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# Heart Failure Zone Tool: A Quality Improvement Project

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**DOCTOR OF NURSING PRACTICE (DNP)**

# HEART FAILURE ZONE TOOL: A QUALITY IMPROVEMENT PROJECT

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## Abstract

### Purpose

Heart failure is the leading cause of hospital admissions among adults over 65 years old and lack of patient knowledge regarding the self-management of heart failure is a key factor in rising readmission rates. This project enhances inpatient heart failure education using a laminated heart failure zone tool handout to guide heart failure education. The intent was to increase patients' confidence regarding heart failure self-management and positively impact patients' knowledge regarding the management of heart failure.

### Materials and Methods

The process included identifying hospitalized patients who had been flagged as a heart failure core measure or had been identified by the heart failure coordinators as needing heart failure education. The DNP research team analyzed two main outcomes: patient confidence in self-managing heart failure and patient knowledge about heart failure. Patients completed two pre-test assessments to evaluate their baseline heart failure knowledge and confidence in self-managing heart failure. The Nebraska Medicine Confidence Survey (NMCS) was used to assess their confidence while knowledge was tested using the Patient Knowledge Questionnaire (PKQ). Specialized education was provided, emphasizing the heart failure zone tool to help patients identify commonly reported symptoms and steps for managing those symptoms. After receiving the specialized education, patients completed a post-test to reassess any changes to their heart failure knowledge and confidence. The intent was that the specialized heart failure education would increase patients' reported confidence in managing heart failure and patients' knowledge about heart failure.

### Results

The process included identifying hospitalized patients who had been flagged as a heart failure core measure or had been identified by the heart failure coordinators as needing heart failure education. The DNP research team analyzed two main outcomes: patient confidence in self-managing heart failure and patient knowledge about heart failure. Patients completed two pre-test assessments to evaluate their baseline heart failure knowledge and confidence in self-managing heart failure. The Nebraska Medicine Confidence Survey (NMCS) was used to assess their confidence while knowledge was tested using the Patient Knowledge Questionnaire (PKQ). Specialized education was provided, emphasizing the heart failure zone tool to help patients identify commonly reported symptoms and steps for managing those symptoms. After receiving the specialized education, patients completed a post-test to reassess any changes to their heart failure knowledge and confidence. The intent was that the specialized heart failure education would increase patients' reported confidence in managing heart failure and patients' knowledge about heart failure.

### Conclusions

The findings suggest clinical significance because the education provided positively impacted patients' self-management confidence and heart failure knowledge. The heart failure zone tool clearly indicates which symptoms require contacting their physician for further guidance and "red flag" symptoms that require contacting emergency services. The outcomes of this DNP project suggest that utilizing the heart failure zone tool will be advantageous for improving patients' health.

## Introduction

In the United States, 6.2 million people are living with heart failure (Centers for Disease Control and Prevention, 2022). By 2030, the prevalence of heart failure is expected to increase by 24%, resulting in higher cost of treatment (Urbich, Globe, Pantiri, Heisen, Bennison, Wirtz, & Di Tanna, 2020). This disease has created both personal and societal burdens on daily lives. Lack of self-management and medical adherence are at the forefront of the problem. Readmission rates have been linked to issues with medication nonadherence, lifestyle modifications, dietary changes, and symptom management (Reilly, Higgins, Smith, Gary, Robinson, Clark, McCarty, & Dunbar, 2020). Research has shown that a lack of patient knowledge regarding the self-management of heart failure is a key factor in rising readmission rates (Reilly et al., 2020). Heart failure self-management skills include medication adherence, low sodium diet, and symptom monitoring (Reilly et al., 2020).

Inadequate symptom recognition, lack of understanding of diseases processes, inappropriate decisions to manage symptoms, and lack of timely follow-up with a healthcare provider have all been linked to hospital readmissions (Awoke, Baptiste, Davidson, Roberts, & Dennison- Himmelfarb, 2019). Despite an improved understanding of what would improve heart failure morbidity and burden, few interventions have been found to improve patient medication adherence, reinforce self-management and self-care, and consistently show reduction of inpatient readmissions (Anderson, Awoke, Barish, Asano, & Yearwood, 2021). Heart failure is the most common cause of hospital readmissions with nearly 24% of those readmitted within 30 days and 30% of heart failure patients readmitted within 60 to 90 days (Awoke et al., 2019).

The cost of treatment for heart failure patients in the United States is estimated at $32 billion per year, including lost wages and productivity (Awoke et al., 2019). The annual cost of treatment is expected to rise to $69.7 billion by 2030 if no further action is taken to decrease the burden of heart failure (Urbich et al., 2020). With this enormous financial burden not only for patients and their families but also health care systems, it is essential to find a solution. Heart failure-specific hospitalizations are the largest

expense for patients with heart failure, attributing to 70% of the annual cost of treatment (Urbich et al., 2020).

