessions, the principal investigator reviewed patient charts and collaborated with the HF provider to discuss the participant's treatment plan and identify HF education topics to address. The principal investigator scheduled the counseling sessions after patient appointments for 15-30 minutes while reviewing three HF videos per patient. Participants received self-management counseling and recommendations on which videos to watch based on their individual learning needs. The VBE sessions also facilitated tailored education counseling by recommending specific HF videos and discussing pertinent HF management tips. Scheduling the individualized VBE sessions after patient appointments was an attempt to make the sessions easily accessible and convenient for the participants. Post-VBE discussions were also held to guide the participants to think about effective strategies they could use to modify or improve their HF self-management based on the video that was reviewed.

Additional recommendations were given to each participant based on the provider's and principal investigator's collaboration. The principal investigator encouraged participants to ask questions before the end of the session and scheduled telephone follow-up appointments per patient. Telephone consultations were delivered to patients who preferred to interact with a healthcare professional by phone due to transportation issues or convenience. Participants were asked which videos and the amount they have watched (VBE regimen of three to five videos per week) on their own before the telephone consultation with the principal investigator. Participants were also allowed to watch the videos during the telephone consultation. The principal investigator facilitated post-VBE discussions and encouraged the participants to ask questions regarding the video content. Assistance with formulating effective strategies to improve HF self-management, video topic recommendations, and the next follow-up was discussed before ending the telephone consultations. To maintain project fidelity and organization of project procedures,

the principal investigator utilized a three-phase intervention guide as the project protocol (See Figure 1).

For the follow-up period, weekly telephone calls were conducted by the principal investigator to identify patient issues with viewing the videos or discussing video content. Follow-up appointments were scheduled based on patient preferences. Participants were also provided with reminders for telephone follow-up via text message or email to maintain regular contact. Each participant was encouraged to provide feedback regarding the project and their perspectives on using VBE for HF. The principal investigator used a journal to take notes of participants reported improvements with self-management or knowledge. The weekly telephone follow-ups were also an attempt to empower patients and encourage participation. Participants were notified that the principal investigator would be available to direct educational sessions after their next scheduled patient appointment or available day and time at the clinic. Participants were also made aware of availability for telephone consultations.

Post-intervention. The post-intervention evaluation period began immediately after the six weeks of the individualized weekly support intervention. The participants were informed to complete the SCHFI and the AHFKT questionnaire and report any issues or difficulties with watching the videos. Participants had the opportunity to complete their post-evaluation in-person at the HF clinic or via telephone. All results of the questionnaires were kept secure and results were in a password-protected database. Participants were able to keep their VBE brochure as a resource to access the HF videos and the entire patient education video library website for future reference. Patients were informed to utilize the patient video education website in addition to the education they receive by their other health care providers.

Protection of Human Subjects

The Doctor of Nursing Practice (DNP) scholarly project was submitted to the University of Virginia's Institutional Review Board (IRB) for approval before implementation. The principal investigator obtained written informed consent from all enrolled participants and informed them of the purpose of the project. Participants were given a project information sheet and a copy of the consent form and encouraged to voice any questions or concerns of the project. Participants were made aware of the data collection process (e.g. what data will be collected, how will the data be collected, and how will the data be used), risks and benefits of the project, potential inconvenience, and the duration of the project. Moreover, participants were informed of their right to withdraw from participating in the project. Patients were informed that withdrawing from the project would not affect the current care they receive at the clinic.

The principal investigator completed the required IRB-HSR course for confidentiality prior to implementation of the project and scholarly project defense. Patient identifiers were de-identified from all collected data and stored in the University of Virginia's data storage system. Any written documents produced by the project are locked in a file cabinet to protect patient information. The data collected are only accessible to the involving members of the project such as; the DNP advisor, the principal investigator, and the statistician. Institutional and IRB policies were followed and any unintended adverse effects were reported to the IRB. In conclusion, the project is of minimal risk to participants due to the utilization of an educational intervention. During implementation, the principal investigator was involved with repeated weekly monitoring of the participants to detect any needed clarifications or concerns. The cumulative analysis and findings are reported. The risk of physical harm and adverse health outcomes were not anticipated with this project.

Data Collection

Project data was collected from November 6, 2019, to December 20, 2019. The primary person responsible for the data collection was the principal investigator.

Data Analysis

The project data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 25. The principal investigator received assistance from the team statistician to facilitate the data analysis process. Descriptive statistics for demographics, health literacy level, and clinical data were analyzed and reported as frequencies, standard deviations, means, medians, interquartile ranges (IQR), and percentages. For data sets having fewer than six participants, the IQR was not calculated. To determine statistical significance, a two-sided p -value of $< .05$ was used. The Wilcoxon Signed Rank Test and the Paired-Samples T-test was used to analyze changes in pre-test and post-test scores of the primary outcome measures: HF knowledge, self-care maintenance, self-care symptom perception, self-care management, and self-care confidence. The Wilcoxon Signed Rank Test was also used to determine if the average differences between the pre-intervention and post-intervention scores were statistically significant within the group due to a small sample size and non-normally distributed data. However, the results of Shapiro-Wilk tests for normality indicated that performing Paired-Samples T-tests for the outcomes of self-care maintenance and self-care confidence was appropriate.

The Mann-Whitney U-test was used to determine the differences in pre-post test scores of the primary outcome measures between adequate and limited health literacy groups. To use the Mann-Whitney U test, categorical variables in health literacy groups were combined (low and marginal) due to small frequencies so that there would be two categories for the variable. The

Mann-Whitney U-test was also used to determine whether there are statistically significant differences in the pre-test and post-test scores of the health literacy groups.

Results

The project was guided by the following research questions: (1) In adult HF patients, how does the provision of VBE counseling improve HF self-management and knowledge in an outpatient setting? (2) Is there a significant difference between adequate and limited health literacy groups in improving HF self-management and knowledge after receiving VBE counseling?

Response Rate

Twenty-five HF patients were approached and assessed for project eligibility from November 6, 2019 to December 20, 2019. Ten patients were excluded from the project for the following reasons: declined to participate (3), cognitive impairment documented in EMR (5), lack of internet connection at home or no means of consistent transportation to the HF clinic per week for VBE sessions to accommodate for this barrier (2). Fifteen participants consented for the study but, five out of the fifteen participants did not complete all pre-implementation measures due to loss of contact/ could not be reached via telephone or email after consenting (2), traveling (2), admitted to a skilled nursing facility (1). Ten participants completed the study. Out of the ten participants, five participants were from HF clinic one and the other five participants were from HF clinic two. From the time of participant consent and completion of the study, there was a 66% (10/15) response rate and a 33% (5/15) attrition rate.

Sample Size and Demographics

For the 10 participants completing the study, the mean age was 55.90 (SD 14.64). The range in age was 37-79 years. Four (40%) participants were female and six (60%) participants were male; nine (90%) were White, and one (10%) was Black. For education level, two (20%)

participants were high school graduates, four (40%) participants completed some college, and four (40%) were college graduates. Most patients were married (80%) and two (20%) were not married. Five (50%) participants were either retired or disabled, three (30%) were unemployed, two (20%) participants were employed. A majority of the participants earned an annual income of \$75,000 (5/50%), two (20%) participants earned an annual income between \$51,000 to \$74,000, and three (30%) participants earned an annual income of \$50,000 or less. A complete list of the participant characteristics is located in the tables section (See Table 1).

For clinical characteristics, a majority of the participants had NYHA Class III HF (70%), while only three (30%) participants had NYHA Class II HF. Eight (80%) participants of the population had systolic HF. Seven (70%) participants had HF with reduced EF with an EF of 40% or less, two (20%) participants had HF with preserved EF with an EF of 41-49%, and one (10%) participant had HF with preserved EF with an EF of 50% or more. For documented comorbidities, ten (100%) participants had a past medical history of hypertension and five (50%) participants were obese. Four (40%) participants had a past medical history of chronic kidney disease and two (20%) participants had a medical history of diabetes. A complete list of the clinical characteristics and comorbidities of the project participants is located in the tables section (See Table 2).

HF Knowledge

Results of the primary outcome measures for the ten participants who completed the study were evaluated (See Table 3). Pre-intervention scores ranged from 22 to 28 out of 30 with a mean score of 26.00 (SD = 1.88). Post-intervention scores of HF knowledge slightly increased with a range of 27 to 29 with a mean score of 28.00 (SD = 0.66). The median score of HF knowledge increased from pre-intervention ($Md = 26.50$) and post-intervention ($Md = 28.00$)

Overall, the Wilcoxon Signed Rank Test revealed a statistically significant difference in pre-post intervention scores for HF knowledge (mean 2.0, SD = 2.10, $p = .011$, $r = 0.805$).

HF Self-Management

To evaluate the difference and statistical significance between pre-test and post-test scores in HF self-management, the Wilcoxon Signed Rank Test was used for self-care symptom perception and self-care management (See Table 3). To evaluate the difference between pre-post test scores in self-care maintenance and self-care confidence, the Paired-samples t-test was used based on the results of the Shapiro-Wilk assumptions for normality (self-care maintenance ($W = .953$, $df = 10$, $p = .700$) and self-care confidence ($W = .883$, $df = 10$, $p = .141$).

Self-Care Maintenance. Total scores of pre-intervention self-care maintenance ranged from 40.00 to 97.50, with a mean of 75.00 (SD = 17.24) and post-intervention scores ranged from 55.00 to 100.00 with a mean score of 86.25 (SD = 17.89). A Paired-samples t-test analysis found a significant difference between pre-intervention and post-intervention scores ($M = 11.25$, $SD = 8.99$, $t(10) = 3.95$, $p = .003$ (two-tailed)). The scores were evaluated with a 95% confidence interval ranging from 4.82 to 17.68.

Self-Care Symptom Perception. Pre-intervention scores in symptom perception ranged from 19.57 to 100.00 and had a mean score of 77.82 (SD = 22.42). There was an increase in post-intervention scores ranging from 67.39 to 100.00 with a mean score of 90.21 (SD = 9.29). The median score on the symptom perception scale increased from pre-intervention ($Md = 82.61$) to post-intervention ($Md = 91.30$). The nonparametric Wilcoxon Signed-Rank Test

revealed a statistically significant difference between pre-post intervention scores of self-care symptom perception ($Md = 13.04$, $M = 12.39$, $SD = 14.67$, $p = .021$, $r = 0.732$).

Self-Care Management. Pre-intervention scores in self-management ranged from 12.12 to 87.88 and had a mean score of 59.69 ($SD = 21.71$). Post-intervention scores increased ranging from 66.67 to 93.94 with a mean score of 78.18 ($SD = 10.28$). Mean scores in differences were 18.48 ($SD = 14.24$) and the median score was 15.15. The median score on the self-care management scale increased from pre-intervention ($Md = 65.15$) to post-intervention ($Md = 77.27$). A Wilcoxon Signed-Rank Test found a significant difference between pre-test and post-test intervention scores in self-care management ($p = .005$, $r = 0.888$).

Self-Care Confidence: Total scores of the pre-intervention self-care confidence scale ranged from 42.50 to 100.00, with a mean of 82.25 ($SD = 17.89$) and post-intervention scores ranging from 75.00 to 100.00 with a mean score of 91.25 ($SD = 9.80$). A Paired-samples t-test analysis found a significant difference between pre-intervention and post-intervention scores of self-care confidence (mean 9.0, $SD = 10.15$, $t(10) = 2.80$, $p = .021$ (two-tailed)). The scores were evaluated with a 95% confidence interval ranging from 1.74 to 16.26.

