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# The Effect of an Educational Video on Device-Related Concerns in a Single-Center Left Ventricular Assist Device Population

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DNP Final Project Report

# The Effect of an Educational Video on Device-Related Concerns in a Single-Center Left Ventricular Assist Device Population

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# Dedication

This work is dedicated to my parents, Melanie and Gary, whose belief in me has always far surpassed the belief I have in myself. I strive to make you both proud in everything that I do. There were times during this process that I was ready to give up, and in those moments, the unwavering faith you two had in me pushed me to finish what I started. This is for my sisters, Sloane and Anna, who I hope to inspire to chase relentlessly after whatever it is that they want out of this life. This is for Ricardo, the man who has loved and supported me through every dream I've chased since we were kids. This is for every sacrifice you have made to allow me to complete this degree. This is for our future. This project is not just a culmination of four years of hard work, but it is every word of encouragement that these people have given me throughout the duration of this program to get me to this point.

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## Abstract

PURPOSE: The purpose of this study is to evaluate the prevalence of various concerns among left ventricular assist device (LVAD) patients and evaluate the effect of an educational video intervention on reducing those concerns in a single-center adult LVAD population.

METHODS: A 15-point LVAD Concerns Scale was created to evaluate the prevalence of specific device-related concerns. An educational video was created to address the concerns presented in the LVAD Concerns Scale. Data collection took place from November 2018 to February 2019. A cross-sectional, pre- post-test implementation study design was used to both identify various device-related concerns that exist among LVAD patients and examine the effectiveness of an educational intervention on reducing patients' device-related concerns.

RESULTS: Of the available LVAD patients who met inclusion criteria, 30 were enrolled to participate. The designed LVAD Concerns Scale was found to have acceptable reliability. Participants' LVAD-related concerns were significantly reduced following implementation of the LVAD Concerns Video.

CONCLUSION: Implementation of an educational intervention tailored to address LVAD patients' specific device-related concerns resulted in a statistically significant decrease in those concerns. With the disparity between the number of patients awaiting heart transplantation and the number of available donor hearts, LVADs are being used with increased frequency to treat advanced heart failure. However, available education is suboptimal. Further development of education is required to improve patient outcomes.

# The Effect of an Educational Video on Device-Related Concerns in a Single-Center Left Ventricular Assist Device Population

## Introduction

The prevalence of heart disease continues to climb, with over 28 million adults living with the condition (CDC, 2017). Progression of the disease process leads to heart failure, a chronic, progressive, debilitating condition characterized by the heart's inability to pump an adequate amount of blood and oxygen to meet the body's needs (American Heart Association, 2017). Heart failure affects an estimated 6.5 million adults in the United States (Heart Failure Society of America, 2019). Despite advances in cardiovascular risk prevention, the prevalence of heart failure continues to increase. It is estimated that more than 900,000 new patients are diagnosed with heart failure each year (Dillworth et al., 2018) and the prevalence of the disease is expected to increase to greater than 8 million people diagnosed by the year 2030 (Heart Failure Society of America, 2019). Heart disease is the leading cause of death for both men and women, estimated to contribute to 1 in every 4 deaths (CDC, 2017). Of those whose disease progresses to failure, half will die within 5 years (CDC, 2019; Casida et al., 2011). While heart failure cannot be cured, it can often be managed through strategies to improve symptoms. Those patients with advanced disease who are unable to be further medically managed may require advanced, invasive therapies. Historically, the treatment of choice for severe, advanced heart failure has been transplantation. However, the number of patients awaiting heart transplantation worldwide has doubled in the last 15 years (Prinzing et al., 2016), yet the number of available donor hearts has not increased at the same rate, creating a significant health disparity. In 2018, 314 patients died while awaiting heart transplantation and an additional 340 patients became too sick to transplant (U.S. Department of Health and Human Services, n.d.). Consequently, because of the lack of available donor hearts more than 600 patients suffered and were not transplanted. This

disparity has resulted in the use of mechanical circulatory support (MCS) devices with increasing frequency (American Heart Association, 2017).