The purpose of this project was to enhance inpatient heart failure education prior to discharge. The focal point of this project was the use of a laminated heart failure zone tool handout to guide heart failure education. The intent was to increase patient confidence regarding heart failure self-management, and positively impact patient knowledge regarding the management of heart failure. Descriptive statistics were used to describe 30-day readmission rates.

## Problem Statement

Heart failure is the leading cause of hospital admissions for patients aged 65 years and older, and readmission rates are as high as 23% (Rethy, McCabe, Pool, Vu, Kershaw, Yancy, Vupputuri, Feinglass, & Khan, 2020). This disease costs the United States an estimated $30.7 billion per year (Centers for Disease Control and Prevention, 2022). Despite years of research to decrease hospital readmissions related to heart failure, the readmission rates have steadily increased from 2001 to 2009 (Al-Tamimi et al., 2021). Lack of knowledge about a disease process, inability to recognize and treat symptoms, and absence of prompt follow-up with a health care provider are common factors that contribute to hospital readmissions (Awoke et al., 2019).

Previous efforts have focused on educating patients about heart failure knowledge; however, current research shows that it is crucial to focus education on factors that may increase self-management skills and patient confidence in leading their own care (Reilly et al., 2020). It is imperative to assess the level of knowledge of patients with heart failure, as the level of knowledge is positively correlated with a person's ability to recognize and self-manage symptoms (Awoke et al., 2019). An initial knowledge and self-care assessment prior to education assists nurses in providing the appropriate education needed for heart failure management (Awoke et al., 2019).

## Clinical Research Question

The clinical research question for this project proposal was: In hospitalized patients with heart failure, did the inclusion of specialized heart failure zone education result in patients reporting increased confidence and increased knowledge of heart failure self-management?

## Purpose Statement

The DNP students conducted a quality improvement (QI) project of the specialized heart failure zone education for hospitalized patients with heart failure at a Midwestern hospital in the United States. Outcomes measured were confidence and heart failure knowledge.

## Aims

The aims of this QI project regarding specialized heart failure zone education for hospitalized patients with heart failure were to:

1. Describe the relationship between confidence and heart failure knowledge for hospitalized patients with heart failure who received the specialized heart failure zone education.
2. Compare heart failure confidence scores and heart failure knowledge scores before the implementation of the specialized heart failure zone education to their confidence scores and heart failure knowledge scores 1 to 2 hours after the implementation of the specialized heart failure zone education.
3. Describe the relationships among confidence, heart failure knowledge, and demographics for hospitalized patients with heart failure who received the specialized heart failure zone education.
4. Describe the study population using demographic information. Description included 30-day readmission rates during the intervention period.
5. Evaluate the usability and feasibility of the specialized heart failure zone education program for hospitalized patients with heart failure.

## Review of Literature

The review of the literature contained articles that discussed the heart failure zone tool with patients who reported on their perceptions of the tool (Anderson et al., 2021; Weiss, Robertson, & Goebel, 2019), discussed how patient knowledge impacted their ability to recognize symptoms and seek further interventions (Awoke et al., 2019; Biddle, Moser, Pelter, Robinson, & Dracup, 2019; Okada, Tsuchihashi-Makaya, Kang, Aoki, Fukawa & Matsuoka, 2019; Zeng, Chia, Chan, Tan, Low, & Fong, 2019), examined factors that influenced confidence in self-managing heart failure (Awoke et al., 2019; Mathew & Thukha, 2018; Morley & Levin, 2021; Okada et al., 2019), and finally reported on what factors may have increased or decreased readmission to the hospital (Awoke et al., 2019; Mathew & Thukha, 2018; Rice, Say, & Betihavas, 2017; Sevilla-Cazes, Ahmad, Bowles, Jaskowiak, Gallagher, Goldberg, Kangovi, Alexander, Riegel, Barg, & Kimmel, 2018).

### Heart Failure Zone Tool

In a study by Weiss et al. (2019), participants were interviewed on their interpretation of a heart failure zone tool. Specifically, interviews included questions about personal opinions of the tool and impressions of how well the tool helps to recognize the signs and symptoms of heart failure. Participants commented that the zone tool was “very helpful” and reported increased awareness of their heart failure signs and symptoms when using the tool alongside a self-monitoring log (Weiss et al., 2019). Another study similarly focused on the opinions of participants when utilizing a heart failure zone tool for self-management of heart failure (Anderson et al., 2021). Participants reported mostly positive responses about the heart failure zone tool and stated the zone tool helped guide them on what steps they should take if they had certain symptoms, as well gave them an overall sense of heart failure status (Anderson et al., 2021).

