

Nursing Education for Heart Failure to Improve Patient Outcomes:

A Quality Improvement Project

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Abstract

Purpose: Heart failure (HF) is a complex chronic illness that requires extensive self-care management. For patients to effectively manage home self-care, nurses must provide adequate education based on patient specific needs and knowledge deficits. The objective of this project is to improve patient outcomes and home self-care abilities by improving the nursing staff's HF knowledge and increase the frequency of patient education provided by the nursing staff.

Methods: This quality improvement project was guided by the Iowa Model for Evidence Based Practice with identification of a problem, research solutions, and implement change. The project followed a pre- and post-implementation design. The nurse's HF knowledge and confidence was assessed prior to and following a specialized HF education session. Additionally, chart information was viewed pre- and post-intervention to obtain quantitative data regarding the HF education provided by the nursing staff.

Results: By providing specialized HF education, the nursing staff's knowledge and confidence in providing discharge education to HF patients significantly improved. Unfortunately, this had no significant impact on the quantity of discharge teaching provided to HF patients throughout their hospitalization.

Discussion: Based on the concept that improved knowledge has the potential to allow the nurses to better prepare patients for the transition to home self-care, the expected outcome of this project was to demonstrate that increased knowledge of HF principles would increase the amount of HF education provided by the nursing staff. It was found that more than 30-days is necessary to effect a significant behavior change that can improve the education provided to patients.

Keywords: discharge education, heart failure, nurse, nursing education, nursing roles, quality improvement

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With an aging population, healthcare's coordination and management of chronic illnesses are becoming increasingly complex. Older adults often are affected by multiple medical conditions which can be aggravated by common socioeconomic factors that afflict the elder population (Curiati et al., 2020). The complexity of caring for this aging population makes disease management more problematic and may make timely and safe discharge to home more difficult. Heart failure (HF) is a chronic condition that has been associated with increased length of stay (LOS) and 30-day readmissions due to complex home care regimens that patients may find difficult to learn and manage without proper education. Subsequently, for patients to safely transition to home self-care, nurses must ensure effective education is conducted throughout hospitalization and included in daily care planning.

Background

The Heart Failure Society of America (HFSA) reports that an estimated 960,000 new cases of HF are reported annually, and HF continues to place a large burden on the healthcare system (HFSA, n.d.). As patients move through the continuum of care, discharge delays can negatively impact the overall health outcomes of patients by increasing the risk of falls, hospital acquired infections, or adverse effects of medications or treatments (Agency for Healthcare Research & Quality, 2020; Curiati et al., 2020). In a study conducted by Sud and colleagues (2017), it was found that a short LOS for HF increases the likelihood of readmission for cardiovascular causes but lower for non-cardiovascular causes; conversely, a long LOS increased the likelihood of all cause readmissions. Organizations continue to be overwhelmed by the

pressure to develop quality yet efficient care coordination and management interventions for HF patients that can assist in reducing LOS and readmission rates.

According to the American Hospital Association (AHA), when compared to pre-pandemic data, patient acuity, as measured by the average LOS, has increased through 2021 (AHA, 2022a). The increase in patient acuity makes care coordination and the safe transition to post-acute care or home care more difficult, consequently, further exacerbating the issue of discharge delays. Moreover, the additional need for staff and resources due to discharge delays puts an added financial burden on hospital facilities who are already feeling the financial strain due to soaring costs of materials and labor (AHA, 2022b). An increased LOS can also delay bed assignments causing slower patient throughput, lower patient satisfaction scores, loss of potential revenue from new patients, and frustration amongst nurses and other hospital staff.

In comparison to LOS as an efficiency of care metric, the hospital readmission rate is a metric to measure the quality of care which has been linked to payment by the Hospital Readmission Reduction Program (HRRP), a Medicare valued-based program initiated by Centers for Medicare and Medicaid (CMS) (CMS, 2022). Although some hospital readmissions are unavoidable, increased readmission rates may indicate care providers are either not administering quality care or overlooking significant patient problems such as lack of funds for medications, inadequate housing, or low health literacy. Furthermore, readmissions cause financial hardships on patients and significant financial impacts to hospitals with payment reduction penalties imposed by CMS.