Left ventricular assist devices (LVADs) are the fastest growing treatment for advanced heart failure, with nearly 2,500 implantations per year in the United States (Kostick et al., 2018). From 2012 to 2016, there were 13, 279 LVADs implanted as a primary device (The Data and Clinical Coordinating Center University of Alabama Birmingham, 2017). An LVAD is a surgically implanted mechanical pump that attaches to the heart and functions to assist the heart in pumping by continuously pulling blood from the left ventricle and placing it into the aorta, thus imitating restoration of the physiologic function of the damaged left ventricle (Casida et al., 2011). While these devices can improve survival rates, quality of life, and functional capacity in appropriately selected patients with end-stage heart failure (Verdoorn et al., 2017; Iacovetto et al., 2014), they remain associated with considerable risks and require significant lifestyle changes post-implantation (Iacovetto et al., 2014; Allen et al., 2018; Metzger et al., 2016; Thompson et al., 2015). The complexity and invasiveness of these devices yield many concerns among patients and their caregivers, presenting providers with unique educational challenges when caring for patients who are considering or who have received an LVAD.

High quality educational materials are particularly important in the setting of active medical decision-making (Iacovetto et al., 2014) yet for many key decisions involving new, life-prolonging technologies, education, consent, and shared decision-making processes are suboptimal (Allen et al., 2018). Patient decisions to undergo LVAD implantation are often made reflexively, quickly, and intuitively without understanding the LVAD in the larger context of treatment options (Bruce et al., 2015). As well, many patients do not see declining an LVAD as an option (Thompson et al., 2015). While many educational materials of various modalities

exist regarding LVAD therapy, the materials are written at a literacy level that exceeds the comprehension abilities of the average American and the content is substandard (Iacovetto et al., 2014; Thompson et al., 2015). When reviewing the current educational materials available to LVAD patients and those considering LVAD implantation, a majority of the materials are informational and do not present alternative treatment options; are distributed by manufacturers, presenting a clear conflict of interest; describe the benefits of LVAD therapy with insufficient presentation of the risks; use outdated statistics; and are biased toward accepting LVAD therapy (Iacovetto et al., 2014; Thompson et al., 2015). There is an urgent necessity for decisional support for LVAD treatment due to poor patient understanding about the capabilities, lifestyle implications, and risks of LVADs (Kostick et al., 2018).

Patient and caregiver education regarding complex medical therapies, such as LVAD implantation, is an area of continuing development (Iacovetto et al., 2014). The Centers for Medicare and Medicaid Services (CMS) emphasize the importance of patients and caregivers being equipped with the knowledge and support to make informed decisions about care (Verdoorn et al., 2017). Yet some discord exists in patients' quality of life expectations pre- and post-implantation (Kitko et al., 2016), which may be partially attributed to unaddressed LVAD-related concerns and inadequate education to alleviate those concerns. Currently, there are limited evidence-based educational materials available that address specific concerns related to living with an LVAD. In patients with heart failure, nurse educator-delivered patient education prior to discharge results in improved outcomes, increased adherence, and reduced costs (Koelling et al., 2005). It is hypothesized that similar outcomes will be seen in patients implanted with LVADs. In order to develop educational materials that will adequately address specific LVAD-related concerns, it is essential to define those concerns. Evaluating specific device-related concerns in LVAD patients is essential to understanding gaps in the LVAD-related

education provided to this patient population. Patients considering LVAD implantation often worry about becoming debilitated with the device and a burden to their families; the future with the device; disfigurement and altered body image; and how the device will change their lifestyle, relationships, and environment (Dillworth et al., 2018). There is currently limited research on patients' LVAD-related concerns and no research exists to evaluate outcomes following an educational intervention tailored towards addressing those concerns. Tailored educational materials may mitigate patients' device-related concerns and improve their perceived quality of life following implantation. This project aims to describe specific LVAD-related concerns that exist among patients living with an LVAD and fill an educational gap by developing a video that addresses common concerns noted in clinical practice among this population.

## Purpose

As LVADs continue to be implanted with increased frequency as a treatment modality for patients with end-stage heart failure, the urgent need for improved education addressing lifestyle considerations and concerns is heightened. The purpose of this study is to describe specific LVAD-related concerns and implement an educational video to address those concerns. Through a pre- and post-test implementation model, the effect of the educational intervention on specific device-related concerns is identified. The goal is to improve patient education regarding lifestyle considerations and concerns associated with living with an LVAD.

## Methods

This study was a single-center, cross-sectional, pre- post-test design. The study aimed to identify various LVAD-related concerns and examine the effect of an educational video intervention on patients' specific device-related concerns.