Although both articles produced mostly positive feedback, there were some observations that were not as favorable (Anderson et al., 2021; Weiss et al., 2019). Participants found the format of the tool was tedious and cumbersome while documenting their heart failure symptoms (Weiss et al., 2019). Nurses who were assisting other patients of the same study said the zone tool’s readability was

"somewhat hard to understand", which could deter individuals in utilizing it for managing their condition (Weiss et al., 2019). Commentary from participants in Anderson et al. (2021) were more positive, with most responses favorable and small, such as asking for a "wallet-sized" tool or "larger font options". One participant was not accepting of the tool due to being in-denial of his diagnosis, which may mean that he needed more time, or education about heart failure's chronicity (Anderson et al., 2021). Overall, both articles showed mostly positive responses, which helped affirm the effectiveness of the heart failure zone tool in self-management of symptoms for patients.

**Knowledge and Symptom Recognition**

Health knowledge is a monumental part of heart failure self-maintenance. Awoke et al. (2019) reported a positive correlation between a patients' level of knowledge about heart failure and their ability to self-manage and care for their symptoms as they occur. Biddle et al. (2019) also discussed how self-care was greatly improved by increased knowledge and symptom recognition and stated patients who recognized symptoms earlier and were able to distinguish serious symptoms versus those as non-critical were more likely to self-adhere as they had more perception of control and less anxiety. Zeng et al. (2019) reported the level of heart failure knowledge was significantly related to patients' adherence to the care regimen and treatment. When patients answered heart failure questions based on current or previous heart failure education, researchers found that patients would often be less compliant with a plan of care if they did not understand the reasoning (Zeek et al., 2019). Patients delayed seeking care, took medications that were not indicated for heart failure, and did not know they were having a heart failure exacerbation due to lack of knowledge (Okada et al., 2019).

All four articles related the importance of knowledge and perception as important factors for patients with heart failure (Awoke et al., 2019; Biddle et al., 2019; Okada et al., 2019; Zeng et al., 2019). Health literacy and awareness of symptoms is an enormous challenge of living with heart failure but is also essential for survival and self-maintenance. It was imperative to ensure patients understood the course of disease, medications and what they are for, as well as the plan of care for self-maintenance and

reinforce a better quality of life. Because excellent education was a key piece to ensuring plan of care adherence, it was one of the first interventions addressed in heart failure management.

**Confidence in Self-Management**

Heart failure disease management is a colossal task, and Morley and Levin (2021) discussed studying patient health literacy by examining patient confidence levels in heart failure health outcomes. They asked questions about how confident patients feel they can manage their disease, recognize symptoms, and how confident they could manage and control most of their problems (Morley & Levin, 2021). Participants reported average confidence scores of 6.71 prior to education administered by researchers compared to average scores of 8.74 postintervention (Morley & Levin, 2021). In a similar study, Okada et al. (2019) discussed symptom perception and stated if patients perceived their symptoms were out of their control, they would be less confident in managing their symptoms. Mathew and Thukha (2018) reviewed the importance of using nurse-guided education and found that this method of educating patients had shown an increase in patient confidence in heart failure self-management. Awoke et al. (2019) recorded patient's self-care maintenance and self-care confidence scores using the Self-Care Heart Failure Index Score at baseline and at 30-day follow up and found after nurse-led teach-back education, there was a statistically significant difference in self-care confidence scores.

Heart failure self-management is deeply rooted within confidence and increasing health literacy has been mentioned within each article (Awoke et al., 2019; Mathew & Thukha, 2018; Morley & Levin, 2021; Okada et al., 2019). These findings matched themes associated with the Theory of Self-Efficacy by Albert Bandura that states a person's belief in their ability to complete a task or goal is influenced by the confidence they have in their own ability to manage a task or problem (Bandura & Adams, 1977). Self-efficacy is also affected by experience, knowledge, and emotional state, which is why ensuring that patients are informed and reaffirmed on their ability to self-manage their heart failure is essential to ensure maximum confidence. By boosting patients' confidence, using nurse-led education, and teaching about symptom recognition, patients believed they had a greater ability to self-care and self-manage their condition at home.

**30-Day Readmissions**

Mathew and Thukha (2018) examined what types of education would be most effective in reduction of heart failure hospital readmission. As stated earlier, nurse-guided patient education provided knowledge retention and increased confidence in patients, which in turn reduced the number of patients in the study who were readmitted to the hospital (Mathew & Thukha, 2018). In a systematic review, Rice et al. (2018) reaffirmed nurse-led education reducing hospital readmissions and concluded that there was a 50% reduction in one study in heart failure related readmissions following education. Lack of knowledge, inability to recognize symptoms, and mismanaging treatment were more commonly associated with healthcare readmissions (Awoke et al., 2019). When patients were interviewed, they stated "I didn't want to be a burden" when needing to seek medical advice or "I didn't feel immediate effects" after following diet recommendations, which eventually led to readmission of these individuals (Sevilla-Cazes et al., 2018). Sevilla et al. (2018) also discussed other factors contributing to readmissions including multiple comorbidities and not viewing readmission as a "negative" outcome.