Differences in Health Literacy Groups

Results of the primary outcome measures between participants with adequate health literacy and limited health literacy were evaluated using the nonparametric Mann Whitney U exact test due to small sample sizes per group and a failed test of normality with a p-value less than .05 (See Table 4). Total health literacy scores ranged from 19 to 35 out of 36 with a mean score of 30.40 ($SD = 7.26$). Seven out of ten participants were classified as having adequate health literacy while the other three participants had limited health literacy.

HF Knowledge

For the seven participants with adequate health literacy, pre-intervention scores ranged from 24 to 28 out of 30 with a mean score of 26.71 (SD = 1.38) and a median score of 27. Post-intervention scores of HF knowledge increased with a range of 27 to 29 with a mean score of 28.00 (SD = 0.57) and a median score of 28. Pre-intervention scores in the limited health literacy group ranged from 22 to 26 with a mean score of 24.33 (SD = 2.08) and a median score of 25. Post-intervention scores increased ranging from 27 to 29 with a mean score of 28.00 (SD = 1.00) and a median of 28. A Mann-Whitney U test revealed no significant difference in HF knowledge scores of the adequate health literacy group ($Md = 1.0$) and the limited health literacy group ($Md = 2.0$). The mean score of the differences between the health literacy groups was 3.7 (SD = 2.88), $U = 3$, $p = .117$, $r = 0.556$.

Self-Care Maintenance

Pre-intervention scores for self-care maintenance in the adequate health literacy group ranged from 40.00 to 97.50 with a mean score of 71.07 (SD = 19.30) and a median score of 75. Post-intervention scores ranged from 55.00 to 100.00 with a mean score of 82.50 (SD = 13.77) and a median score of 85. For the limited health literacy group, the pre-intervention scores in self-care maintenance ranged from 77.50 to 90.00 with a mean score of 84.16 (SD = 6.29) and a median score of 85. Post-intervention scores increased ranging from 90.00 to 100.00 with a mean score of 95.00 (SD = 5.00) and a median score of 95. A Mann-Whitney U test revealed no statistically significant difference in pre-test and post-test HF self-care maintenance for the adequate health literacy group ($Md = 10.00$) and the limited health literacy group ($Md = 10.00$). The mean score of the differences between the health literacy groups was 10.83 (SD = 6.29), $U = 10$, $p = 1.000$, $r = 0.037$.

Self-Care Symptom Perception

Total pre-intervention scores in symptom perception for the adequate health literacy group ranged from 19.57 to 100.00 with a mean score of 73.70 (SD = 26.09) and a median score of 78.26. Post-intervention scores increased ranging from 67.39 to 100.00 with a mean score of 87.88 (SD = 10.10) and a median of 89.13. In the limited health literacy group, pre-intervention scores for symptom perception ranged from 84.78 to 91.30 with a mean score of 87.68 (SD = 3.32) and a median score of 86.96. Post-intervention scores also increased ranging from 91.30 to 100.00 with a mean score of 95.65 (SD = 4.34) and a median of 95.65. Overall, a Mann-Whitney U test revealed no significant difference in HF symptom perception of the adequate health literacy group ($Md = 13.04$) and the limited health literacy group ($Md = 4.35$). The mean score of the differences was 7.97 (SD = 6.27), $U = 8.5$, $p = .667$, $r = 0.145$.

Self-Care Management

Pre-intervention scores in self-care management ranged from 12.12 to 84.85 with a mean score of 54.11 (SD = 22.97) and a median score of 54.56. Post-intervention scores increased ranging from 63.64 to 93.94 with a mean score of 77.05 (SD = 10.48) and a median of 78.79. Pre-intervention self-management scores in the limited health literacy group ranged from 63.64 to 87.88 with a mean score of 72.72 (SD = 13.21) and a median score of 66.67. Post-intervention scores ranged from 72.93 to 93.94 with a mean score of 80.80 (SD = 11.47) and a median of 75.76. A Mann-Whitney U test revealed that there was a statistically significant difference in HF self-management of the adequate health literacy group ($Md = 21.21$) and the limited health literacy group ($Md = 6.06$). The mean score of the differences is 8.08 (SD = 3.49), $U = 1.5$, $p = .033$, $r = .017$.

Self-Care Confidence

Total pre-intervention self-care confidence scores for the adequate health literacy group ranged from 42.50 to 97.50 with a mean score of 76.42 (SD = 18.42) and a median score of 80. Post-intervention scores increased ranging from 75.00 to 100.00 with a mean score of 89.28 (SD = 10.58) and a median score of 95. Pre-intervention self-care confidence scores for the limited health literacy group ranged from 90.00 to 100.00 ($M = 95.83$, $SD = 5.20$) and a median score of 97.50. Post-intervention scores slightly decreased for the minimum score ranging from 87.50 to 100.00 ($M = 95.83$, $SD = 7.22$) and a median score of 100. A Mann-Whitney U test revealed a statistically significant difference in self-care confidence between the adequate health literacy group ($Md = 10.00$) and limited health literacy group ($Md = .00$). The mean score of the differences was .00 (SD = 2.50), $U = .5$, $p = .017$, $r = 0.727$.

Discussion

Interpretation of the Findings

This project evaluated the effectiveness of assessing health literacy and tailoring VBE counseling to improve HF knowledge and self-management in an outpatient setting. The differences between adequate and limited health literacy groups in improving self-management behaviors and HF knowledge after receiving VBE counseling were also examined. The findings support and further illuminate results on the small body of evidence specific to the use of VBE and health literacy screening in the HF population. The key findings of this project indicate that VBE counseling is effective and may be considered an important adjunct to support HF self-management and knowledge. Participants started with a mean of 26 (87%) and achieved a post-intervention mean score of 28 (93%) in HF knowledge. The increase in HF knowledge from pre-test to post-test HF knowledge is similar to the findings of the VBE RCT study by Tsuyuki et al., 2019. This finding also supports the Evangelista et al., 2010 HF nursing consensus statement that emphasizes health literacy assessment and the use of videos for HF patients with literacy deficits.

The significant difference in self-care maintenance suggests that the intervention may be beneficial for enhancing HF self-care behaviors, which should help prevent disease-related complications or illness, and improve well-being. Implementing VBE counseling and telephone consultations also indicated that it can improve HF symptom perception; which showed a statistically significant change from pre-intervention (77.82) to post-intervention (90.21) scores. Furthermore, the ten participants had poor self-care management skills with a baseline average score of 59.69, and post-intervention achieved an average score of 78.18 out of 100. This increase in HF self-care management from pre-test to post-test is similar to prior studies (Albert et al., 2007; Veroff et al., 2012) that utilized VBE in HF patients. The outcomes of this project

suggest that implementing tailored interventions such as VBE counseling can lead to improved disease self-management for HF patients.

These findings also align with the three self-care concepts of the Situation-Specific Theory of HF Self-Care: self-care management, maintenance, and symptom perception. The project findings suggest that the intervention can influence HF patients to develop the behaviors necessary to maintain physiologic stability, facilitate the perception of symptoms, and direct the management of the symptoms related to HF (e.g. shortness of breath, edema). Additionally, participants' self-care confidence scores had a nine-point increase from pre-intervention and post-intervention. This finding suggests that the use of patient education tools such as VBE within a self-management counseling program may empower individuals to take the necessary actions to achieve their healthcare goals.

Participants with adequate health literacy had an increase in HF knowledge with an average pre-intervention score of 89 and an average post-intervention score of 93. The limited health literacy group started with an average score of 81 for pre-intervention scores and 93 for post-intervention in HF knowledge. An encouraging key finding was that the limited health literacy group started with lower scores in knowledge but was able to achieve the same post-intervention score as the adequate health literacy group by the end of the project. Although HF knowledge was not significant between the health literacy groups, the increase in pre-post test scores indicates that there is clinical relevance and the intervention may improve knowledge in HF patients with literacy deficits. Self-care maintenance and self-care symptom perception scores did not reveal statistical significance in the results but the increase between pre-post scores may have clinical relevance. Self-care management and self-care confidence showed that there was statistical significance between adequate and limited health literacy groups. This result

indicates that each health literacy group benefitted from the intervention which resulted in increased HF self-management and confidence. The outcomes of the project suggest that the intervention is literacy-sensitive and may be appropriate for adult HF patients when knowledge and self-care behaviors need to be addressed. However, there were surprising findings amongst all the HF self-care scores between adequate and limited health literacy groups.

One factor behind this is the small sample sizes within each group. If more time were allotted for the scope of the project, the assumption is that the project may have captured a larger HF population with limited health literacy and revealed anticipated results among all outcome measures. Another plausible reason that could have influenced the results is that there may have been more newly diagnosed HF patients in the adequate health literacy group. The three individuals with limited health literacy may have had longstanding HF, thus potentially possessing more awareness of HF self-care behaviors and skills. Some of the participants in the adequate health literacy group had a diagnosis of HF that was six months or less prior to the beginning of the project. The results in the adequate health literacy group also suggest that the intervention may benefit HF patients with early diagnosis to adopt healthy lifestyle behaviors. Other co-existing illnesses such as depression may have contributed to the lower scores in self-care measures in the adequate health literacy group. Fifty-percent of the population completing this project had depression documented in their electronic medical record and forty-percent of them were from the adequate health literacy group. Depression can affect chronic disease care by altering brain function, amplifying somatic symptoms, and diminishing self-efficacy and the will to function (Kravitz and Ford, 2008). Since the intervention was given in a counseling format, it may provide additional support and the motivation needed to engage in self-care behaviors for HF patients with depression.

The principal investigator also noticed that participants in the limited health literacy group required more time during educational sessions or telephone consultations. For instance, the individuals within the limited health literacy group required up to twenty to thirty-minute discussions versus the fifteen to twenty-minute discussions for the adequate health literacy group. This finding suggests that HF patients with literacy deficits may require more time and education reinforcement to effectively make behavioral changes. Health literacy screening in outpatient settings may help practitioners to identify patient barriers to retaining pertinent health information and optimize patient education. Surprisingly, self-care confidence scores within this group had a ceiling effect which remained high at 95.83 for pre-intervention and post-intervention. Although self-care confidence is not a part of HF self-care, it measures how empowered a patient may feel to continue to manage their health or make new changes. This may reflect that these individuals already had the confidence to make changes to their health but, were unaware of how they could continue to improve their HF knowledge and self-care behaviors. The participants were also informed of their literacy status; therefore, this information may have motivated them to diligently participate in the project instead of becoming discouraged about learning new information. However, inferences of this result are limited due to the small sample size within the groups.

Overall, the outcomes of this project offer further insight into a tailored intervention that may assist HF patients with literacy deficits. It has been proven in the literature that HF patients with literacy deficits are at risk for developing poor health outcomes and increased morbidity or mortality. Implementing education counseling programs may serve as a tertiary preventative measure to reduce HF complications, readmissions, and mortality. Furthermore, initiating the project intervention may lessen the impact of chronic disease on patient function, longevity, and

quality of life. The results of this project indicate that it is important that healthcare professionals see their role in assessing health literacy to identify HF patients with barriers to adapting self-management skills and support this population by using a novel educational tool such as videos. Integrating health literacy-sensitive, educational self-management programs in outpatient settings may facilitate lifestyle and behavioral changes for HF patients with adequate or limited health literacy.

Strengths and Limitations

The selected pretest-posttest design presents with project limitations. The pretest-posttest research design limits the ability to gain statistical significance from the findings of the project due to the lack of a control group. This research design also limits external validity, meaning that it may be difficult to generalize the results or make predictions about the entire population. Convenience sampling of willing participants increased the risk of selection bias. There is selection bias present within the project due to the nature of how participants were approached and recommended to participate in the project. The six-week time frame to implement is another project limitation. Comparable studies assessed changes in HF self-management, HF knowledge, or self-efficacy within 6 months to 2 years (Albert et al., 2007; Veroff et al., 2012; Tsuyuki et al., 2019). Although the scope of the project did not allow for a longer time period, it serves as a framework for replication and future implementation of research or quality improvement projects regarding health literacy assessment and VBE counseling in HF patients. Additionally, the sample size is a limitation of the project which limits generalizability to the entire population. The small sample size of the project also reduces the power of the study and affects reliability.