**LVAD Concerns Scale**

Research has been done in the past regarding concerns among patients with implantable cardioverter-defibrillators (ICD). It is hypothesized that similar concerns may exist among patients with other life-prolonging, invasive therapies. Thus, using the ICD concerns scale as a model (Pedersen et al., 2005; Thylen et al., 2016), in combination with concerns noted in clinical practice among providers caring for LVAD patients, a 15-point concerns scale was created. This LVAD Concerns Scale is a Likert Scale scored from 0 to 4, with 0 being not concerned at all, 1 being a little bit concerned, 2 being somewhat concerned, 3 being quite a bit concerned, and 4 being very much concerned. See Figure 1 for full scale. The scale underwent revision from LVAD experts and a survey developer before it was finalized. This scale has demonstrated internal consistency with a Cronbachs $\alpha$ of 0.911.

**LVAD Concerns Educational Video**

An educational video was then created to address the various concepts in the LVAD Concerns Scale. The LVAD Coordinators along with a team of health education specialists at UK Healthcare aided in the video development to ensure that device-related concerns noted among LVAD patients in clinical practice and in the literature were addressed, and to ensure that the health literacy of the video was at a level that would be understood by all participants.

**Setting**

The UK HealthCare patient care enterprise is the largest system in the Lexington, KY area including four hospitals along with numerous other clinics, centers, and outreach locations across the state of Kentucky. Albert B. Chandler Hospital and the Gill Heart and Vascular Institute house the MCS department and LVAD program and is thus, the primary location of this study. Albert B. Chandler Hospital and the Gill Heart Institute provide services to patients all across the state of Kentucky, as well as the surrounding regions. Albert B. Chandler

Hospital is a 569-bed acute care hospital and is the only Level I trauma center in Central and Eastern Kentucky. The cardiothoracic surgery program at the Gill Heart and Vascular Institute provides specialized care for heart failure patients including cardiac-assist devices and heart transplantation. Currently, UK is the larger of two LVAD programs in the state of Kentucky. The Gill Heart and Vascular Institute first received the Joint Commission's Gold Seal of Approval in 2009 and has maintained the certification since that time, indicating its compliance with the Joint Commission's national standards for healthcare quality and safety in LVAD care.

**Sample**

Patients included in the study were those that a.) have an implanted LVAD for the treatment of end-stage heart failure; b.) have had the LVAD implanted for at least 30 days; c.) are able to complete the three-question assessment following consent to ensure understanding of both the consent and study itself; and d.) are able to speak and write in English. Patients were excluded from the study if they were a.) less than 18; b.) institutionalized or reside in an extended care nursing facility; and/or c.) unable to complete the three-question assessment indicating understanding of the consent and study. The patient population of interest are patients diagnosed with end-stage heart failure who had been implanted with an LVAD, under the care of the LVAD team at UK HealthCare. Data collection took place from November 2018 to February 2019. All patients implanted were reviewed for eligibility with only those meeting inclusion criteria referred by the LVAD coordinators and contacted for potential participation. Thirty patients (n=30) met inclusion criteria and consented to participate in the study. Of note, one participant was blind and therefore was unable to watch the video and complete the post-video LVAD-concerns scale. This resulted in a post-video sample size of 29 participants (n=29).

**Data Collection**

Approval from the University of Kentucky Institutional Review Board (IRB) was obtained prior to the collection of data. The LVAD Coordinators at UK Healthcare referred all patients for participation to the research team. A project member, either the primary investigator (PI) or co-investigator (CO-I), then contacted those patients referred by the LVAD Coordinators to identify interest in participation. Either the PI or CO-I then set up in-person meetings with those patients who agreed to participate to provide a full explanation of the study. In-person meetings were set up at a location of the patient's choosing, which included patient homes, the Gill Heart and Vascular Clinic, and inpatient at UK Albert B. Chandler Hospital. All meetings took place in private, with just the PI and/or CO-I present with the patient. The presence of family or other individuals was left up to the participant. If other individuals accompanied the participant, the PI and/or CO-I ensured that the participant did not enlist the help or opinions of those individuals throughout the duration of the study. The purpose and procedures of the study were described, and all questions answered prior to obtaining signed informed consent. Potential participants were assured that they would not incur any additional costs because of their participation in the study. As well, potential participants were advised that they may withdraw from participation at any time. Following explanation of the consent and answering any questions, potential participants were asked to answer three questions in order to indicate their understanding of the consent and the study. If participants were unable to answer all three questions correctly, they were remediated again through the consent form. After remediation, the patient was asked to answer the three questions again. If they were unable to answer correctly, they were told that they are not eligible for the study. This did not occur throughout the duration of this study. A copy of each patient's informed consent was kept on file and separate from all other identifiable data collection. A copy of the signed consent form was also provided to the