Themes common among these articles in reference to hospital readmission focused on increased awareness of patient's personal needs of topic areas of education and focusing on nurse-led education (Awoke et al., 2019; Mathew & Thukha, 2018; Rice et al., 2018; Sevilla et al,2018). Some patients could have responded more favorably to knowledge topics whereas others might have responded better if education were tailored more to what the patient should and should not do. The nurse, through interview, may have ultimately determined which was the best method of education to provide for them. It may have been necessary to examine the views of each patient on readmission and educate them on more effective ways to manage their condition prior to seeking admission.

## Conceptual/Theoretical Framework

The theoretical framework selected for this DNP research project was the Donabedian Model of Structure, Process, and outcome commonly used to analyze health care quality (Donabedian, 2005). Structure was defined as the institutions, facilities, and equipment used. It could have also included the qualifications of the medical staff (Donabedian, 2005). Process referred to the various methods for collecting clinical data, such as reviewing medical records and direct observation (Donabedian, 2005). Lastly, outcomes referred to the event of interest, for example, 30-day readmission rates for heart failure patients, patient confidence, and patient knowledge regarding heart failure self-management.

### Structure

The structure for this project included Nebraska Medicine as the selected institution. Equipment for this project included laminated patient handouts with the heart failure zone tool.

### Process

The process for this project included identifying hospitalized patients who had been flagged as a heart failure core measure or had been identified by the heart failure coordinators as needing heart failure education (see Methods for more details). Patients hospitalized for heart transplants, left ventricular assist devices (LVADs), or were receiving inotropes were excluded. The DNP research team provided the selected patients with specialized heart failure education that emphasized the Nebraska Medicine heart failure zone tool. Participants were asked to complete a pre-test to assess the patients' baseline heart failure knowledge. After receiving the specialized education, patients were asked to complete a post-test to reassess their heart failure knowledge and a confidence survey.

### Outcome

The DNP research team analyzed two main outcomes: patient confidence and patient knowledge. We used the Nebraska Medicine Confidence Survey (NMCS) to assess patient confidence and the Patient Knowledge Questionnaire (PKQ) to assess patient knowledge. Thirty-day readmission rates were used to

describe the study population and were determined using current practice at Nebraska Medicine. The intent is the specialized heart failure education will increase patient confidence and patient knowledge.

## Methodology

### Design

This QI project included the DNP research team, the Heart Failure Disease Management Program Coordinator (HFDMPC), and patients hospitalized with heart failure. Heart failure patients were identified using a heart failure core measure flag in Epic when their ejection fraction (EF) was less than or equal to 40% or when heart failure was listed on the hospital problem list or when mentioned in provider documentation. Previously, the HFDMPC had provided heart failure management education to all patients flagged with the heart failure core measure using a booklet developed by Nebraska Medicine that contained the heart failure zone tool. This QI project had aimed to improve the current practice by making the heart failure zone tool a laminated handout, separate from the booklet. By separating the zone tool from the booklet and laminating it, the DNP research team had hoped to increase utilization and therefore positively impact patient confidence, and patient knowledge. The DNP research team used the laminated handout to guide their specialized heart failure education.

The HFDMPC helped identify possible study participants by entering patient initials, date of birth, and hospital room number on an Excel spreadsheet housed in a secure Microsoft Teams group shared by stakeholders, advisors, and the DNP student research team. The HFDMPC would then notify the DNP research team via a text message that possible study participants had been added to the Excel spreadsheet. No additional details would be given via text message. This method of communication ensured patient confidentiality and Health Insurance Portability and Accountability (HIPAA) compliance. Once the DNP research team had received notification of possible study participants, DNP students would make every effort to meet face to face with the identified individuals to provide them with specialized heart failure education prior to their discharge. Study participants would receive the laminated handout and a standard, yet personalized, educational talk regarding the management of heart failure.

This QI project took place during a 4-month intervention period from **October 2023 to January 2024**. The DNP research team administered the NMCS to all participants prior to giving the specialized heart failure education and administered the NMCS again, 1 to 2 hours after they received the specialized heart failure education. The results of the NMCS that was administered prior to the specialized heart failure education were compared to the results of the NMCS that was administered after the specialized heart failure education. The research team had hoped to see an increase in patient confidence after the specialized heart failure education.

To assess patient knowledge regarding heart failure self-management, the DNP research team administered the PKQ twice, once before the patient had received the specialized heart failure education and again 1 to 2 hours after the patient had received the specialized heart failure education. The research team had hoped to see an increase in knowledge after patients had received specialized heart failure education.

To discuss 30-day readmission rates for heart failure patients at Nebraska Medicine, the DNP research team used Vizient, the current practice at Nebraska Medicine, which was provided to the research team by the HFDMPC.