When viewing LOS and readmission rates as measures of healthcare efficiency and quality, evaluating them from a logistical perspective allows for an assessment of the discharge process as it relates to care coordination and transitional care. Discharging hospitalized patients

is a complex albeit routine process that requires extensive coordination and time. Patient discharge is a primary responsibility that falls on nursing. Just as good clinical decision-making and clinical judgment are necessary nursing skills that positively impact patient outcomes, the nurse's ability to adequately provide HF patients with discharge education on self-care is equally as important. Nurses must possess enhanced HF education knowledge and skills to initiate quality discharge education.

Unfortunately, the staffing shortages faced in healthcare has taken much of the nursing focus from the efficient and individualized coordination of care emphasized through the discharge process and placed it on daily patient care tasks such as medication administration, procedural preparations, daily hygiene, and other basic care and comfort features. Additionally, due to backflow of patients, nurses may feel pressured to choose between facilitating an efficient discharge or adequately providing education regarding home care needs (Kamau et al., 2022). With this change in workflow dynamics coupled with no formal HF discharge training during the onboarding process, it is common for nurses to provide patients with standardized and scripted discharge teaching only on the day of discharge.

Furthermore, with the current focus on reducing LOS and cost, physicians may not discharge the patients home in a state of complete physical wellness. Discharging a patient home based on clinical criteria may entail sending them home with new and complicated instructions on self-care management. For example, a patient may be discharged home on diuretic therapy twice a day with added instructions to not take the medication when the adverse effect of volume depletion is self-recognized. Unfortunately, many bedside nurses may lack the knowledge or confidence to educate patients on such issues.

Although educating patients is a fundamental concept in nursing, due to the time constraints, lack of knowledge, and unfamiliarity with recognizing barriers to learning, education topics tend to be approached haphazardly or in an unstructured method. With the complexity of managing a chronic illness such as HF in a population that is more vulnerable to adverse outcomes during a hospital stay, individualized and efficient home self-care education is vital (Curiati et al., 2020; Weiss et al., 2007). Accordingly, nurses play a critical role in coordination of care, patient education, and anticipating the discharge needs of the patient.

Moreover, daily patient education beginning as early as the day of admission is an expectation of quality nursing care. According to the Conditions of Participation set by CMS, for patients who are discharging home, the discharge planning process must include assessment of a patient's self-care capabilities, appropriate care instructions, and reflect that training has occurred to the patient or caregiver (HHS, 2013). The need to improve the nurse's knowledge of and confidence in HF education with an emphasis on proper documentation of HF education has never been more vital to improve patient self-care and outcomes.

Problem Statement

Patients with HF require extensive education for proper home self-care management. If the patient does not have the knowledge or capacity for self-care in areas such as medication regimens, fluid and sodium restrictions, daily weights, follow up appointments, or recognizing when to call the doctor, the probability of an extended hospital admission or readmission increases. Nurses must be knowledgeable in HF education principles and have the confidence to develop patient specific education for HF patients. When nurses do not provide quality education or fail to provide patients with the time for understanding, the patient does not develop adequate self-care capabilities, whereby increasing the possibility of readmission or extended LOS.

Organizational Analysis of Project Site

The project site is an acute care facility located in a large metropolitan area in the southeast. The site services a diverse population within its residing and neighboring counties. As measurable organizational and quality outcomes, readmission rates and LOS of the facility were evaluated. The project site self-reported a hospital wide LOS of 6.12 days which was higher than the national average of 4.9 days as reported by Agency for Healthcare Research and Quality (AHRQ, 2022). Additionally, the organization's HF readmission rate of 22% was above the 21.3% national readmission rate (Medicare.gov, 2023).

With this data, one may surmise that the organization services a vulnerable HF population that may lack the means or knowledge to self-manage such a complex disease and that after discharge, patients regress to their pre-hospitalization self-care behaviors. Nurses are a vital component to ensuring patients are assessed for discharge needs and providing adequate discharge education throughout the hospital stay. With the understanding that the quality and effectiveness of the discharge process and the nurse's ability to perform adequate HF education can have an impact the patient's ability for self-care, a Strength, Weakness, Opportunities, and Threats (SWOT) analysis was completed on the nursing involvement in the discharge process at the project site.