patient at the time of enrollment. Each data sheet was coded with a unique participant number and stored in a locked file cabinet in a locked research office that is key entry only. Data were collected using paper questionnaires and then transferred to the REDCap system, a secure web-based application for building and managing databases. All REDCap data are stored on a secure web server located behind a firewall on the University of Kentucky network. A trained data manager monitored data collection. Demographic data was obtained via a survey that participants filled out prior to the questionnaire along with review of patients' medical records. Patients who agreed to participate and completed the study were given twenty dollars in the form of a check that was mailed to an address provided by the patient.

**Data Analysis**

The study was completed using a cross-sectional design. Data related to LVAD concerns, demographic data, and other survey related information were self-reported; medical history, lab vales, and indication for LVAD were obtained from the participants medical records. To describe patient characteristics, means ± standard deviations were used for continuous level variables and frequency and proportions were used for categorical variables. In order to evaluate and compare the scores from each individual question on the LVAD Concerns Scale as well as total scores, a Wilcoxon Signed Ranks Test was used. This is a more robust test for small sample sizes and non-normally distributed data. Thus, given the sample size of 30 participants in this study and an abnormal data distribution, this test was chosen.

## Results

**Sample Characteristics**

A total of 30 LVAD patients agreed to participate. The mean age was 57 years, with the majority of patients being Caucasian (90%) and male (76.7%). Half of the sample size was married, with the other half being either single (23.3%) or divorced/separated/widowed (26.7%).

All patients had a New York Hospital Association (NYHA) Classification of either III or IV, with a majority having a NYHA Classification of IV (70%). Additionally, a majority of participants had their LVAD implanted as destination therapy (DT) (63.3%). On average, participants had their LVADs implanted for 702 days, with a range of 34 to 2472 days. See Table 1 for a full list of demographic data.

**Outcomes**

Implementation of the LVAD Concerns Video resulted in a significant reduction in LVAD related concerns. Using the Wilcoxon Signed Ranks Test, mean scores pre- and post-video were 22 ± 14 and 17 ± 13, respectively (p-value 0.002). This indicates that the LVAD Concerns Video significantly reduced the overall concerns of participants. Refer to Table 2 for a comparison of overall concern pre- and post-video implementation.

Initially, participants were most concerned about being a burden to their family (2.07 ± 1.46), the LVAD abruptly stopping (2.07 ± 1.5), having no warning the LVAD would malfunction (2.00 ± 1.66), and not being able to do the things that they love (1.80 ± 1.32). Participants were least concerned about exercise causing the LVAD to malfunction (0.83 ± 0.99) and the symptoms or pain associated with the LVAD (0.90 ± 0.92) on the pre-video assessment. The most significant reduction in concerns pre- and post-video was seen in participants' concerns about traveling with their LVAD, 1.57 ± 1.36 pre-vide to 0.76 ± 0.99 post-video (p-value 0.001). Five other concerns on the scale resulted in a statistically significant reduction in participants' concerns following implementation of the LVAD Concerns Video, which included concerns about the LVAD abruptly stopping (p- value 0.007), having no warning the LVAD is going to stop working (p-value 0.009), making love(p-value 0.010), working too hard (p-value 0.01), and the battery dying (p=0.032). Refer to Table 3 for a full breakdown of concern prevalence pre- and post-video implementation.

## Discussion

This study aimed to both identify specific LVAD-related concerns and evaluate the effect of an educational video intervention on reducing those concerns. Education across the spectrum of pre- to post-implantation is inadequate and patients are often left with a plethora of unaddressed concerns, leading to a discrepancy in their pre- and post-implantation expectations (Iacovetto et al., 2014; Kitko et al., 2016). Overall, implementation of the LVAD Concerns Video resulted in a statistically significant reduction in participants' device-related concerns.

Many of the points from the LVAD Concerns Scale that most participants worried about were related to the device itself and the possibility of the device failing. Patients' lives depend on the device functioning appropriately. A majority of participants had been implanted months to years prior to participation and had not experienced any malfunction of the device, yet many were still concerned that their device would stop functioning abruptly and that they would have no warning that their device would malfunction. The LVAD Concerns Video significantly reduced participants' concerns regarding the LVAD abruptly stopping and having no warning the LVAD would malfunction, indicating that previous patient education may not have adequately addressed these points.