Although not a project limitation, there were a few barriers to project implementation. It was anticipated that participants would have the option to watch the videos during patient

appointments. The principal investigator had to adapt to the clinic workflow and realized that this option was no longer feasible due to conflicts in provider or nurse time and hours of operation of the HF clinic. Consequently, the option for patients to watch videos during patient appointments was no longer permitted and VBE sessions were implemented after patient appointments only.

Several strengths increase the reliability and validity of the project. The project utilizes evidence-based practice according to HF guidelines and recommendations. The project also promotes interprofessional collaboration amongst providers and nurses while the aim is to improve patient education delivery and health outcomes. The principal investigator collaborated with each participant's HF provider and sat in during patient appointments to gain more knowledge of what self-care or knowledge topics should be targeted for the patient. Another strength of the project is that it was implemented within an outpatient setting since, the majority of studies found in the literature utilized VBE in inpatient hospital settings. Utilizing VBE within the HF population has been understudied; therefore, the project greatly contributes to research and clinical practice. Furthermore, the project also aims to tailor education based on health literacy level and patient learning needs; which is also understudied within the literature. Therefore, the implementation of this project consistently emphasizes the use of evidence-based research and applies it to nursing practice. High participation rates were achieved through regular contact via telephone, text, or email with project participants. Regular contact with the project participants increased their will to stay engaged, which prevented participant attrition. Lastly, the project uses three validated measurement tools and a theoretical framework that encapsulates the outcomes of the project.

Nursing Implications

Tailoring patient education according to health literacy level can be a pivotal step to bridging the gap between evidence and practice. HF practice guidelines emphasize the role of health literacy as an important factor to address in improving patient self-management. Nurses are in a position to improve communication and educational delivery within HF patients. Health literacy screening may offer an essential point of intervention within rural and underserved populations with limited health literacy. Informing health professionals about the significance of health literacy can increase recognition of factors that may compromise HF self-care management. Healthcare organizations and institutions should consider integrating health literacy as a quality assessment in electronic medical records during initial patient visits. By addressing health literacy in HF, nurses and other collaborative professionals such as; HF nurses, and HF navigators can empower their patients with low or marginal health literacy and increase their decision-making and self-management abilities.

The provision of VBE counseling in outpatient settings is an effective strategy to improve health outcomes in HF patients. Using video-based education in clinical settings can expand efforts to provide valuable patient education according to evidence-based practice (Dahodwala et al., 2018). Nurses who specialize in HF or HF navigators are essential healthcare professionals who can implement and guide HF patients to adapt self-care behaviors within educational or counseling programs. In addition, implementing VBE counseling in HF patients can serve as a useful educational service that is convenient, easy to understand, and improve self-care and HF knowledge. Current evidence reveals that HF patients with limited health literacy require visual educational modalities to fully address learning needs rather than written or oral education only. VBE serves as a cost-effective approach that can decrease patient morbidity and mortality.

Future research is warranted to examine the effects of education counseling programs on decreasing HF-related hospitalizations and improving quality of life in HF patients. A research design with a control and experimental group would best determine the differences in improving HF self-management and knowledge between a VBE counseling program and usual HF education in an outpatient setting. A larger and more diverse HF population would best determine the effects of VBE counseling on improving outcomes in HF patients. A longer study period may also best determine how this population improves self-management behaviors over time. The project would benefit from replication to capture more HF patients with limited health literacy to determine if education counseling programs are a promising solution to address HF patients with literacy deficits. Understanding their experiences is essential if we are to provide optimal care and services that address the full spectrum of the adult HF population.

The Role of the DNP Nurse

The role of the Doctor of Nursing Practice provider takes several important standpoints in implementing evidence-based practice projects, quality improvement, and research. DNP-prepared nurses are at the forefront of healthcare to improve the quality and delivery of patient education by directing counseling programs that facilitate disease self-management. The DNP-prepared nurse is in an excellent position to influence nursing practice, technology implementation, and the integration of practice and technology (Hickey & Brosnan, 2017). Furthermore, the DNP-prepared nurse integrates scholarship and the eight essential components in their practice that are needed to make healthcare practice changes on a local, organizational, or policy level.

DNP-prepared nurses are in the position to foster a multidisciplinary approach to patient education that focuses on health literacy in clinical settings. DNP-prepared nurses are capable of

empowering patients to become more knowledgeable and involved in health maintenance, disease prevention, and chronic disease management (Hickey & Brosnan, 2017). VBE in educational practices serves as an essential method to improve HF knowledge and self-care in HF patients with literacy deficits. These interventions for patient care can increase interprofessional collaboration and enhance the provision of evidence-based practice. The DNP-prepared nurse is a powerful advocate for improving clinical practice and patient resources within a community setting.

Conclusion

Heart failure is a growing health problem that requires a multifaceted and coordinated interprofessional approach to disease management. HF patients may face complications due to limited health literacy or lack of educational resources. The solution must go beyond patient education that is delivered only during health visits. The results of this project indicate that implementing a VBE counseling intervention that tailors patient education according to an individual's health literacy level and learning needs may improve outcomes for HF patients. The project contributes to the gaps in the literature on the use of a novel educational tool for HF self-management and knowledge. If established in outpatient and primary care settings, the intervention can become an option for patients to receive additional support and education to improve disease self-management. A VBE counseling program may serve as an education referral for providers when those with limited health literacy are identified. It introduces an innovative and evidence-based approach to patient education delivery in clinical settings. A healthcare organization that acknowledges health literacy and patient-centered care ensures that every patient receives the greatest benefit of healthcare services and information. Healthcare providers are in a position to improve the quality of life and overall health of HF patients. Using a highly effective educational method that is proven to improve health outcomes is a pivotal step towards practice change.

Products of the DNP Capstone Project

A comprehensive report of the DNP scholarly project will be submitted to the University of Virginia, School of Nursing upon completion of the Doctor of Nursing Practice program. The project findings will be disseminated to the two HF clinics, involving members of the project, and leadership members at each facility. Following the completion of this project, the product is that the project will increase provider awareness of the impact of health literacy on HF patients. Also, it may be implemented as a standard of care within HF clinics and other affiliated healthcare facilities. The VBE brochure created by the principal investigator remained at the two clinics for continuing patient access to the educational HF videos and future replication. A manuscript suitable for publication will be submitted to *The Journal of Cardiac Failure*. Author guidelines for publication to *The Journal of Cardiac Failure* are included in Appendix Q.

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Table 1

Participant Characteristics

Variables	Enrolled Subjects (<i>N</i> = 10)
Age, mean (SD), years	55.90 (14.64)
Gender, n (%)	
Female	4 (40.0)
Male	6 (60.0)
Race, n (%)	
African American	1 (10.0)
White	9 (90.0)
Education level, n (%)	
High school graduate	2 (20.0)
Completed some college	4 (40.0)
College Graduate	4 (40.0)
Employment status, n (%)	
Unemployed	3 (30.0)
Employed	2 (20.0)
Retired	4 (40.0)
Disabled	1 (10.0)
Relationship status, n (%)	
Not Married	2 (20.0)
Married	8 (80.0)
Annual Income, n (%)	
\$50,000 or less	3 (30.0)
\$51,000 - \$74,000	2 (20.0)
\$75,000 or more	5 (50.0)

Table 2

Clinical Characteristics

Variable	Enrolled Subjects (<i>N</i> = 10)
Health Literacy Level, <i>M</i> (<i>SD</i>)	30.40 (7.26)
NYHA HF Class, n (%)	
Class II	3 (30.0)
Class III	7 (70.0)
Type of Heart Failure, n (%)	
Systolic	8 (80.0)
Diastolic	2 (20.0)
Ejection Fraction, n (%)	
HF _r EF (EF ≤ 40%)	7 (70.0)
HF _p EF, borderline (EF 41-49%)	2 (20.0)
HF _p EF (EF ≥ 50%)	1 (10.0)
Comorbidities, n (%)	
Hypertension	10 (100.0)
Diabetes	2 (20.0)
Obesity	5 (50.0)
Depression	5 (50.0)
Hyperlipidemia	4 (40.0)
Chronic kidney disease	4 (40.0)
Coronary artery disease	4 (40.0)
Chronic lung disease	1 (10.0)
Cancer	2 (20.0)
Arthritis	4 (40.0)
Migraines	1 (10.0)

Table 3

Results of Primary Outcome Measures (N = 10)

Variables	Pre-test Mean (SD)	Post-test Mean (SD)	Differences Mean (SD)	<i>p</i> -value
Heart Failure Knowledge	26.0 (1.9)	28.0 (0.7)	2.0 (2.1)	.011*
Self-care maintenance	75.0 (17.2)	86.3 (17.9)	11.3 (9.0)	.003*
Self-care symptom perception	77.8 (22.4)	90.2 (9.3)	12.4 (14.7)	.021*
Self-care management	59.7 (21.7)	78.2 (10.3)	18.5 (14.2)	.005*
Self-care confidence	82.3 (17.9)	91.3 (9.8)	9.0 (10.2)	.015*

*¹**p < .05** Wilcoxon Signed Rank Test² Paired-Samples T-Test

Table 4

Results of Primary Outcome Measures between the Health Literacy Groups

Variables	Adequate Health Literacy (<i>N</i> = 7)		Limited Health Literacy (<i>N</i> = 3)		<i>p</i> -value
	Pre-Post Differences		Pre-Post Differences		
	<i>M</i> (<i>SD</i>)	<i>Mdn</i> (<i>IQR</i>)	<i>M</i> (<i>SD</i>)	<i>Mdn</i> (<i>RNG</i>)	
Heart Failure Knowledge	1.3 (1.4)	1.0 (0.0 - 2.0)	3.7 (2.9)	2.0 (2.0 - 7.0)	.117
Self-care maintenance	11.4 (10.4)	10.0 (2.5 - 15.0)	10.8 (6.3)	10.0 (5.0 - 17.5)	1.000
Self-care symptom perception	14.3 (17.2)	13.0 (0.0 - 17.4)	8.0 (6.3)	4.3 (4.3 - 15.2)	.667
Self-care management	22.9 (14.9)	21.2 (12.1 - 24.2)	8.1 (3.5)	6.1 (6.1 - 12.1)	.033*
Self-care confidence	12.9 (9.7)	10.0 (7.5 - 15.0)	0.0 (2.5)	0.0 (-2.5 - 2.5)	.017*

Note. IQR = Interquartile Range, where the *N* = 7, the Interquartile range is given as the 25th percentile – 75th percentile. RANGE = Range, where the *N* = 3, the Range is given as the minimum and maximum values.