Upon analysis, it was determined that a strength of the organization's discharge process includes the nurses' utilization of case management and multidisciplinary rounding as a communication pathway for patient plans of care and discharge needs. Case management begins the discharge planning process within twenty-four hours of admission and communicates with nursing staff daily regarding patient needs through daily rounding. The multidisciplinary rounding also includes other essential members of the discharge process such as social work, unit

managers, and therapy disciplines which allows for nurses to be cognizant of anticipated discharge dates. Additionally, the use of an electronic health record that provides various languages and fonts for printed discharge papers further strengthens the nursing role in the discharge process.

While the organization utilizes multidisciplinary rounding in their discharge planning process, attendance of the admitting providers is not enforced which can limit critical communication to nursing. Due to insufficient communication of clinical discharge criteria or goals of care, this was identified as a weakness in the discharge process. When nurses are not informed of discharge criteria or care goals set by the admitting physician and then faced with specific questions by the patient, the nurse's knowledge and confidence can be impeded. When confidence wanes, so does the nurse's ability to adequately provide education or effectively evaluate learning progress with the patient.

Additional areas identified as weaknesses in the discharge process included staffing shortages; lack of initiative from nursing staff to complete daily patient education; lack of documentation on daily education; and slow movement of patients out of the rooms after a discharge order has been entered. Even though slow movement may be attributed to transportation delays and outside of the nurses' control, nurses become engrossed in daily care activities of other patients that they become unable to timely process discharge orders. Furthermore, the lack of initiative for education can be attributed to the nurses' lack of knowledge of core measure requirements, perceived lack of time, or lack of confidence in their own teaching abilities.

From the perspective of outside sources providing opportunities or threats to the nurses' involvement in the discharge process, the organization had adequate partnerships and community

resources as well as drug discount cards for patients discharging home. Access to both resources was made available to the nurses through the case management office. The unpredictable timing of the bed assignment to post-acute care facilities paired with the expectation of providing report to the facility as quickly as possible also threatened the daily workflow of an already overwhelmed nursing staff whereby negatively impacting the efficiency of the discharge process.

Literature Review

A literature search was completed between the dates of January 18 and March 21, 2023, using the databases Cumulative Index of Nursing and Allied Health Literature (CINAHL), Ovid MEDLINE, and PubMed. An advanced search strategy was utilized to include various combinations of the following keywords: *discharge education, heart failure, nurse, nursing education, nursing roles, quality improvement*. The primary Boolean operator AND was used in all databases. The search resulted in a substantial number of papers. To reduce the results, limitations such as peer reviewed only, published within five years, written in English language, and having full text availability were added to the advanced search. This final search resulted in 891 papers.

A rapid critical appraisal of the search results was completed and screened by one reviewer. The results were reviewed based on inclusion and exclusion criteria (see Table 1). During the initial review at the title or abstract level, the paper was removed if it did not meet the inclusion criteria or was a duplicate. This first round of appraisal yielded twenty-four potential papers. A more detailed appraisal was completed utilizing the full inclusion and exclusion criteria which resulted in fourteen articles evaluated from this literature database search. The level of evidence appraisal was then completed on fourteen papers by utilizing the Rating System for the Hierarchy of Evidence established by Melnyk and Fineout-Overholt (2019). The fourteen

papers consisted of two Level I (systematic review of randomized control trials [RCT]), two Level II (RCT), one Level IV (controlled cohort study), one Level V (systematic review of qualitative studies), and eight Level VI (qualitative study or quality improvement projects).

Nurses as Educators

Adequate discharge planning and effective transitional care interventions can improve patient outcomes and reduce the LOS and readmission rate (Suksatan & Tankumpuan, 2022). Suksatan and Tankumpuan (2022) found interventions that follow the Transitional Care Model (TCM) decreased the 30-day readmissions rates. Nine of the fifteen studies produced “significant and beneficial results” when utilizing nurses as primary care coordinators. Additionally, eight of the fifteen studies reviewed had knowledge or education as a key component of the intervention studied. Of the nine constructs of the TCM, three (screening, assessing and managing risks, and educating) are also key elements to the discharge planning process and place the nurse in the position to be a critical team member in the seamless transition of care.