Participants also had significant concerns about being a burden to their family. Part of the screening process prior to LVAD implantation evaluates patients' support systems. It is expected that information and knowledge will be provided to both potential LVAD recipients and their caregivers during the decision process regarding the lifestyle adjustments that will take place following implantation, including the dependence that the LVAD recipient will have on their family for appointment follow-up, medication management, dressing changes, etc. This pre-implantation evaluation is designed to ensure that the recipient has a dependable and willing caregiver to assist them in their day-to-day needs once implanted. However, a majority of

patients were still concerned about being burdensome to their caregivers and their family. While a reduction in these concerns was noted following implementation of the video, this reduction was not statistically or clinically significant. These concerns may be inherent to LVAD patients. People who were once independent now rely heavily on those around them, and education may not resolve those concerns. However, discussions with patients and caregivers about this topic should be ongoing and education should adequately explore the lifestyle implications of LVAD implantation on both the patient and caregiver.

Concerns surrounding the inability to do the things that the patients love were also rated amongst the highest concerns on the scale. These devices require significant lifestyle changes and the majority of patients are not able to live the lifestyle that they lived prior to implantation. Many activities are restricted, whether due to functional capacity following implantation or being hooked to a mechanical device at all times. This can potentially distress patients if they are not adequately educated on the lifestyle adjustments that will result following LVAD implantation. The participants had all been living with their LVAD for more than 30 days, with most participants having their LVAD for almost two years, yet the inability to do the things that they love remained among one of the highest rated concerns. The LVAD Concerns Video did not significantly alter participants' concerns related to their ability to do the things that they love. This highlights the necessity of adequate and thorough education regarding lifestyle adjustments and implies that this education may better prepare patients if given prior to implantation so that patients can be equipped for life following LVAD implantation.

The point with the most reduction post-video implementation was that regarding participants' concerns about traveling. While this was not one of the highest rated concerns pre-video, it had the most statistically significant reduction post-video. This emphasizes a lack of knowledge regarding the ability to travel with an LVAD, and an inadequacy of current

educational materials to address traveling with an LVAD. There was no difference in concerns regarding the future with the LVAD pre- and post-video. This is likely due to the length of LVAD therapy of participants. A majority of participants had been living with their LVAD for a substantial amount of time, so the idea of living with a mechanical device was not new. As well, a majority of participants were implanted as destination therapy, so the possibility of transplantation was not a consideration or potential concern related to their future.

Overall, none of the concerns on the LVAD Concerns Scale had mean scores higher than 2.07 pre-video implementation. This relatively low average rating of the concerns is likely due to the length of time that the participants had been living with their LVAD. The concerns of LVAD patients may decrease over time as they adjust to life with an LVAD and fall into a routine of normalcy living with an implanted mechanical device. Patients' concerns during the decision process, when considering LVAD implantation, or immediately post-implantation are likely much higher than they are once they have been living with their device for a considerable amount of time. Thus, if this study were replicated at these earlier timepoints, the results would likely yield higher mean scores and the educational intervention may produce greater significance in reducing those concern scores.

This study highlights that current educational materials available to LVAD patients are suboptimal and illustrates that an educational intervention specifically tailored to address the concerns of LVAD patients significantly reduces those concerns. Patients who are healthier at baseline report a lower quality of life following LVAD implantation (Stehlik et al., 2017). This may be related to specific LVAD concerns. These patients are more functional prior to implantation, and thus, their lifestyle changes post-implantation are more drastic, creating discord between their expectations pre- and post-implantation. This video, along with other educational materials that aim to address concerns, may improve the quality-of-life of patients by

addressing their concerns and preparing them for the lifestyle changes that will result from LVAD implantation.

## Limitations

Several limitations were noted in the design of this study. First, the study took place at a single LVAD center. Thus, the results may solely reflect the concerns of patients at our center and not be inclusive of those at other centers. The sample size was also small. With only 30 participants, results may have differed if more participants were included. Both of these factors limit the generalizability of the study. As well, the LVAD Concerns Scale was new and previously untested prior to this study. Though the scale was found to have acceptable reliability, it is unclear whether this scale would accurately and comprehensively capture the concerns of LVAD patients across various institutions and regions. Finally, the LVAD Concerns Video was created based off of the LVAD Concerns Scale, thus it may not systematically address the concerns of those patients at other institutions and in various regions. Each institution manages their LVAD patients differently, thus the video may solely reflect educational points that pertain to the population of patients at our center.