**p* < .05 Mann-Whitney U Exact test

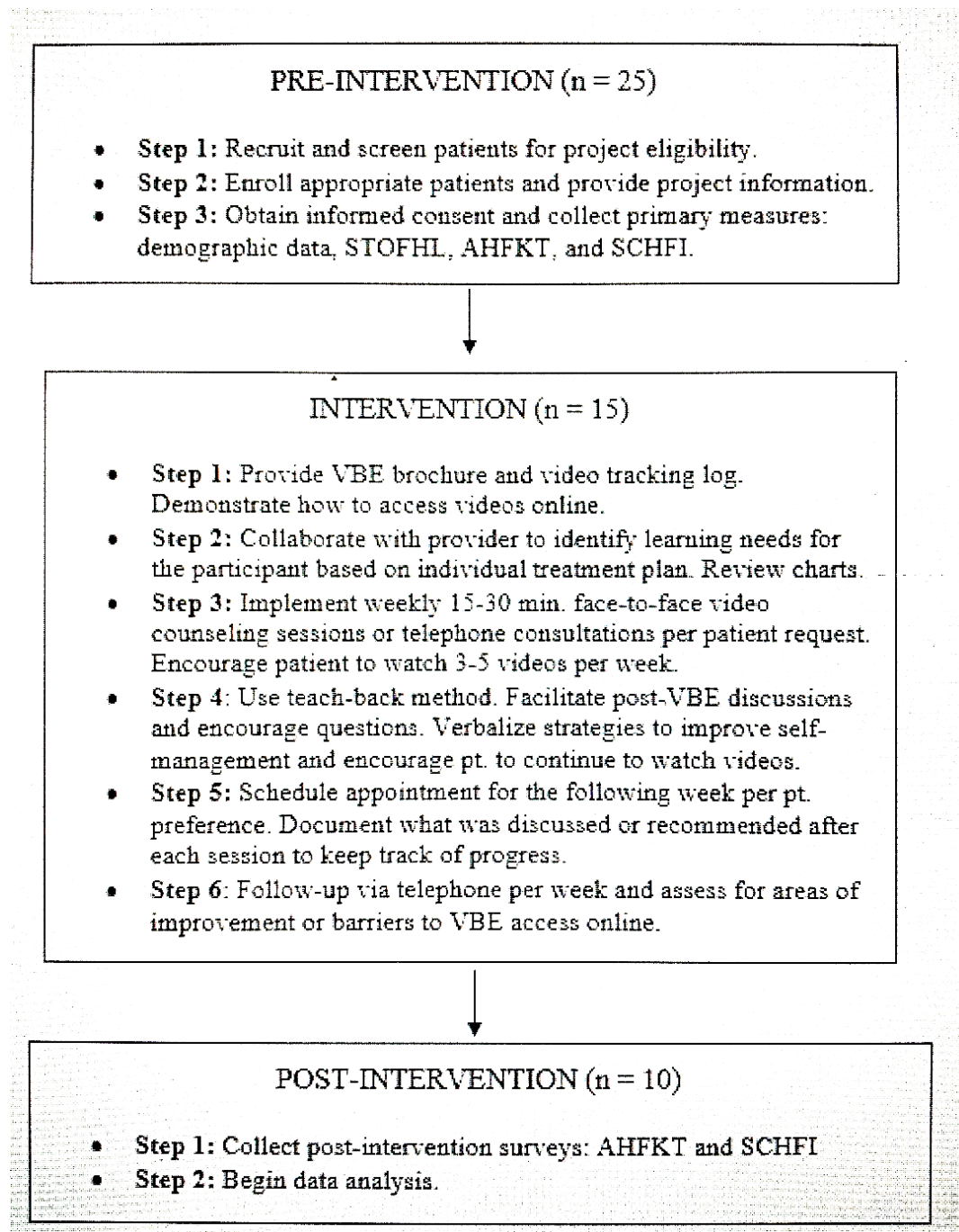


Figure 1. Project Protocol: Step-by-Step Intervention Process.

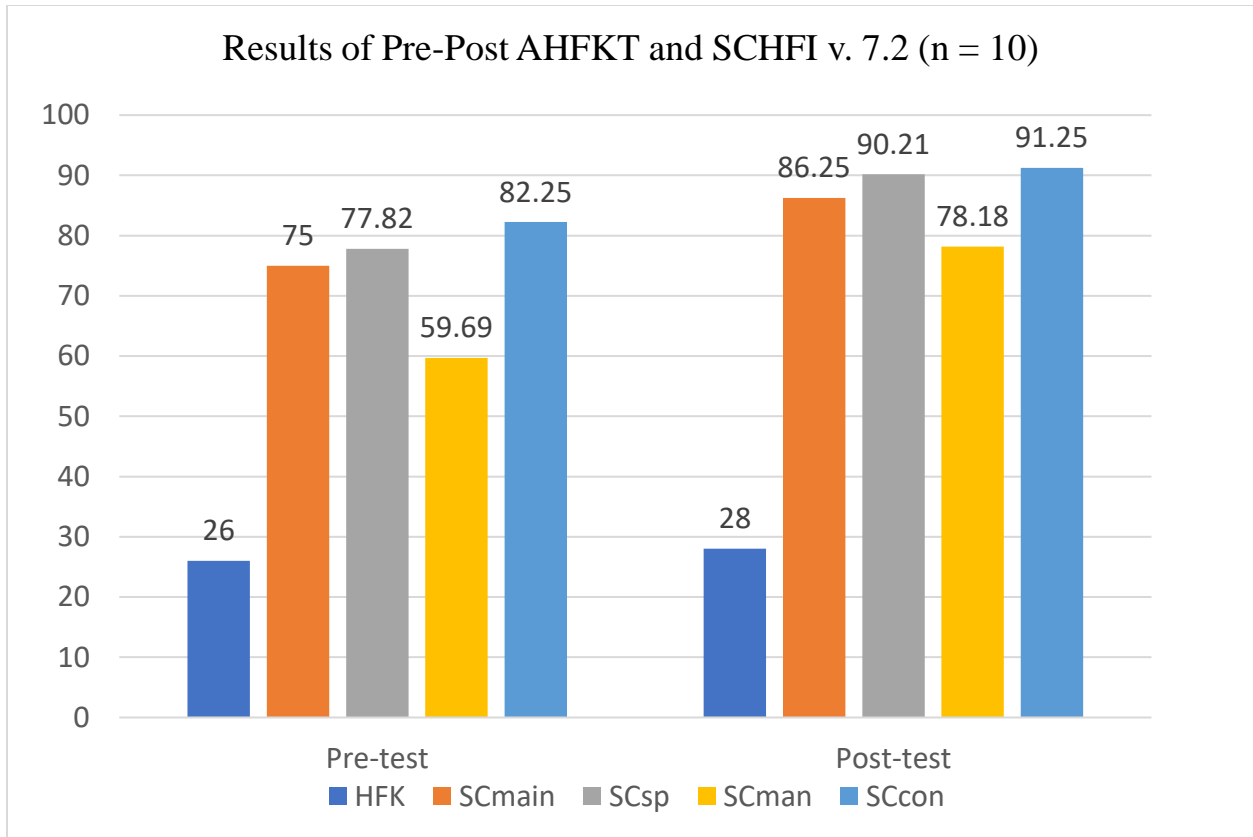


Figure 2. Results of Primary Outcome Measures

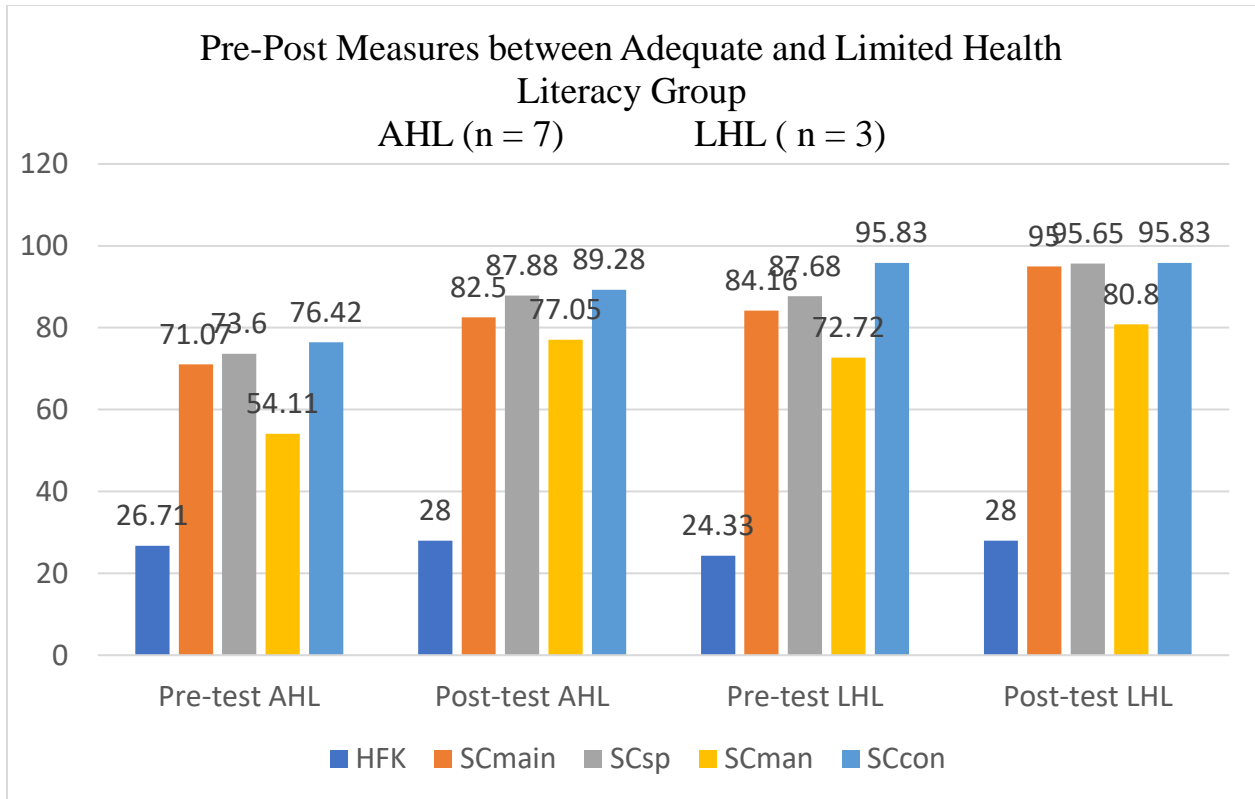



Figure 3. Results of Outcome Measures between Health Literacy Groups

Appendix A. IRB Exemption Form: Augusta Health Heart and Vascular Center



Augusta Health
PO. Box 1000
Fishersville, VA 22939

Phone (540) 333-1000 **Stamron**
Phone (540) 932-1000 **Stamron**
Toll Free 1-800-952-1207
www.augustahhealth.com

Notice of IRB EXEMPTION

Principal Investigator: Paula Atueyi
Tami Collins, NP

Protocol Title: Utilizing Video-Based Education to Address Health Literacy in Heart Failure Patients

IRB #: 00002496

IRB Study #: 19-03

Type of Review: Initial - EXEMPT


Date of Approval: NA

The Institutional Review Board Chairman of Augusta Health has reviewed your study submission and has determined that it is **EXEMPT** from IRB submission, review and approval.

Exemption from IRB Committee review is based on the fact that there are no patient identifiers and no risk to patients. This is strictly a Quality Improvement study which uses existing knowledge to improve health care outcomes within a local health care institution or setting.

When an activity involving data is intended to evaluate an existing practice and attempt to improve it based upon existing knowledge, the Augusta Health IRB would not classify this activity as research and the activity would not be subject to the Department of Health and Human Services (DHHS) human research regulations.

The Augusta Health Institutional Review Board, #WA 00003292, is duly constituted, fulfilling all requirements for diversity, and has written procedures for initial and continuing review of human subjects research protocols. The AH IRB complies with all US regulatory requirements related to the protection of human research participants, specifically 45CFR46, 21CFR50, 21CFR56, 21CFR312, 21CFR812, 45CFR164.508-14. In addition, the AH IRB complies with the guidelines of the Office of Human Subjects Protection of the OHHS.