Encouraging nurses to be leaders of patient education is crucial to patient outcomes. When patients become more knowledgeable about basic principles of HF management, their self-care behaviors improve (Kolasa et al., 2021; Son et al., 2020). In a systematic review by Son and colleagues (2020), eight studies indicated that an increase in patient overall self-care management knowledge produced significant decreases in the readmission rate. Additionally, the amount of education a HF patient receives increases the likelihood that the patient’s self-care abilities will also increase (Dinh et al., 2019; Kolasa et al., 2021). Kolasa and colleagues (2021) found a significant ($p < .001$) increase in self-care behaviors of 231 patients who completed a nurse led educational program that consisted of two education sessions while hospitalized. In a similar study, Dinh and colleagues (2019) found that when unit nurses provided individualized

60 minute discharge education sessions using the teach-back method in comparison to the routine discharge teaching of ten to fifteen minutes, the self-care knowledge of HF patients significantly improved ($p = .001$).

Patient Specific and Structured Education

Improved patient outcomes will occur with not only increasing the patient's exposure to HF self-care management principles but also tailoring and structuring the education to patient specific needs (Anzio et al., 2022; Chen et al., 2020; Cui et al., 2019; Dinh et al., 2019; Kranz et al., 2019; Moosa et al., 2022). Patient specific education improves readiness for discharge and better self-care management and can effectively reduce LOS and 30-day readmission rates (Anzio et al, 2022; Chen et al., 2020; Dinh et al., 2018; Kranz et al., 2019). In a pilot study by Anzio and colleagues (2022), the combination of providing detailed education regarding medications, daily monitoring needs (weight, sodium, and fluid intake), recognizing signs and symptoms, and self-care maintenance using a symptom tracker with a post discharge follow up phone call resulted in a 50% reduction in 30-day readmission.

Additionally, the usual discharge process of providing generic and scripted written instructions on the day of discharge may not be sufficient to affect a behavioral change necessary to attain home self-care capabilities and prevent readmissions. In a randomized controlled trial, Cui and colleagues (2019) found utilizing a structured education program had significant improvements in self-management abilities of HF patients.

Nursing Education

As a discharge responsibility, nurses must assess needs, recognize deficits, provide education, and ensure understanding to prepare HF patients for home self-care. Many nurses lack knowledge of HF education principles, confidence in assessing for learners needs, the ability to

provide adequate and effective discharge education, or the knowledge of how to verify learning has occurred and, subsequently, will not educate the patients on topics for which they are unfamiliar (Krowczynska & Jankowska-Polanska, 2020; Kuchenrither, 2021; Mattina et al., 2021). As discovered in a quality improvement project by Mattina and colleagues (2021), providing nurses with education on HF education principles significantly improved not only the number of HF patients educated (77% to 96.4%) but also the average number of days during admission that the patients were educated (1.64 days to 2.58 days). Furthermore, Caluya (2021) and Oliver et al. (2022) found a 21.4% and 24.3% reduction, respectively, in HF readmission rates after providing the nurses and HF care teams with educational interventions to improve staff HF management knowledge.

Evidence-Based Practice

Based on the review of literature, the aim of the project was to change the discharge education behaviors of the nursing staff by improving the nurse's knowledge of HF education principles and confidence in providing patient specific education. This quality improvement project incorporated a pre- and post-survey assessment of the nurse's knowledge and confidence and a pre- and post-intervention review of education documentation occurrences. The principal investigator (PI) provided HF education and patient education tips to the nursing staff in an informal, in-service format to ensure knowledge attainment.

The objective of this project was to improve education provided to patients by increasing the nurse's knowledge of HF principles and confidence in educating patients. Specifically, the project monitored the effect a specialized HF education intervention had on the nurse's knowledge of and confidence in educating HF patients whereby improving the amount of education provided to patients transitioning to the home self-care environment. The PI hoped to

answer the following PICO question: For the nursing staff (P), how does specialized HF education (I) compared to standard onboarding and competency education (C) affect the nurse's knowledge of, confidence in, and frequency of providing patient specific discharge education (O)?