## Conclusion

Patients and caregivers are not equipped with the knowledge or education necessary to make informed decisions regarding invasive, life-sustaining therapies, such as LVAD implantation, or to prepare them for living with their device. Future research should evaluate how patients' concerns change from pre-implantation to post-implantation, specifically assessing how patients' concerns may reduce over time. This would allow education to be tailored to patients based on where they are on the continuum of LVAD therapy. As well, this study may be replicated pre-implantation as part of a decision-aid or immediately post-implantation as part of discharge teaching. Both of these are critical times for patients and caregivers. Adequate

education at these timepoints is necessary to ensure that patients are making informed decisions, have improved outcomes, have realistic expectations, and have an enhanced quality of life. Caregivers play a vital role in this population, so I also recommend a similar study be conducted to address the concerns of caregivers of patients with LVADs. Additionally, I recommend evaluating palliative care's role in this population and the effect that this team can have on the concerns of patients with LVADs. Finally, further education needs to be developed to address other areas of LVAD therapy and should be evaluated for its adequacy.

The goal of this study was to identify specific device-related concerns among LVAD patients and evaluate the effect of an educational video intervention on reducing those concerns. The LVAD Concerns Scale was noted to have acceptable reliability in identifying patients' device-related concerns and the LVAD Concerns Video significantly reduced patients' concerns. Incorporation of this video into clinical education may aid in aligning pre- and post-implantation expectations and improve patients' quality-of-life following LVAD implantation. This study confirms the inadequacy of current educational practices and emphasizes the need for improved materials, highlighting a reduction in concerns with implementation of an educational intervention specifically tailored to address concerns of LVAD patients. Further development of educational materials specifically tailored to LVAD patients could transform the patient experience and significantly improve patient outcomes.

References

Allen, L., McIlvennan, C., Thompson, J., Dunlay, S., LaRue, S., Lewis, E., Patel, C., Fairclough, D., Leister, E., Glasgow, R., Cleveland, J., Phillips, C., Baldridge, V., Walsh, M., & Matlock, D. (2018). Effectiveness of an intervention supporting shared decision making for destination therapy left ventricular assist device: The DECIDE-LVAD randomized clinical trial. *JAMA Internal Medicine, 178(4),* 520-529.

American Heart Association (2017). Devices and surgical procedures to treat heart failure. Retrieved from http://www.heart.org/HEARTORG/Conditions/HeartFailure/TreatmentOptionsFo HeartFailure/Devices-and-Surgical-Procedures-to-Treat-Heart Failure_UCM_306354_Article.jsp#.WnstRyPMyHo

American Heart Association (2017). What is heart failure? Retrieved from http://www.heart.org/HEARTORG/Conditions/HeartFailure/AboutHeartFailure/ hat-is-Heart-Failure_UCM_002044_Article.jsp#.Wnsw5yPMyHp

Casida, J., Marcuccilli, L., Peters, R., & Wright, S. (2011). Lifestyle adjustments of adults with long-term implantable left ventricular assist devices: A phenomenologic inquiry. *Heart and Lung, 40(2011),* 511-520.

Centers for Disease Control and Prevention (2017). Heart failure fact sheet. Retrieved from https://www.cdc.gov/heartdisease/facts.htm.

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

Dillworth, J., Dickson, V., Reyentovich, A., & Shedlin, M. (2018). Patient decision-making regarding left ventricular assist devices: A multiple case study. *Intensive & Critical Care Nursing.*

Heart Failure Society of America (2019). Learn about heart failure: Heart failure facts and information. Retrieved from https://www.hfsa.org/patient/learn/.

Iacovetto, M., Matlock, D., McIlvennan, C., Thompson, J., Bradley, W., LaRue S., & Allen, L. (2014). Educational resources for patients considering a left ventricular assist device: A cross-sectional review of internet, print, and multimedia materials. *Circulation: Cardiovascular Quality and Outcomes, 7(6),* 905-911.

Kitko, L., Hupcey, J., Birriel, B., & Alonso, W. (2016). Patients' decision making process and expectations of a left ventricular assist device pre and post implantation. *Heart & Lung: The Journal of Acute and Critical Care, 45(3),* 293-294.

Koelling, T., Johnson, M., Cody, R., & Aaronson, K. (2005). Discharge education improves clinical outcomes in patients with chronic heart failure. *Circulation, 111(2),* 179-185.