## Intervention

### *Patient Handout*

Selected participants received specialized heart failure education on behalf of the DNP research team. Participants were given a laminated handout with the heart failure zone tool printed on the front and instructions for identifying small personal victories printed on the back. Please see Appendix A for a copy of the handout. Participants were able to personalize their handout by writing their name at the top. The laminated nature of the handout made it resistant to spills and increased its longevity. The handout could be placed on the refrigerator door, nightstand, or wherever it was easily accessible to the participants, increasing the likelihood of use. Previously, the heart failure zone tool was only on page 19 of the heart

failure education booklet. Additionally, participants could use a dry-erase marker to directly write on the handout to select the zone with which they self-identified.

### *Specialized Heart Failure Education*

Once an interested participant was identified, a member of the DNP research team introduced herself to the patient and completed the necessary consent form. The members of the research team then provided educational communication which would include discussing the importance of daily weights, adhering to their medication regimen, following dietary recommendations, and prioritizing hospital follow-up appointments. Members of the DNP research team reiterated that following these recommendations could help prevent hospitalizations. Participants were encouraged to ask questions throughout the educational communication session. The DNP research team discussed with each participant the importance of understanding their baseline symptoms to help them identify heart failure exacerbations early on.

Additionally, patients received details regarding the definition of each heart failure zone. The green zone was the safe zone. It meant that patients did not have shortness of breath, had not gained more than 3 pounds overnight or 5 pounds over their dry weight, and they were not experiencing any chest pain or changes in their swelling. Patients who self-identified with this zone were instructed to keep up the good work and continue to follow a low-salt diet, take their medications, and weigh themselves daily. The yellow zone was the caution zone. Patients would find themselves in the yellow zone if they were having difficulty breathing while lying flat and were therefore sleeping in a chair. Patients in this zone also experienced more shortness of breath, swelling, or were feeling more tired. Dizziness also may have been a symptom. Patients who self-identified with this zone would be instructed to contact their physician. The red zone was the danger zone. Patients who were struggling to breathe while at rest, having chest pain, or feeling faint or cannot think clearly, were instructed to call 911 immediately.

## Participants

Participants included hospitalized adult patients at Nebraska Medicine who were flagged with the heart failure core measure in the Epic electronic health record or were identified by the heart failure coordinator team as needing specialized heart failure education. Possible study participants were 19 years or older and English-speaking patients. Patients with heart transplants, left ventricular assistance devices (LVAD), or those receiving inotropic therapy were excluded from our study. When reviewing Nebraska Medicine's first quarter of 2023, there were on average 65 to 70 heart failure admissions per month. Of these, 55 patients per month met our inclusion criteria. For the aims of comparing pre-intervention data to post-intervention data regarding knowledge and confidence with a paired *t*-test, a statistical power analysis was performed for sample size estimation with G*Power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007), using a $d = 0.5$, an alpha = .05, and power = 0.80, the total sample size needed was 34. The DNP team planned to enroll patients up to our estimated 55 patients to account for attrition due to withdrawal or interruption from nursing or medial cares. Once patients were identified as potential study participants, a member from the DNP research team introduced the study to the patients to determine if they are interested in participating. Interested patients were then consented.

## Setting

This study was conducted at Nebraska Medicine in Omaha, Nebraska. The study included all non-intensive care units in the Lied Transplant Center, Clarkson Tower, and University Tower. Patients admitted to the Fred & Pamela Buffet Cancer Center were excluded.

## Tools/Measures

### *Nebraska Medicine Confidence Survey*

The NMCS was a 7–item questionnaire used to evaluate a patient's readiness for self–care at home. This survey could be self-administered. The first three questions assessed a patient's confidence regarding their ability to follow dietary recommendations, medication regimen, and recommended physical activity. Questions 3 through 6 assessed a patient's confidence related to recording their weight daily, knowing when to contact their physician based on their symptoms, and attending follow-up

appointments. Patient responses were recorded on a 1 to 4 Likert scale, 1 (I am not confident at all), 2 (I am somewhat confident), 3 (I am mostly confident), 4 (I am totally confident). The last question asked patients if they felt they were given adequate information to manage their heart failure at home; patients could respond yes or no. This survey was developed by our stakeholders and was currently used to assess patient confidence prior to discharge. The reliability and validity had not been established. See Appendix B for a copy of the NMCS.

### *Patient Knowledge Questionnaire*

The PKQ was a 10 –item self-administered questionnaire used to assess non-pharmacological management of heart failure (Lainscak & Keber, 2005). Questions 1 through 3 assessed the patient's knowledge regarding their basic clinical condition. Questions 4 through 9 assessed the patient's knowledge regarding dietary and fluid restrictions. (Lainscak & Keber, 2005). The last question asked patients if they checked their blood pressure at home. Patients responded yes or no to all questions. Responding yes correlated to 1 point leading to a possible maximum score of 10 and possible minimum score of 0 (Lainscak & Keber, 2005). In a study with 42 participants, the internal validity of the PKQ, determined by the Cronbach alpha, was 0.74 (Lainscak & Keber, 2005). See Appendix C for a copy of the PKQ.