William Cohee, Pharm.D.
Authorized Signature

3 Oct 2019

IRB Signature Date

February 2014

Appendix B. Permission Letter: University of Virginia Heart and Vascular Center

Marian Lawson, RN
Manager of Heart Failure Program
UVA Health
Charlottesville, VA 22908

October 17, 2019

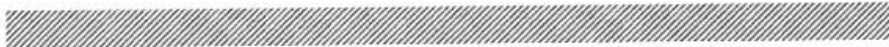
Paula Atueyi
c/o The University of Virginia School of Nursing
225 Jeanette Lancaster Way
Charlottesville, VA 22903

Dear Ms. Atueyi,
After discussion in the Heart Failure Quality Support Team and with Heart & Vascular Center leadership, we are pleased to notify you that you have been granted permission to conduct your Doctor of Nursing Practice project focusing on use of video education in the outpatient setting in our Heart Failure NP clinics. Our teams look forward to working with you and are excited to see how this intervention may benefit our patients.

Respectfully,

A handwritten signature in black ink, appearing to read "Marian Lawson".

Marian Lawson, RN
Manager of Heart Failure Program
UVA Health



Appendix C. CITI Training Certification



Completion Date 06-Feb-2019
Expiration Date 05-Feb-2022
Record ID 25874668

This is to certify that:

Paula Atueyi

Has completed the following CITI Program course:

Human Research (Curriculum Group)
IRB for Health Sciences Research (IRB-HSR): ALL RESEARCH (Course Learner Group)
1 - Basic Course (Stage)

Under requirements set by:

University of Virginia



Verify at www.citiprogram.org/verify/?wcb092c98-fd77-4ada-86aa-a3b9b4f0d622-25874668

Appendix D. Short Test of Functional Health Literacy in Adults

Short Test of Functional Literacy in Adults
STOFHLA
READING COMPREHENSION

HAND PATIENT THE READING COMPREHENSION PASSAGES TO BE COMPLETED. FOLD BACK THE PAGE OPPOSITE THE TEXT SO THAT THE PATIENT SEES ONLY THE TEXT.

PREFACE THE READING COMPREHENSION EXERCISE WITH:

“Here are some other medical instructions that you or anybody might see around the hospital. These instructions are in sentences that have some of the words missing. Where a word is missing, a blank line is drawn, and 4 possible words that could go in the blank appear just below it. I want you to figure out which of those 4 words should go in the blank, which word makes the sentence make sense. When you think you know which one it is, circle the letter in front of that word, and go on to the next one. When you finish the page, turn the page and keep going until you finish all the pages.”

STOP AT THE END OF 7 MINUTES

PASSAGE A: X-RAY PREPARATION

PASSAGE B: MEDICAID RIGHTS AND RESPONSIBILITIES

PASSAGE A

A1	(1)	(0)
a.		
b.		
c.		
d.		

A2	(1)	(0)	A3	(1)	(0)
a.			a.		
b.			b.		
c.			c.		
d.			d.		

A4	(1)	(0)	A5	(1)	(0)
a.			a.		
b.			b.		
c.			c.		
d.			d.		

Sub-Total

PASSAGE A

Your doctor has sent you to have a _____ X-ray.

- a. stomach
- b. diabetes
- c. stitches
- d. germs

You must have an _____ stomach when you come for _____.

- | | |
|-----------|--------|
| a. asthma | a. is. |
| b. empty | b. am. |
| c. incest | c. if. |
| d. anemia | d. it. |

The X-ray will _____ from 1 to 3 _____ to do.

- | | |
|---------|-----------|
| a. take | a. beds |
| b. view | b. brains |
| c. talk | c. hours |
| d. look | d. diets |

A6 (1) (0)	A7 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

A8 (1) (0)	A9 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

A10 (1) (0)	A11 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

Sub-Total

THE DAY BEFORE THE X-RAY.

For supper have only a _____ snack of fruit, _____ and jelly,

- | | |
|-----------|-----------|
| a. little | a. toes |
| b. broth | b. throat |
| c. attack | c. toast |
| d. nausea | d. thigh |

with coffee or tea.

After _____, you must not _____ or drink

- | | |
|--------------|----------|
| a. minute, | a. easy |
| b. midnight, | b. ate |
| c. during, | c. drank |
| d. before, | d. eat |

anything at _____ until after you have _____ the X-ray.

- | | |
|---------|--------|
| a. ill | a. are |
| b. all | b. has |
| c. each | c. had |
| d. any | d. was |

A12	(1)	(0)
a.		
b.		
c.		
d.		

A13	(1)	(0)	A14	(1)	(0)
a.			a.		
b.			b.		
c.			c.		
d.			d.		

A15	(1)	(0)	A16	(1)	(0)
a.			a.		
b.			b.		
c.			c.		
d.			d.		

Sub-Total

THE DAY OF THE X-RAY.

Do not eat _____.

- a. appointment.
- b. walk-in.
- c. breakfast.
- d. clinic.

Do not _____, even _____.

- | | |
|-----------|------------|
| a. drive, | a. heart. |
| b. drink, | b. breath. |
| c. dress, | c. water. |
| d. dose, | d. cancer. |

If you have any _____, call the X-ray _____ at 616-4500.

- | | |
|---------------|---------------|
| a. answers, | a. Department |
| b. exercises, | b. Sprain |
| c. tracts, | c. Pharmacy |
| d. questions, | d. Toothache |

B17 (1) (0)
a.
b.
c.
d.

B18 (1) (0)	B19 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

B20 (1) (0)
a.
b.
c.
d.

B21 (1) (0)	B22 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

B23 (1) (0)
a.
b.
c.
d.

Sub-Total

PASSAGE B

I agree to give correct information to _____ if I can receive Medicaid.

- a. hair
- b. salt
- c. see
- d. ache

I _____ to provide the county information to _____ any

- | | |
|----------|--------------|
| a. agree | a. hide |
| b. probe | b. risk |
| c. send | c. discharge |
| d. gain | d. prove |

statements given in this _____ and hereby give permission to

- a. emphysema
- b. application
- c. gallbladder
- d. relationship

the _____ to get such proof. I _____ that for

- | | |
|-----------------|----------------|
| a. inflammation | a. investigate |
| b. religion | b. entertain |
| c. iron | c. understand |
| d. county | d. establish |

Medicaid I must report any _____ in my circumstances

- a. changes
- b. hormones
- c. antacids
- d. charges

B24 (1) (0)	B25 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

B26 (1) (0)	B27 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

B28 (1) (0)	B29 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

B30 (1) (0)
a.
b.
c.
d.

B31 (1) (0)	B32 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

Sub-Total

within _____ (10) days of becoming _____ of the change.

- | | |
|----------|----------|
| a. three | a. award |
| b. one | b. aware |
| c. five | c. away |
| d. ten | d. await |

I understand _____ if I DO NOT like the _____ made on my

- | | |
|---------|---------------|
| a. thus | a. marital |
| b. this | b. occupation |
| c. that | c. adult |
| d. than | d. decision |

case, I have the _____ to a fair hearing. I can _____ a

- | | |
|-----------|------------|
| a. bright | a. request |
| b. left | b. refuse |
| c. wrong | c. fail |
| d. right | d. mend |

hearing by writing or _____ the county where I applied.

- a. counting
- b. reading
- c. calling
- d. smelling

If you _____ TANF for any family _____, you will have to

- | | |
|----------|--------------|
| a. wash | a. member, |
| b. want | b. history, |
| c. cover | c. weight, |
| d. tape | d. seatbelt, |

B33 (1) (0)	B34 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

B35 (1) (0)	B36 (1) (0)
a.	a.
b.	b.
c.	c.
d.	d.

READING COMPREHENSION
RAW SCORE

Sub-Total

_____ a different application form. _____, we will use

- | | |
|-----------|-------------|
| a. relax | a. Since, |
| b. break | b. Whether, |
| c. inhale | c. However, |
| d. sign | d. Because, |

the _____ on this form to determine your _____.

- | | |
|-----------|-------------------|
| a. lung | a. hypoglycemia. |
| b. date | b. eligibility. |
| c. meal | c. osteoporosis. |
| d. pelvic | d. schizophrenia. |

Short Test of Functional Health Literacy in Adults (STOFHLA)

Joanne R. Nurss, Ph.D., Ruth M. Parker, M.D., Mark V. Williams, M.D., & David W. Baker, M.D., M.P.H.

TOFHLA is a measure of the patient's ability to read and understand health care information, their functional health literacy. TOFHLA Numeracy assesses their understanding of prescription labels, appointment slips, and glucose monitoring. TOFHLA Reading Comprehension assesses their understanding of health care texts such as preparation for a diagnostic procedure and Medicare Rights & Responsibilities.

Date ____/____/____

Name _____ M ____ F

Birthdate ____/____/____ Age ____ SSN or ID# _____

Hospital or Health-care Setting _____

City, State _____

Short Form Administered: ____English ____Spanish

STOFHLA - Score

TOFHLA Total Score:
Reading Comprehension Raw Score (0-36)

Functional Health Literacy Level:

0 - 16 -- Inadequate Functional Health Literacy

17 - 22 -- Marginal Functional Health Literacy

23 - 36 -- Adequate Functional Health Literacy

July 1995
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STOFHLA: Reading Comprehension
Scoring Key

14 Point Font

Passage A	Passage A	Passage A	Passage B	Passage B	Passage B
A1 a	A6 a	A12 c	B17 c	B24 d	B33 d
A2 b	A7 c	A13 b	B18 a	B25 b	B34 c
A3 d	A8 b	A14 c	B19 d	B26 c	B35 b
A4 a	A9 d	A15 d	B20 b	B27 d	B36 b
A5 c	A10 b	A16 a	B21 d	B28 d	
	A11 c		B22 c	B29 a	
			B23 a	B30 c	
				B31 b	
				B32 a	

Appendix E. Self-Care of Heart Failure Index

All answers are confidential.

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

SECTION A:

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

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

SECTION B:

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

48. Ask a family member or friend for advice?	1	2	3	4	5
49. Try to figure out why you have symptoms?	1	2	3	4	5
50. Limit your activity until you feel better?	1	2	3	4	5

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

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

SECTION D:

In general, how confident are you that you can:

(Circle **one** number for each statement)

	Not Confident		Somewhat Confident		Extreme Confident
Keep yourself <u>stable and free of symptoms</u> ?	1	2	3	4	5
Follow the <u>treatment plan</u> you have been given?	1	2	3	4	5
52. <u>Persist</u> in following the treatment plan even when difficult?	1	2	3	4	5
53. <u>Monitor your condition</u> routinely?	1	2	3	4	5
54. <u>Persist</u> in routinely monitoring your condition even when difficult?	1	2	3	4	5
55. <u>Recognize changes</u> in your health if they occur?	1	2	3	4	5
56. <u>Evaluate the importance</u> of your symptoms?	1	2	3	4	5
57. <u>Do something</u> to relieve your symptoms?	1	2	3	4	5

58. <u>Persist</u> in finding a remedy for your symptoms even when difficult?	1	2	3	4	5
59. <u>Evaluate</u> how well a remedy works?	1	2	3	4	5

Appendix F. Atlanta Heart Failure Knowledge Test

(Correct answers are marked with an asterisk)

We have some questions about heart failure. Select one response for each question. Don't worry if you are not sure of the answers; just do the best you can.

1. Heart failure is a problem in which: (Patho)

- a. There is too much blood in the body
- b. The heart is unable to pump enough blood *
- c. The blood vessels in the heart are clogged
- d. The heart skips beats

2. Which of the following statements about heart failure is TRUE? (Patho)

- a. It can be cured with drugs and other treatments.
- b. A person with heart failure cannot live a normal life.
- c. Heart failure cannot be cured but it can be controlled. *
- d. Heart failure means the heart has stopped beating.

People with heart failure can do many things to help themselves. Think about each of these activities and decide if they would be helpful for someone with heart failure.