Kostick, K., Bruce, C., Minard, C., Volk, R., Civitello, A., Krim, S., Horstmanshof, D., Thohan, V., Loebe, M., Hanna, M., Bruckner, B., Barby, B., & Estep, J. (2018). A multisite randomized controlled trial of a patient-centered ventricular assist device decision aid (VADDA Trial). *Journal of Cardiac Failure, 24(10),* 661-671.

Metzger, M., Song, M., Ward, S., Chang, P., Hanson, L., & Lin, F. (2016). A randomized controlled pilot trial to improve advance care planning for LVAD patients and their surrogates. *Heart and Lung, 45(2016),* 186-192.

Metzger, M., Song, M., & Devane-Johnson, S. (2016). LVAD patients' and surrogates perspectives on SPIRIT-HF: An advance care planning discussion. *Heart and Lung, 45(2016),* 305-310.

Pedersen, S., Van Domburg, R., Theuns, D., Jordaens, L., & Erdman, R. (2005). Concerns about the implantable cardioverter defibrillator: A determinant of anxiety and depressive symptoms independent of experienced shocks. *American Heart Journal, 149(4),* 664-669.

Prinzing, A., Herold, U., Berkefeld, A., Krane, M., Lange, R., & Voss, B. (2016). Left Ventricular assist devices—current state and perspectives. *Journal of Thoracic Disease, 8(8).* Doi:10.21037/jtd.2016.07.13

Stehlik, J., Estep, J., Selzman, C., Rogers, J., Spertus, J., Shah, K., Chuang, J., Farrar, D., Starling, R., & ROADMAP Study Investigators (2017). Patient-reported health-related quality of life is a predictor of outcomes in ambulatory heart failure patients treated with left ventricular assist device compared with medical management: Results from the ROADMAP study (risk assessment and comparative effectiveness of left ventricular assist device and medical management. *Circulation Heart Failure, 10(6).*

Thylén, I., Moser, D., Strömberg, A., Dekker, R., & Chung, M. (2016). Concerns about implantable cardioverter-defibrillator shocks mediate the relationship between actual shocks and psychological distress. *Europace, 18(6),* 828-835.

Thompson, J., Matlock, D., McIlvennan, C., Jenkins, A., & Allen, L. (2015) Development of a decision aid for patients with advanced heart failure considering a destination therapy left ventricular assist device. *JACC: Heart Failure, 3(12),* 965-976.

U.S. Department of Health and Human Services (n.d.) Organ Procurement and Transplantation Network National Data.

Verdoorn, B., Luckhardt, A., Wordingham, S., Dunlay, S., & Swetz, K. (2017). Palliative medicine and preparedness planning for patients receiving left ventricular assist device as destination therapy: Challenges to measuring impact and change in institutional culture. *Journal of Pain and Symptom Management, 54(2),* 231-236.

**Table 1.** *Demographic Data*

| *Demographic Data* | |
|---|---|
| | Full Sample (N=30) |
| Age (years) | 57 (16) |
| Sex: male, n(%) | 23 (76.7) |
| Race n(%) | |
| White | 27 (90) |
| Black or other minority | 3 (10) |
| Marital status | |
| Single | 7 (23.3) |
| Married | 15 (50) |
| Divorced/Separated/Widowed | 8 (26.7) |
| NYHA classification, n(%)(n=29) | |
| III | 8 (26.7) |
| IV | 21(70) |
| Intermacs Profile, n(%) | |
| 1 | 4 (13.3) |
| 2 | 6 (20) |
| 3 | 17 (56.7) |
| 4 | 2 (6.7) |
| Indication, n(%) | |
| Destination Therapy | 19 (63.3) |
| Bridge to Transplant | 11 (36.7) |
| ICD Therapy (yes), n(%) (n=29) | 25 (83.3) |
| Days with LVAD Therapy | 702 (589) |
| Range of LVAF Therapy (in days) | 34 - 2472 |
| Pump Exchange (yes), n(%) (n=29) | 3 (10) |
| EuroQOL total score | 8 (2) |
| MoCa total score(n=29) | 23 (4) |
| Newest Vital Sign total score (n=28) | 2 (2) |
| MPSS total score (n=29) | 72 (17) |
| CAS-R total score | 30 (6) |
| LVAD Concerns total score | 22 (14) |
| PHQ-9 total score | 7 (5) |
| BSI Anxiety Subscale total score (n=29) | 4 (5) |
| IDAS total score | 64 (8) |
| *Legend:* Data are shown as mean (SD), except as noted. NYHA- New York Hospital Association Class, ICD- Implantable cardioverter defibrillator, LVAD- left ventricular assist device, EuroQOL- European quality of life measurement, MoCa- Montreal cognitive assessment, MPSS- multidimensional perceived social support, CAS-R- Control attitudes scale revised, PHQ-9- Patient health questionnaire-9, BSI- Brief symptom inventory, IDAS- Implanted device adjustment scale. | |