### *Demographic Information Tool*

To collect and organize data the research team utilized an Excel spreadsheet housed in a secure Microsoft Teams webpage. Patient names would not be recorded in the Demographic Information Tool; only Assigned Patient Identification Numbers would be listed to ensure patient confidentiality. This strategy would ensure patient confidentiality. Information housed in the data collection tool would include select patient demographics detailed in Data Collection section and individual NMCS and PKQ survey results. Demographic information of interest included age, gender, patient education level, EF, New York Heart Association (NYHA) Classification, day of hospital stay, and nurse time spent on education. See Appendix D for a copy of the Demographic Information Interview Guide.

### Data Collection

Data collection for this study had primarily been performed through survey results. During the intervention period, the DNP research team collected participant data with guidance from the HFDMPC. This individual entered patient initials, date of birth, and hospital room number in an Excel spreadsheet contained in a secure site, Microsoft Teams. The Microsoft Teams group was only accessible to stakeholders, advisors, and the DNP student research team. The HFDMPC then notified the DNP research team via text message that possible study participants have been added to the Excel spreadsheet. The DNP research team was then responsible for meeting with the identified patients face to face to determine if they were interested in participating in the study and provide specialized heart failure education if the patient chose to participate. Using a separate Excel spreadsheet as a data collection tool, the DNP research team collected patient demographic information directly from the patient. Demographic information of interest included age, gender, patient education level, EF, New York Heart Association (NYHA) Classification, day of hospital stay, and nurse time spent on education. The DNP research team also recorded the results of each participant's confidence and knowledge survey on the data collection tool.

### Institutional Review Board

Members of the DNP research team gained approval from the Institutional Review Board (IRB) for this QI project.

## Analysis

The two main outcomes of interest for this DNP project included patient confidence levels and patient knowledge regarding heart failure. Patient confidence had been determined using test scores from the NMCS. Descriptive statistics such as frequencies, measures of central tendency and variance were used to summarize demographic and outcome data. For the aim of comparing pre-intervention data to post-intervention data regarding knowledge and confidence a paired *t*-test was used. For the aim of describing the relationship between confidence and heart failure knowledge, a Pearson correlation was

used. Describing the relationships among confidence, heart failure knowledge, and demographics had been assessed with correlational and chi-square methods, as appropriate.

To assess the effectiveness of the heart failure zone tool on patient knowledge, the DNP research team utilized the PKQ. The PKQ measured patient knowledge regarding heart failure (Lainscak & Keber, 2005).

## Findings

Data for this project was collected from late October to early January 2024 until a sample size of 34 was obtained. Demographic information for all study participants was obtained through patient interviews. Fifty-six percent of the participants were female (n=19), and 44% were male (n=14). The youngest participant was 42 years old, and the oldest was 87 years old. The average age of the participants was 65 years old, with a median age of 64.5. Reported educational levels ranged from having less than a high school diploma to a graduate-level degree. Additionally, 11 participants reported having an associate degree. Lastly, the time spent providing face-to-face specialized education ranged from five to 39 minutes. The average time spent on specialized education was 13.9, with a median of 14 minutes.

A Pearson Correlation was used to assess the relationship between heart failure, self-management confidence and heart failure knowledge among study participants. A positive correlation of $r(34) = 0.475$, $p < 0.01$, was found between the two variables. The scores of the confidence and knowledge surveys were compared before and after participants received the specialized education. The mean score of the knowledge questionnaire before receiving the education was 7.29 (SD 1.83). The mean score of the knowledge questionnaire after the education was 7.99 (SD 1.75). The mean scores on the confidence questionnaire before and after education were 20.85 (SD 2.64) and 22.12 (SD 2.78), respectively. A paired samples t-test was conducted to compare the pre- and post-scores for both questionnaires. A significant difference was found between the pre- and post-scores for the confidence survey, $t(33)=4.028$, $p <.001$, $d=0.69$, and the knowledge survey $t(33)=2.713$, $p = .010$, $d=0. 47$.

The relationship between confidence, heart failure knowledge, and the participants' demographics was analyzed using a Pearson Correlation. A positive correlation of $r(34) = 0.351$, $p<0.042$, was found between the age of the participants and their associated change in confidence. Lastly, no difference was found between men and women and their respective changes in scores for either survey.

## Discussion

For heart failure patients, having adequate knowledge and recognition of the disease process largely affects the patient's ability to manage symptoms (Awoke et al., 2019). Education about the heart failure process and giving tools for symptom management is one of the easiest ways to assist patients to be successful with self-management. According to Awoke et al. (2019), nurse-led heart failure education often increased knowledge, promoted positive self-care behaviors, and in some instances led to a reduction in readmissions. Providing tools and information in addition to current education guidelines can positively impact patient outcomes and well-being.