Theoretical Framework

The project was guided by Bandura's Self Efficacy Theory (SET) which asserts that a person will more likely have behavior changes based on how they feel in, think about, or behave during specific situations (Bandura, 1977). In short, self-efficacy is the nurse's belief in their ability to change which encourages actions towards change. According to Bandura's SET, there are four sources of influence to help improve the nurse's self-efficacy: performance accomplishments, vicarious experience, verbal persuasion, and physiological or emotional state. The project addressed all constructs of Bandura's SET as shown in figure 1.

Performance accomplishments were addressed with the assessment of current knowledge and practice of HF education through the pre- and post-education survey. After the initial assessment, the nurse was provided specialized HF education and then retested with a survey. According to Bandura (1977), affirmation of correct knowledge or current practice will enforce the nurse's progression towards self-efficacy. When nurses begin to believe they can provide adequate education to patients, they will be more motivated to continue the daily educational practice and become role models for future staff nurses. This motivation can affect changes in the nursing staff's current discharge education behaviors which will lead to a positive impact on the patient's ability for self-care.

With modeling of behaviors, nurses can gain confidence and knowledge through vicarious experience. For instance, an inexperienced nurse's observation of a more experienced nurse providing daily discharge education to HF patients can help them recognize the importance of patient-specific education. Therefore, through witnessed and modeled behavior, inexperienced nurses are more likely to gain confidence and develop the same behavior when alone or not monitored. Thus, further enhancing both the experienced and the inexperienced nurse's belief in their ability to provide enhanced HF education to patients. Furthermore, due to an innate desire to do no harm to patients, it was assumed that nurses would continually self-assess and reflect on their own modeled behavior.

Verbal persuasion was provided in the form of education, affirmation, or encouragement. Nurses recognized their self-efficacy when other nursing staff, PI, or unit management encouraged the performance of daily HF education and documentation activities throughout the patient's hospital stay. With the provision of frequent reminders on HF education topics, nurses would continue to receive affirmation and encouragement regarding their knowledge of HF education principles. After assessment of knowledge gained by the patient, the nurse would then receive further affirmation of their ability to provide adequate HF education which can enhance their own self-efficacy.

Lastly, physiological and emotional alterations are barriers to learning and change. Although instructed to be autonomous and advocate for patients, many nurses are reluctant to engage in detailed disease education with patients due to lack of knowledge or confidence. Reducing the fear and anxiety nurses feel regarding educating patients on a complex illness such as HF can improve the nurse's motivation to learn and/or change current discharge education behaviors. Positive affirmation may also improve the nurse's confidence in adequately educating

patients on the complex home self-care regimen. Furthermore, once the nurse began to note that educating HF patients was becoming effortless, they would recognize their self-efficacy and maintain the change in discharge education behaviors.

Goals, Objectives, and Expected Outcomes

The goal of this project was to improve patient discharge education by enhancing the nursing staff's knowledge of and confidence in HF management principles. This goal was achieved through the assessment of the nurse's HF knowledge and a survey of confidence in their ability to educate the patient on the complex nature of HF home self-care. The following objectives were designed to ensure the project can accomplish the desired goals:

- The nursing staff completed the Nursing Knowledge and Confidence (NKC) survey (pre- and post-education module).
- The nursing staff attended a training session provided by the PI on HF education topics.
- The nursing staff performed daily education as evidenced by the documentation of HF education in the electronic health record.

The expected outcome of the project was twofold. Initially, there would be an improvement of nursing knowledge and confidence in HF management principles with a subsequent improvement in HF education documentation occurrences.

Setting Facilitators and Barriers

Utilizing care from all disciplines in healthcare has been shown to improve patient outcomes. Although discharge is a primary responsibility of nursing, nurses rely on other healthcare team members for assistance with complicated discharge cases such as those of HF patients. The PI identified case management, social work, nursing, nurse management,

cardiology providers, and administration as facilitators of the project. Additionally, due to the desire to reduce LOS and 30-day readmission, administration helped facilitate the project through support. Furthermore, after multiple face-to-face discussions, unit management was on board with the project and agreed to help facilitate; however, the PI provided all required education to nursing staff and was responsible for all monitoring of the project.