	Yes	No
3. Weigh themselves everyday (behavior)	*	
4. Drink lots of fluids (nutrition)		*
5. Stop smoking (behavior)	*	
6. Drink alcoholic drinks each day to relax (behavior)		*
7. Skip heart failure medicines when they feel better (Medication)		*
8. Call their doctor to report loss of 2 pounds in 1 night (symptoms)		*

9. ACE inhibitors (ex. Capoten, Vasotec, Lisinopril, or Zestril) are medicines used to treat heart failure. These drugs help the heart pump stronger by: (medication)

- a. Slowing down the heart rate
- b. Causing blood vessels to get smaller
- c. Relaxing tight blood vessels and blocking salt retention*
- d. Improving blood counts (reducing anemia)

10. People who have heart failure take diuretics (Lasix, "water pills") so that: (medication)

- a. Their kidneys will make more urine and pass more water*
- b. Their heart will beat more steady
- c. The blood vessels in their body will widen or relax
- d. Their heart will pump stronger

11. People with heart failure who are taking a diuretic ("water pill") need to: (medication)

- a. Know if they need to take extra potassium with their water pill*
- b. Take the diuretic after 3-4 pm in the day
- c. Not worry about signs and symptoms of dehydration
- d. Drink lots of water to replace lost fluid

12. If a person with heart failure gains 2-3 pounds in a few days, this usually means he/she: (symptoms)

- a. Is eating too many calories and gaining weight
- b. Has extra water in the body*
- c. Needs to drink more fluid
- d. Needs to be getting more exercise to burn calories

13. Beta blocker medications (ex. Coreg, metoprolol, atenolol) are medicines used to treat heart failure. These drugs help the heart pump stronger by: (medication)

- a. Slowing down the heart rate*
- b. Causing blood vessels to get smaller
- c. Relaxing tight blood vessels and blocking salt retention
- d. Improving blood counts (reducing anemia)

14. The best time of day for persons with heart failure to weigh themselves is: (behavior)

- a. At bedtime
- b. Upon awakening in the morning*
- c. At or around lunchtime
- d. When they remember to do it

15. Persons with heart failure should call their doctor if they have which of the following symptoms? (symptoms)

- a. Weight gain of 2-5 pounds in 1-2 days
- b. Increased swelling of the ankles and/or stomach
- c. More shortness of breath
- d. All of the above*

16. Persons with heart failure should exercise: (behavior)

- a. To the point of breathlessness
- b. Most days of the week*
- c. Only at a slow pace that does not cause the heart rate to increase
- d. 1-2 times per week

17. A person with heart failure should stop and rest when doing physical activity if: (symptoms)

- a. They feel short of breath or winded
- b. They have chest pain or discomfort
- c. They feel dizzy or lightheaded
- d. All of the above*

18. Which is a big source of sodium (salt) in the diet? (nutrition)

- a. Processed foods (such as tv dinners)
- b. Smoked or cured meats
- c. Table salt
- d. All of the above*

19. Which has the LOWEST amount of sodium (salt)? (nutrition)

- a. Fresh fruits*
- b. Canned vegetables
- c. Reduced sodium soup
- d. Frozen dinners

20. Which food has the MOST sodium (salt)? (nutrition)

- a. Sliced tomato
- b. Broiled fish
- c. Baked ham*
- d. Skim milk

21. Which dessert has the LOWEST amount of sodium? (nutrition)

- a. Hot fudge sundae
- b. Baked apple*
- c. Low fat instant pudding made with skim milk
- d. Chocolate cake made from a mix

22. Select the fast food with the LOWEST amount of sodium. (nutrition)

- a. Fried chicken
- b. Cheeseburger
- c. Baked potato with sour cream and chives*
- d. Taco salad

23. Some people with heart failure are told by their doctor to limit fluids. Which of the following count as fluids? (nutrition)

- a. Water and clear liquids
- b. Milk, ice cream, and yogurt
- c. Jello, pudding, and soups
- d. All of the above*

24. If a person with heart failure has a headache or pain, which would be the best medicine to take? (medication)

- a. Aspirin
- b. Tylenol (Acetaminophen)*
- c. Advil® or Motrin® (Ibuprofen)
- d. Anacin Regular Strength or Excedrin

25. The recommended total daily amount of sodium that persons with heart failure should eat is:
(nutrition)

- a. Less than 3,000 milligrams*
- b. Greater than 4,000 milligrams
- c. 1,500 milligrams
- d. As close to 0 as possible

Use the picture of the soup label, to answer questions 26 and 27:

26. How many servings are in the can? (nutrition)

- a. 1
- b. 2 ½
- c. 2*
- d. 3

27. How much sodium is in one serving of soup? (nutrition)

- a. 40mg
- b. 950mg*
- c. 475mg
- d. 1900mg

28. A person with heart failure who is trying to limit their fluids may reduce symptoms of thirst by: (symptoms)

- a. Chewing gum or sucking hard candy*
- b. Cutting back on their medications
- c. Drinking small amounts every 30-60 minutes to prevent thirst
- d. Warming fluids before drinking

Nutrition Facts	
Serving Size 1 cup (237g)	
Servings Per Container about 2	
Amount Per Serving	
Calories 100	Calories from Fat 20
% Daily Value*	
Total Fat 2.5g	4%
Saturated Fat 0.5g	3%
Trans Fat 0g	
Polyunsaturated Fat 0.5g	
Monounsaturated Fat 1g	
Cholesterol 25mg	8%
Sodium 950mg	40%
Total Carbohydrate 12g	4%
Dietary Fiber 1g	4%
Sugars 1g	
Protein 7g	
Vitamin A 20%	Vitamin C 0%
Calcium 2%	Iron 4%
* Percent Daily Values are based on a 2,000 calorie diet.	

29. If a person with heart failure forgets to take their medicine, they should: (medication)

- a. Take their medicines as usual the next day
- b. Take the medicines as soon as remembered*
- c. Take double the dose the next day
- d. Call their doctor immediately

30. It is important for a person with heart failure to: (behavior)

- a. Make sure they get the flu shot every year
- b. Receive the pneumovax vaccination to prevent pneumonia
- c. See their heart failure doctor regularly
- d. All of the above*

Appendix G. Study Recruitment Flyer

**Do you need health information to manage
your Heart Failure?**

**A Doctor of Nursing Practice Candidate seeks
Adults ages 18 and older with Heart Failure for a
research study.**



The purpose of the *Using Video-Based Education to Address Health Literacy in Heart Failure* study is to assess the use of videos to improve self-management skills and knowledge in heart failure (HF) patients. The study will also tailor education and hopefully improve health outcomes. The study will involve questionnaires and 6-weeks of watching online heart failure videos (3 to 5 videos per week.) You may also opt into weekly consults with a health care professional. Videos can be accessed during patient appointments or in the comfort of your home with internet access.

Participants must be a patient at UVA or Augusta Health Heart & Vascular Outpatient Clinic.

If interested, please contact the lead researcher:

Paula Atueyi, MSN, FNP-BC
University of Virginia, School of Nursing
◦ **Email: pca7uw@virginia.edu**
◦ **Mobile: (410) 522-8636**
◦ **IRB-HSR # 21881**

Appendix H. Inclusion and Exclusion Criteria Checklist

Date: _____

Name of Reviewer: _____

Age of prospective participant: _____

Gender of prospective participant: M or F

Select the clinical location. (Circle ONE)

UVA Heart and Vascular Center

Augusta Health Heart and Vascular Center

Inclusion Criteria

(Note: Participants must meet ALL inclusion criteria to participate in the project.)

Inclusion Criteria	YES	NO
Diagnosed with heart failure		
Adult patient age 18 years or older		
Receiving care at UVA or AH HF clinic		
Internet access via computer, tablet, or smartphone		

Exclusion Criteria

(Note: selecting YES for any of the choices below will result in an automatic exclusion for the project.)

Exclusion Criteria	YES	NO
Diagnosed with *cognitive impairment		
Legally Blind		
Unable to read and write in English		
Unable to give voluntary consent		

*Cognitive impairment is any intellectual disability that affects one’s mental capacity to make decisions, learn new information, or process memory. (e.g. Dementia, Alzheimer’s disease, etc.)

Does the patient qualify for the study? **YES** **NO** **REFUSED** (Circle one)

If the patient refused, please indicate reasons why in the comments section.

Comments:

Appendix I. Recruitment Information Sheet

A University of Virginia, Doctor of Nursing Practice student is conducting a research study about using video-based education to address health literacy in heart failure patients.

You are being invited to be in this study because you are a patient at the UVA or Augusta Health Heart and Vascular Outpatient Clinic.

The purpose of this research study is to assess the use of videos to improve self-management skills and knowledge in heart failure patients. The study will also tailor patient education and hopefully improve health outcomes.

If you agree to participate, the study will involve completing the attached survey and the attached Stand-Alone HIPAA Authorization. We will also be collecting some information from your medical record such as your name, email address, telephone number, diagnosis of heart failure, and other health co morbidities (e.g. diabetes, high cholesterol).

Study participation is completely voluntary.

The only risk for this study is to your privacy. We will keep all of the information as secure and confidential as possible and in keeping with University of Virginia policies, and HIPAA Regulations.

You will not directly benefit from this study but future patients with your type of condition may benefit from what we learn in this study.

If you feel you understand the study and would like to participate, please complete the attached survey and HIPAA Authorization Form and submit the completed forms to the primary research investigator or designated study team member.

Any questions about this research may be addressed to the primary research investigator, Paula Atueyi, MSN, RN.

For questions about your rights as a research participant, complaints about this research, or research-related injury, you can contact the Office of the Vice President for Research (VPR) at (434) 924-6853 and leave a message. A member of the VPR staff will contact you to address your questions or concern.

Your information will not be shared outside of this study team except to those groups inside and outside of UVA who are responsible for making sure studies are conducted correctly and ethically. If you decide to participate in this study now, but decide later to stop, you need to know that the information already collected will continue to be used.

Thank you for your time,

Paula Atueyi

Principal Investigator: Paula Atueyi

Study Title: Utilizing Video-Based Education to Address Health Literacy in Heart Failure Patients

IRB-HSR #21881

Appendix J. HIPAA Authorization Form

University of Virginia IRB-HSR# 21881

Title: Utilizing Video-Based Education to Address Health Literacy in Heart Failure Patients

HIPAA Authorization
Confidentiality, Use and Disclosure of Health Information
for Research Purposes

Study records that identify you will be kept confidential as required by federal privacy regulations. By signing this form, you agree to allow Paula Atueyi and their study team to use and disclose health information about you to conduct this study. A description of this study is attached to this form.

The information created about you may be shared with other institutions doing this study in a way that does not identify you directly. Other persons who may have access to your records include groups such as

- data and safety monitoring boards which oversee the safety of a study including accrediting agencies,
- the University of Virginia Research Compliance staff and Institutional Review Board (IRB) members or designates. The IRB is a special committee at the University of Virginia that reviews all medical research studies involving human participants.

If you sign this form, you have given us permission to release information to these other people. There is no expiration date to this permission. If you decide to withdraw your permission and end this agreement to release the information collected about you, please contact Paula Atueyi via cell phone (410) 522-8636 or email pea7uw@virginia.edu. She will help you document in writing your decision to withdraw this permission. Please note that any information already obtained will continue to be used.

Because of the need to release information to these parties, absolute confidentiality cannot be guaranteed. There is the potential that information released to the groups and individuals listed above may be released again and would no longer be protected by privacy laws.

Your participation in this research study is voluntary. However, you will not be allowed to participate in this research if you do not sign this Authorization. Refusing to sign will not affect the present or future care you receive at this institution.

Adult Participant

_____ PARTICIPANT (Signature)	_____ PARTICIPANT DATE (Print)
-------------------------------------	---

Minor Participant

MINOR'S NAME

MINOR'S PARENT or GUARDIAN MINOR'S PARENT or
GUARDIAN DATE
(Signature) (Print)

Impartial Witness

If this form is read to the subject because the subject is blind or illiterate, an impartial witness not affiliated with the research or study team must be present for the authorization process and sign the following statement.