This study evaluated the impact of the heart failure zone tool on patient's self-confidence and knowledge about heart failure management. A limitation of this study is that mean substitution was used sparingly. The sample size included an almost even number of females to males. Participants' ages ranged from 42 years old to 87 years old. Education levels among participants varied significantly, some had less than high school diploma and others had a graduate-level education. However, there was no correlation between participants' level of education and their change in post education scores. A positive correlation was found between heart failure education, self-management confidence, and heart failure knowledge. This has clinical significance as it suggests that the education provided positively impacted a patient's self-management confidence and heart failure knowledge.

In similar studies examining the use of zone-tool materials for heart failure education, positive feedback was often received from patients. Weiss, Robertson, and Goebel (2019) reported that the zone tool increased patients' awareness of their heart failure health and assisted them with managing any signs and symptoms they may be having. In another study by Anderson et al. (2021), patients who received a heart failure action plan reported increased confidence in their knowledge about heart failure and

responded positively to their ability to personally manage their health status. When provided with readily available tools with easy-to-read instructions, patients are armed with increased knowledge leading to confidence in their ability to manage symptoms. Patients may also report improved health care outcomes and quality of life, as they are better equipped with self-care confidence. Providing simple tools for heart failure management ensures patients are well-equipped for effective self-care when living with heart failure.

## Conclusions

Patient education has been found to be one of the most important methods to help patients be successful with heart failure self-management. The heart failure zone tool provides a quick and easy reference for patients to self-reflect on their current symptoms and provides them with action steps based on their symptoms. Patients reported an increase in confidence in self-management of heart failure and increased knowledge of heart failure when they received education using the zone tool. Equipping patients with tools for heart failure management is important for enhancing their quality of life and health.

## Significance

When examining the literature, tailoring education has been addressed as imperative to ensure patients have the knowledge needed to manage their symptoms and reduce readmissions to the hospital (Awoke et al., 2019). Increasing patients' perception of confidence is also an effective reinforcement of self-managing their heart failure disease (Morley & Levin, 2021). Increasing a patient's confidence encourages positive behaviors and adherence to the plan of care (Zeng et al., 2019). Through its simple design and positive effects found from the studies listed above, implementation of the heart failure zone tool is an easy and effective way to assist patients in increasing their confidence to self-manage their heart failure diagnosis, increase knowledge and awareness of signs and symptoms, and will overall reduce 30-day readmissions. Because it is straightforward in its design, nurses can easily adapt the heart failure zone tool into current education.

Providing a laminated heart failure zone tool pamphlet will reinforce patient confidence in self-managing heart failure symptoms through the stop light tool as well as through the reflection of small

personal victories. Each day when patients record the color that corresponds with their symptoms, it arms the patient with knowledge and symptom recognition. The patients will be guided on the state of their health, instructing them on what services they should be using. The "Small Personal Victory" reflection assists with boosting our patient with confidence and provides ongoing reflection for the patient to ponder goals they may not realize they are achieving.

## Research Implications

With the heart failure laminated tool, patients may be better at recognizing when they need to seek help. Trends of positive patient outcomes and satisfaction will be seen with patients who are better able to recognize their symptoms and have greater understanding of symptom management. A future study can be conducted to examine the effectiveness of heart failure education in reducing 30-day readmissions in heart failure patients. A qualitative research study can be tailored to patients' lived experiences with heart failure. Future studies should also include randomized controlled trials with appropriate sample sizes. Another future study can incorporate e-module educational intervention to reduce unnecessary health care costs and limit any delay for patients who are seeking help when needed and emergency services will be used appropriately. The heart failure laminated tool reinforces the heart failure zone tool and seeks to increase heart failure knowledge and symptom recognition, confidence in self-maintenance. The DNP research team anticipates the implementation of the heart failure zone tool will improve symptom recognition and patient confidence.

## Recommendations

The recommendation is that Nebraska Medicine continue to utilize the heart failure zone tool in their education for hospitalized patients with heart failure. The specialized heart failure education with the heart failure zone tool increased patient's self-management confidence and heart failure knowledge. It is also recommended that they use the heart failure zone tool as a stand-alone laminated handout while providing specialized heart failure education. The laminated handout is more durable and more accessible for patients as it can be placed on the refrigerator door or bathroom mirror. The laminated handout can then serve as a quick reference guide for daily symptom management. As a separate handout, it may

reduce the feeling of being overwhelmed by too much information. The information provided in the handout is concise and easy to read, which can reduce confusion. Because the information is more accessible, patients have more self-awareness of their disease status, resulting in increased confidence in self-managing heart failure exacerbations.