**Table 2.** *Comparison of Concerns Pre- and Post-Video Implementation*

| *Comparison of Concerns Pre- and Post-Video Implementation* | | |
|---|---|---|
| | **Sample** | **Total Scores (Mean ± SD)** |
| **Pre-Video** | N=30 | 22 ± 14 |
| **Post-Video** | N=29 | 17 ± 13 |
| P-value overall = 0.002 | | |

**Table 3.** *Comparison of Concerns Pre- and Post-Video Implementation by Question*

| *Comparison of Concerns Pre- and Post-Video Implementation by Question* | | | |
|---|---|---|---|
| | **Pre-Video** | **Post-Video** | **P-Value** |
| **Q1: Battery Dying** | 1.43 ± 1.28 | 0.86 ± 1.06 | 0.032 |
| **Q2: LVAD abruptly stops working** | 2.07 ± 1.51 | 1.45 ± 1.27 | 0.007 |
| **Q3: Alarms going off, not knowing how to respond** | 1.43 ± 1.50 | 0.90 ± 1.08 | 0.058 |
| **Q4: Exercise causing LVAD malfunction** | 0.83 ± 0.99 | 0.86 ± 1.30 | 0.954 |
| **Q5: Activities/hobbies causing LVAD malfunction** | 1.03 ± 1.25 | 1.00 ± 1.31 | 0.793 |
| **Q6: Heart condition getting worse** | 1.67 ± 1.35 | 1.41 ± 1.27 | 0.294 |
| **Q7: Not being able to do things I love** | 1.80 ± 1.32 | 1.62 ± 1.29 | 0.632 |
| **Q8: Traveling** | 1.57 ± 1.36 | 0.76 ± 0.99 | 0.001 |
| **Q9: Working too hard causing LVAD malfunction** | 1.40 ± 1.30 | 0.79 ± 1.11 | 0.011 |
| **Q10: Making love causing LVAD malfunction** | 1.20 ± 1.45 | 0.66 ± 1.11 | 0.010 |
| **Q11: Having no warning LVAD will malfunction** | 2.00 ± 1.66 | 1.14 ± 1.33 | 0.009 |
| **Q12: Symptoms/pain associated with LVAD** | 0.90 ± 0.92 | 0.72 ± 0.88 | 0.330 |
| **Q13: Being a burden to family** | 2.07 ± 1.46 | 1.69 ± 1.37 | 0.083 |
| **Q14: Not being able to work/take part in activities/hobbies** | 1.57 ± 1.38 | 1.38 ± 1.21 | 0.327 |
| **Q15: The future** | 1.27 ± 1.41 | 1.28 ± 1.28 | 1.000 |

**Figure 1.** *LVAD Concerns Scale*

| *LVAD Concerns Scale* | | | | | |
|---|---|---|---|---|---|
| I am worried about: | **0 Not concerned at all** | **1 A little bit concerned** | **2 Somewhat concerned** | **3 Quite a bit concerned** | **4 Very concerned** |
| **My LVAD battery dying** | | | | | |
| **My LVAD abruptly stops working** | | | | | |
| **My LVAD alarms going off and not knowing how to respond** | | | | | |
| **Doing exercise in case it causes my LVAD to malfunction** | | | | | |
| **Doing activities/hobbies that may cause my LVAD to malfunction** | | | | | |
| **My heart condition getting worse and the LVAD not being enough to support my heart** | | | | | |
| **Not being able to do the things I love because of LVAD related concerns** | | | | | |
| **Traveling with my LVAD** | | | | | |
| **Working too hard/overdoing things causing my LVAD to malfunction** | | | | | |
| **Making love in case my LVAD malfunctions** | | | | | |
| **Having no warning my LVAD will malfunction** | | | | | |
| **The symptoms/pain associated with my LVAD** | | | | | |
| **Being a burden to my partner/family** | | | | | |
| **Not being able to work/take part in activities and hobbies because I have an LVAD** | | | | | |
| **The future now that I have an LVAD** | | | | | |