The subject may place an X on the Participant Signature line above.

I agree the information in this form was presented orally in my presence and the person had the opportunity to ask questions. I also agree that the person freely gave their authorization to allow the release of their health information.

NAME OF IMPARTIAL WITNESS

SIGNATURE OF IMPARTIAL WITNESS
DATE

Appendix K. Demographic Data Collection Sheet

All answers will be kept confidential.

Name/Participant ID number: _____ Date: _____

Telephone: home or mobile () _____ - _____ Best Time to Call: _____

Email address: _____ Preferred Contact Method: _____

12. Please indicate your age.

13. Please select your gender.

- c. Male
- d. Female

14. Please select your race.

- g. Black
- h. White
- i. Hispanic
- j. Asian
- k. Native American
- l. Other: _____

15. Please select your level of education.

- f. Did not complete high school
- g. High school graduate/GED
- h. Completed some college
- i. College Graduate

- j. Masters or Doctorate degree

16. Please select your employment status.

- e. Unemployed
- f. Employed
- g. Retired
- h. Disabled

17. Please select your relationship status.

- d. Single
- e. Married
- f. Divorced

18. Please select your annual income.

- e. \$0 - \$20,000
- f. \$21,000 - \$50,000
- g. \$50,000 - \$74,000
- h. \$75,000 or more

19. Please indicate your class of heart failure.

- f. Class I: No limitation of physical activity.
- g. Class II: Slight limitation of physical activity. Comfortable at rest but, ordinary physical activity causes shortness of breath.
- h. Class III: Marked limitation of physical activity. Comfortable at rest. Less than ordinary activity causes shortness of breath.
- i. Class IV: Unable to carry on any physical activity without discomfort. Symptoms of heart failure at rest.
- j. Not sure

20. Please select your type of heart failure

- d. Systolic
- e. Diastolic

f. C. Not sure

21. Please select your ejection fraction percentage

e. Less than or equal to 40%

f. Between 41-49%

g. Greater than 50%

h. Not sure


22. Please list all active medical issues (i.e. high blood pressure, diabetes)

Appendix L. HF Clinic Project Presentation

Assessing Health Literacy to Improve
Heart Failure Self-Management through
Video-Based Education Counseling

A DNP Scholarly Practice Project

Paula C. Atuey, MSN, FNP-BC
DNP Advisor: Dr. Kathryn Reid, PhD, FNP-C, RN, CNL
Practice Mentors: Craig Thomas, MSN, ACNP-BC, CHFN
Tami Collins, MSN, AGACNP-BC, CHFN
October 2019





Contents

1. Background/Significance
2. Project Objectives
3. Overview of Project
4. Project Eligibility
5. Methodology/Procedures
6. Sustainability of Project
7. Nursing Implications

Background



- HF affects 6.5 million Americans in the U.S. (AHA, 2017).
- Morbidity and mortality rates still remain high (van Riet et al., 2016).
- Self-care regimens for HF patients are complex and multifaceted (Boyne et al., 2014, Yancey et al., 2013).
- Low health literacy is a barrier to effective self-management in HF (Cajita, Cajita, & Han, 2016).
- No Gold Standard in educating for HF patients (Boyde & Peters, 2014).
- UVA-HS and AH HF clinic current mode of education is primarily oral and written materials.
- HFSA recommends assessment of health literacy and the use of various learning options including videos (Peterson et al. 2011).



Project Objectives

To evaluate the effectiveness of using video-based education (VBE) counseling to improve self-care and heart failure (HF) knowledge in HF patients.

To examine the differences between limited and adequate health literacy groups in improving self-care behaviors and HF knowledge after receiving VBE counseling.





Project Overview

<p>Institutional Review Board Status: Open to enrollment (IRB-HSR #21881)</p> <p>Start date: October 2019</p> <p>Timeframe: 6 weeks</p> <p>Study Design: one group pretest-posttest design</p>	<p>Clinical impact?</p> <ul style="list-style-type: none"> - Cost efficient - Accurately identifies those with limited health literacy and tailors patient education to their learning needs. - Patients have online access to an underutilized educational resource. - 80 % of information is absorbed visually, helpful for retention and comprehension.
--	---


Inclusion and Exclusion Criteria

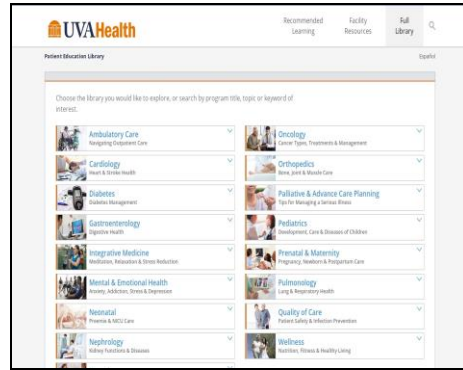
<p><u>Inclusion</u></p> <ul style="list-style-type: none"> • Adult patients 18 years or older • Diagnosis of HF (per ACC/AHA or NYHA guidelines) • All health literacy scores post screening (low, marg., adeq.) • Patients with internet access via PC, tablet, or smartphone 	<p><u>Exclusion</u></p> <ul style="list-style-type: none"> • Patients with cognitive impairment. • Patients who are medically certified as blind. • Unable to read or write in English, or unable to give consent.
---	--



Methodology and Procedures

- **Pre-intervention**
 - Recruitment at HF clinic
 - Staff meeting to introduce study
 - Eligible participants enrolled. Obtain informed consent.
 - Data collection: Baseline S-TOFHLA scores and pretest SCHFI and AHFKT, demographics, and clinical data
- **Intervention**
 - Enroll for individualized weekly support
 - VBE pamphlet and tracking log
 - VBE delivery at clinic or home
 - Monitor patients specifically for educational needs and health concerns.
- **Post-intervention**
 - Participants will be contacted to complete post-test SCHFI and AHFKT.






Sustainability of the Project

- Gain staff engagement: Identify clinic champions/leaders and practice experts for ongoing use of VBE.
- Discuss HL screening and VBE at staff meetings.
- Give each visiting patient a project study flyer during recruitment and educate them about VBE for HF.
- Incorporate video education during 30 min-1 hour patient appointments (e.g. exam room).
- Encourage patients to watch videos after health visit. Follow up w/ enrolled pts.
- Identify and address challenges or barriers to VBE.

Nursing Implications

- Aims to enhance patient education delivery in an outpatient setting.
- Can saving nursing/provider time and increase efficiency.
- Provides continued education after health visit.
- VBE may empower patients to take more responsibility of their health.
- Increases awareness of health literacy and integrates an evidence-based educational tool to individualize care.
- Enhances nursing and provider role by improving communication and providing patient-centered care.



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Appendix M. Heart Failure Video Education Content

Heart Failure Basics


Medications Used to Treat Heart Failure
What is Heart Failure?
Self-Check Plan for HF Management (pdf file)
Managing Your Heart Failure Medications
What is Heart Failure? (pdf file)
Monitoring Symptoms of Heart Failure
Common Tests for Heart Failure
What is a Heart Failure Treatment Plan?
Preparing for Your Doctor's Appointments When You Have Heart Failure
Heart Failure: Making Lifestyle Changes
Heart Failure: Partnering in Your Treatment (pdf file)
HF and Your Ejection Fraction Explained (pdf file)
How Can I Improve My Low Ejection Fraction (pdf file)
Understanding Your Heart's Ejection Fraction
Understanding Ejection Fraction
Heart Failure Warning Signs and Symptoms
Treating Heart Failure: Medications, Devices, and Surgery
Treating Heart Failure: Left Ventricular Assist Devices
Heart Failure: Preparing for Discharge
Your Care at Home: Managing Heart Failure

Living with Heart Failure: Building a Support Network
How to Handle a Heart Failure Flare-Up
Emotions of Heart Failure
Heart Failure: Questions to Ask Your Doctor (pdf file)
Tobacco and Heart Failure: Tips for Quitting
How Can I Live With Heart Failure?
Heart Failure: Symptom Tracker (pdf file)

Heart Failure Lifestyle Changes

Living with Heart Failure: Your Heart-Healthy Diet
Living with Heart Failure: Goals for the Future
Living with Heart Failure: Strategies to Reduce Sodium
Managing Heart Failure: Beware of Fat and Cholesterol
Living with Heart Failure: Reading Nutrition Labels
Managing Heart Failure: Dining Out
Living with Heart Failure: Fluid Guidelines
Living with Heart Failure: Exercising Safely
What Your Heart Failure Diagnosis Means
Avoiding Hospital Readmissions: Heart Failure (Part 1)
Avoiding Hospital Readmissions: Heart Failure (Part 2)
Avoiding Hospital Readmissions: Heart Failure (Part 3)
Avoiding Hospital Readmissions: Heart Failure (Part 4)

Appendix N. Video-Based Education Brochure



DID YOU KNOW?


80% of information is absorbed visually by the brain. Video education can enhance retention and comprehension of health information.

CONTACT

This brochure was developed by
Paula Atueyi, MSN, FNP-BC
Doctor of Nursing Practice-2020
University of Virginia, SON
pca7uw@virginia.edu

IMPROVING YOUR HEART HEALTH WITH VIDEOS

Providing the highest quality of care for our patients




WHAT IS VIDEO EDUCATION?

Video education is the use of audio-visual recording technology that helps learners to explore and increase their knowledge about a topic. There are many educational videos available online.

WHY VIDEO EDUCATION FOR HEART FAILURE?

- Videos can help you learn how heart failure (HF) affects your body.
- Videos can improve your HF knowledge and self-care behaviors
- Videos can help you make lifestyle changes such as limiting sodium, taking new medications, and staying active.



VISIT
UVA.HEALTHCLIPS.COM

- **GO TO FULL LIBRARY**
- **CLICK CARDIOLOGY**
- **CLICK HEART FAILURE**
- **YOU NOW HAVE FREE ACCESS TO EDUCATIONAL HF VIDEOS!**
- **WATCH 3 TO 5 VIDEOS PER WEEK.**


RECOMMENDED VIDEOS

HEART FAILURE BASICS

- "What is Heart Failure?"
- "Monitoring Symptoms of Heart Failure"
- "Managing your HF Medications"
- "How to Handle a HF Flare-Up"
- "HF Warning Signs and Symptoms"

HEART FAILURE LIFESTYLE CHANGES

- "Your Heart Healthy Diet"
- "Strategies to Reduce Sodium"
- "Fluid Guidelines"
- "Reading Nutrition Labels"
- "Avoiding Hospital Readmissions"
- "Exercising Safely"



Appendix O. Video Education Tracking Log
Video-Based Education Tracking Log

Instructions: **Congratulations!** You are taking great steps towards managing your health. Please use this tracking log and your video-based education pamphlet to guide you. You have free unlimited access to watch heart failure education videos online.

How can I access the online videos?

1. Open up your chosen internet browser and visit uva.healthclips.com
2. Click **Full Library** at the upper right-hand corner of the screen. You will see a list of library categories to explore.
3. On the library list to your left, click **Cardiology** (Heart and Stroke Health). This is located underneath Ambulatory Care.
4. After clicking cardiology, a list of sub-categories will appear. Click **Heart Failure**.
5. You now have access to the **Heart Failure Basics** and **Heart Failure Lifestyle Changes** videos. Start with Heart Failure Basics and watch the “*What is Heart Failure?*” video.
6. You will see a list of all the educational videos on the right-hand side. It is encouraged that you watch at least 3 heart failure videos per week.