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**Appendix A**

**Patient Handout**

**(Front)**

# Heart Failure **Zones**

Nebraska Medicine

## EVERY DAY

- Weigh yourself before breakfast every morning **after you empty your bladder** and record it
- Take your medication exactly how your provider prescribed
- Check for swelling in your feet, ankles, legs and stomach
- Eat foods that are low in salt or salt free
- Watch fluid intake to help prevent fluid buildup in your body
- Stay active. Find something you enjoy

*Provider Name:* _____

*Provider Phone Number:* _____

*Dry Weight:* _____

## WHICH ZONE ARE YOU IN TODAY?

| | You have: | What to do: |
|---|---|---|
| GREEN SAFE ZONE | • No shortness of breath<br>• No weight gain more than 3 pounds overnight or 5 pounds over dry weight<br>• No change in swelling in your feet, ankles, legs or stomach<br>• No chest discomfort, pressure or pain | • Keep up the good work<br>• Take your medicine<br>• Weigh yourself every day<br>• Eat a low salt diet |
| YELLOW CAUTION ZONE | • Weight gain of 3 pounds in 1 day or 5 pounds from baseline/dry weight<br>• More shortness of breath<br>• More swelling in your feet, ankles, leg or stomach<br>• Feeling more tired<br>• New or unusual coughing<br>• Dizziness<br>• Hard to breathe lying down. Need to sleep in chair or more pillows | • Call your doctor's office **if you have any of these symptoms** |
| RED DANGER ZONE | • Struggling to breath, even at rest<br>• Chest pain or discomfort<br>• Feeling faint<br>• Have confusion or cannot think clearly | • Call 911<br>• Get help<br>• Go to emergency room |

(Back)

## Small Personal Victories:

*Write down positive changes you see in your life. Responses can be recorded here with a dry-erase marker or in a notebook of your choice.*

## Remember to:

1. Take your medications as directed by your doctor
2. Weigh yourself every day and write down your weight
3. Stop using the saltshaker and follow any fluid restrictions recommended by your doctor
4. Go to your follow-up appointments

# Appendix B

## Nebraska Medicine Confidence Survey

Place Patient Label Here

**Date:** _____ **Time:** _____

### Heart Failure Self-Management Confidence Survey

| **Readiness for Self Care at Home** | I am not confident at all | I am somewhat confident | I am mostly confident | I am totally confident |
|---|---|---|---|---|
| 1. How confident are you that you can follow the diet recommended for your heart failure? | 1 | 2 | 3 | 4 |
| 2. How confident are you that you will be able to take your medications as prescribed by your physician? | 1 | 2 | 3 | 4 |
| 3. How confident are you that you will record your weight each day? | 1 | 2 | 3 | 4 |
| 4. How confident are you that you will know when to call the doctor about a change in your heart failure symptoms?<br>• What symptoms would you call about? | 1 | 2 | 3 | 4 |
| 5. How confident are you that you will be able to be as active as recommended by your health care team? | 1 | 2 | 3 | 4 |
| 6. How confident are you that you will be able to keep your scheduled follow-up appointment? | 1 | 2 | 3 | 4 |

7. Do you feel you were given the right information to manage your heart failure at home? Yes / No

# Appendix C

## Patient Knowledge Questionnaire

Patient Label Here

Patient Knowledge Questionnaire

1. Are you aware that you might have a heart condition?
   a. Yes b. No
2. Do you think your clinical condition has been clearly explained to you?
   a. Yes b. No
3. You are treated due to congestion as a result of a problem with:
   a. Heart b. Lungs c. kidney (choose one)
4. Did you receive advice about your daily fluid intake?
   a. Yes b. No
5. Did you receive advice to adjust your diuretic dose according to your fluid status?
   a. Yes b. No
6. What is the weight of one litre of water?
7. Do you check your weight regularly?
   a. Yes b. No
8. Does intake of fruits, vegetables, and soup contribute to your daily fluid intake?
   a. Yes b. No
9. Restriction of salt intake can help you in management of your condition
   a. Yes b. No
10. Do you check your blood pressure and heart rate regularly?
    a. Yes b. No

(Lainscak & Keber, 2005)

## Appendix D

## Demographic Information Interview Guide

1. How old are you? _____
   [Age should be recorded as a whole number. For example, 75 not 74.5]

2. What is your gender? Female Male Prefer Not to Answer

3. What is the highest level of education you have completed? _____
   [Education should be recorded as a whole number. Please see examples.]

   High School Graduate: 12

   Associate degree: 14

   Bachelor's Degree: 16

   Attended College for three years but did not graduate: 15

4. When did you get admitted to the hospital? _____
   [Write the full date. For example, August 15th, 2023.]

5. Do you know your ejection fraction? If yes, what is it? _____
   [Reassure the participant it is okay if they do not know it.]

6. Do you know your New York Heart Association Classification? If yes, what is it?
   _____
   [Reassure the participant it is okay if they do not know it.]

7. Time Education started (after consent is signed): _____

   Time Education ended (*once interview guide is complete*): _____