Study Week (circle one): 1 2 3 4 5 6 7 8 9 10

Number of videos watched this week (circle one): 1 2 3 4 5 6 7 8 9 10

Notes: *(Use this section to write down video title, health information, or questions)*

Appendix P. UVA Institutional Review Board Assurance Form

ASSURANCE FORM

University of Virginia

Institutional Review Board for Health Sciences Research

HIPAA Privacy Board

IRB - HSR # 21881	
Event: Type: Determination of Exempt Research Protocol with Limited IRB Review - Exempt with Limited IRB Review	
Sponsor(s):	
Sponsor Protocol #:	
Principal Investigator: Paula Atueyi, BSN, MSN	
Title: Utilizing Video-Based Education to Address Health Literacy in Heart Failure Patients	
Assurance: Federal Wide Assurance (FWA)#: 00006183 UVa IRB #1 Registration IRB#00000447	
Certification of IRB Review: The IRB-HSR/HIPAA Privacy Board abides by 21CFR50, 21CFR56, 45CFR46, 45CFR160, 45CFR164, 32CFR219 and ICH guidelines as compatible with FDA and DHHS regulations. This activity has been reviewed in accordance with these regulations.	
Event Date: 09/23/19	
Protocol Expiration Date: 09/23/23	
Number of Subjects:	
UVA Site Only	
Data Security Plan Date: 09/19/19	
Current Status: Open to enrollment	
Consent Version Dates:	

HIPAA Authorization Stand Alone Form -- 09/19/19

Committee Members (did not vote):

Comments: The purpose of this study is to enhance patient education by using video-based education (VBE) to improve self-care behaviors and heart failure (HF) knowledge in adult HF patients.

The study will involve recruitment and enrollment of patients with Heart failure who will engage in the educational program, and complete pre and post assessments. The study also involves gleaning identifiable information from the medical record.

There is no outside sponsor for this study.

The following documents were submitted with this protocol:

1. Patient Demographics Data Sheet
2. Pre VBE Short Test of Functional Health Literacy in Adults.
2. Pre VBE Self Care of Heart Failure Index.
3. Pre VBE Atlanta Heart Failure Knowledge Test
4. Post VBE Self Care of Heart Failure Index.
5. Post VBE Atlanta Heart Failure Knowledge Test

This study was submitted initially as QI and reviewed by the IRBHSR QI Committee who determined this

project met the criteria for Human Subject Research.

This study is now open to enrollment.

REGULATORY INFORMATION:

PRE AND POST VBE evaluations

CATEGORY # 2(i)

This study met the criteria for an exempt determination per 45CFR46.104(d)2(i).

Research that includes only interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures,

interview procedures, or observation of public behavior (including visual or auditory recording) and (i) the information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

PROJECT DEMOGRAPHICS DATA SHEET (INTERVIEW PORTION)

CATEGORY # 2(iii)

This study met the criteria for an exempt determination per 45CFR46.104(d)2(iii).

Research that includes only interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) and (iii) the information obtained is recorded by the investigator in such a manner that the identity of human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited review to make the determination required by 45 CFR 46.111(a)(7) .

Per 45CFR46.110(b)(iii) the IRB conducted an expedited limited IRB review required by 45CFR46.111(a)(7) and determined that the study provides an adequate plan to protect the privacy of subjects and the confidentiality of their information.

VIDEO-BASED EDUCATIONAL INTERVENTION CATEGORY # 3(ii) For the purpose of this provision, benign behavioral interventions are brief in duration, harmless, painless, not physically invasive, not likely to have a significant adverse lasting impact on the subjects, and the investigator has no reason to think the subjects will find the interventions offensive or embarrassing. Provided all such criteria are met, examples of such benign behavioral interventions would include having the subjects play an online game, having them solve puzzles under various noise conditions, or having them decide how to allocate a nominal amount of received cash between themselves and someone else.

PROJECT DEMOGRAPHICS DATA SHEET (MEDICAL RECORD REVIEW)

CATEGORY # 4(iii)

This study met the criteria for an exempt determination per 45CFR46.104(d)4(iii).

Secondary research for which consent is not required: Secondary research uses of identifiable private information or identifiable biospecimens, and (iii) The research involves only information collection and analysis involving the investigator's use of identifiable

health information when that use is regulated under 45CFR parts 160 and 164, subparts A and E, for the purposes of 'health care operations' or 'research' as those terms are defined at 45CFR 164.501 or for 'public health activities and purposes' as described under 45CFR 164.512 (b).

HIPAA REGULATIONS:

The IRB-HSR has granted Waiver of HIPAA Authorization via 45CFR 164.512(i)(2) to contact subjects by direct contact by a person who is not their health care provider. Direct contact may include phone, letter, direct email or approaching potential subjects while at UVA. Phone, letter or emails will be approved by

the IRB-HSR prior to use. The following HIPAA identifiers may be collected: Name, medical record number, date of birth and contact information appropriate to the recruitment plan. The minimum necessary PHI to be collected includes only those items related to the inclusion/ exclusion criteria.

The health information to be collected per the PROJECT DEMOGRAPHICS DATA SHEET in meets the criteria of Identifiable per HIPAA regulations. The collection of identifiable health information at UVA will be done under a written HIPAA Authorization. Sharing of the identifiable health information outside of UVA will be authorized under a signed study specific HIPAA Authorization: English Version.

Health Information collected in the PRE AND POST EVALUATION portions of the study meet the criteria of deidentified under HIPAA.

Any health information shared outside of UVA will be de-identified.

Approved with this determination are the following recruitment material(s):

1. Flyer dated 09-19-19
2. Information Sheet-Recruitment Information for Exempt with Written HIPAA Authorization dated

09-19-19

RECEIVING FROM OR SENDING DATA/SPECIMENS EXTERNAL TO UVA

You are required to consult with your office of grants and contracts to determine if an agreement is required to receive data/specimens from outside UVA or to send data/specimens outside of UVA.

DATA PROTECTION

You are required to protect the data according to the enclosed Privacy Plan and the Data Security Plan.

PERSONNEL CHANGES

You must notify the IRB of any new personnel working on the study PRIOR to them beginning work.

MODIFICATIONS

If you need to modify the procedures in this study, you must submit an email to IRBHSR@virginia.edu describing the changes before they are implemented. If changes will affect the Exempt application, send the changes with tracked changes to the document.

The IRB-HSR will determine if the project continues to meet the criteria for exempt research.

CLOSURE

Send an email to IRBHSRadmin@virginia.edu within 30 days of closing this study. Include the IRB-HSR# or UVA Study Tracking # of this study in the email. An IRB-HSR Closure Form is not required.

ADDITIONAL INFORMATION

See educational resources for research
<http://www.virginia.edu/vpr/irb/hsr/education.html>

The IRB-HSR official noted below certifies that the information provided above is correct and that, as required, future reviews will be performed and certification will be provided.

Name: Karen Mills, RN

Title: Experienced Designated Member of the IRB-HSR, Institutional Review Board for Health Sciences Research

Phone: 434-924-9634 Fax: 434-924-2932

Name and Address of Institution: IRB for Health Sciences
Research University of Virginia, PO Box 800483
Charlottesville, VA 22908

OR

IRB for Health Sciences Research

DATA PROTECTION

You are required to protect the data according to the enclosed Privacy Plan and the Data Security Plan.

PERSONNEL CHANGES

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MODIFICATIONS

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The IRB-HSR will determine if the project continues to meet the criteria for exempt research.

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Name: Karen Mills, RN

Title: Experienced Designated Member of the IRB-HSR, Institutional Review Board for Health Sciences Research

Phone: 434-924-9634 Fax: 434-924-2932

Name and Address of Institution: IRB for Health Sciences
 Research University of Virginia, PO Box 800483
 Charlottesville, VA 22908

OR

IRB for Health Sciences Research

One Morton Drive, Suite 400

Charlottesville, VA 22903

Approval: Approved by Karen Mills, RN From IP Address: 128.143.1.125	Date: 09/23/19 at 02:29 PM
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Appendix Q: Journal Guidelines

The Journal of Cardiac Failure

Your Paper Your Way

We now differentiate between the requirements for new and revised submissions. You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.

Introduction

The *Journal of Cardiac Failure* publishes peer-reviewed manuscripts of interest to clinicians and researchers in the field of heart failure and related disciplines. These include original communications of scientific importance and review articles involving clinical research, health services and outcomes research, animal studies, and bench research with potential clinical applications to heart failure. The Journal also publishes manuscripts that report the design of ongoing clinical trials and editorial perspectives that comment on new developments pertinent to the field of heart failure or manuscripts published in other journals.

Contact details

Authors may send queries concerning the submission process, manuscript status, or journal procedures to the Editorial Office, aleong@hfsa.org.

Submission checklist

You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:

- E-mail address
- Full postal address

All necessary files have been uploaded:

Manuscript:

- Include keywords
- All figures (include relevant captions)
- All tables (including titles, description, footnotes)
- Ensure all figure and table citations in the text match the files provided

- Indicate clearly if color should be used for any figures in print
Graphical Abstracts / Highlights files (where applicable)
Supplemental files (where applicable)

Further considerations

- Manuscript has been 'spell checked' and 'grammar checked'
- All references mentioned in the Reference List are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources (including the Internet)
- A competing interests statement is provided, even if the authors have no competing interests to declare
- Journal policies detailed in this guide have been reviewed
- Referee suggestions and contact details provided, based on journal requirements

Ethics in publishing

Please see our information pages on [Ethics in publishing](#) and [Ethical guidelines for journal publication](#).

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Published research must be in compliance with human studies guidelines and animal welfare regulations. Authors should indicate in the manuscript that human subjects have given informed consent and that the institutional committee on human research has approved the study protocol. Similarly, they should indicate that studies involving experimental animals conform to institutional standards.

Conflict of interest

If a potential conflict exists, its nature should be stated for each author and the information should be outlined in the Disclosure section of the manuscript. When there is a stated potential conflict of interest and the editors consider that it may have relevance to the accompanying paper, a footnote will be added indicating the author(s)' equity interest in or other affiliation with the identified commercial firms.

All potential conflicts of interest must be identified within the text of the manuscript, under the conflicts with interest heading. This includes relationships with pharmaceutical and biomedical device companies or other corporations whose products or services are related to the subject matter of the article. Such relationships include, but are not limited to, employment by an industrial concern, equity or stock ownership by authors or family member, membership on a standing advisory council or committee, being on the board of directors or publicly associated with the company or its products. Other areas of real or perceived conflict of interest could include receipt of honoraria or consulting fees or receiving grants or funds from such corporations or individuals representing such corporations. See also <https://www.elsevier.com/conflictsofinterest>. Further information and an example of a Conflict of Interest form can be found at:

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Submission form

Original works will be accepted with the understanding that they are contributed solely to the *Journal of Cardiac Failure*, are not under review by another publication, and have not previously been published except in abstract form. Accepted manuscripts become the sole property of the journal and may not be published elsewhere without the consent of the *Journal of Cardiac Failure*. A form stating that the authors transfer all copyright ownership to the journal will be sent from the publisher when the manuscript is accepted; this form must be signed by all authors of the article.

The submission form includes three statements: (1) that there has been no duplicate publication or submission elsewhere of any part of the work (excluding abstracts), (2) that all authors have read and approved the manuscript, and (3) that there are no financial or other relations that could lead to a conflict of interest. This form must be downloaded, signed by all authors, and faxed to the editorial office.

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Submission of an article implies that the work described has not been published previously (except in the form of an abstract, a published lecture or academic thesis, see '[Multiple, redundant or concurrent publication](#)' for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service [Crossref Similarity Check](#).

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Contributors

Each author is required to declare his or her individual contribution to the article: all authors must have materially participated in the research and/or article preparation, so roles for all authors should be described. The statement that all authors have approved the final article should be true and included in the disclosure.

Authorship

All authors should have made substantial contributions to all of the following: (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted.

Changes to authorship

Authors are expected to consider carefully the list and order of authors **before** submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only **before** the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the **corresponding author**: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors **after** the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

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