Although the PI identified nursing staff as facilitators, staffing was also identified as a potential barrier to successful completion of the project. In particular, the current staffing shortage was identified as the imminent barrier. As nurses tend to feel rushed and overwhelmed in the daily activities with increased patient loads, the PI anticipated nurses to arbitrarily finish the survey, avoid attending the specialized HF education in-service module, or be hesitant to commit to providing daily education to HF patients. With this knowledge, the PI offered in-services multiple times over a one-week period to accommodate various schedules and completed chart reviews three times weekly to identify deficiencies and provided encouragement and reminders.

Methods

Project Design

The project was guided by the Iowa Model of Evidence-based Practice which includes the steps of identifying a priority problem, appraising the evidence, piloting, evaluating, and disseminating the outcomes (Iowa Model Collaborative, 2017). This quality improvement project used pre- and post-survey data to compare the nurse's knowledge and confidence attained through the specialized HF education module. Additionally, the HF education documentation occurrences were assessed prior to project implementation and for the duration of the project.

Due to the project not incorporating human subject research, having minimal risk potential to patients, and being a quality improvement project, the PI received expedited review by the Institutional Review Board of the facility and the University of Alabama.

Project Site and Population

Although admission for a patient with HF is allowable throughout the facility, the PI chose to pilot the project on a 42-bed cardiac medical surgical unit. This unit was part of an acute care facility located in a large metropolitan area in the southeast. This acute care facility serviced a large elderly and lower income population and provided both inpatient cardiac services and outpatient observation cardiac services. Additionally, the pilot unit was serviced by a well-established cardiology and hospitalist service. Lastly, this unit had dedicated social work and case management services housed on the unit for enhanced collaboration.

The participants of interest were the nursing staff of the pilot unit. At the time of project implementation, the pilot unit was staffed by thirty-seven regular registered nurses and seven travel registered nurses with bedside nursing experience ranging from one year to 20 or more years. The patient population utilized for chart review was any patient 18 years of age or older meeting the inclusion criteria of having a primary or secondary medical diagnosis of HF.

Prior to project implementation, the discharge practice for the nursing staff began with an order for discharge being placed by the provider and ended when the nursing staff provided the patient with verbal and standard written discharge education regarding medications, disease process and management, and follow up appointments. When randomly polled by the PI, the nursing staff stated patient education was a primary responsibility of nursing; however, the staff self-reported this education was being done predominantly at discharge. This project sought to

improve the nurse's knowledge of and confidence in HF education for the purpose of changing the discharge education behaviors of the nursing staff. The anticipated change was to increase the amount of HF education provided to patients throughout their hospitalization.

Measurement Instruments

The instruments used for measurement were the Nursing Knowledge and Confidence (NKC) survey and electronic health record (EHR) chart reviews. The NKC was a twenty-question survey designed by the PI (Appendix A). The knowledge portion of the survey was reviewed for accuracy by a cardiology nurse practitioner. The data collected for this project consisted of the pre- and post-survey results of nurses who attended the HF education in-service module provided by the PI and the HF education documentation occurrences gathered from chart reviews pre- and post-education module. For patient selection used to gather data for reviewing documentation occurrences, the PI used existing reports available in the EHR to complete chart reviews.

Data Collection Procedures

The NKC survey results, both pre and post, were collected in electronic format using Qualtrics, an online survey application. Data was extracted and placed in an Excel document and stored on Box UA, a secure cloud storage platform. All identifying data was removed and the participant was assigned a unique identification number. Categorical variables such as degree earned, gender, age, years as a nurse, and primary shift (day/night) were also gathered. Additionally, to evaluate the HF education documentation aspect of the project, the PI collected pertinent data from the EHR in three areas: CHF Education Points, CHF Nurse Notes, and CHF Discharge Instructions (Table 2).

Pre-Intervention

The PI applied for and received expedited approval with the facility's Institutional Review Board (IRB) and the University of Alabama per IRB guidelines. Once all IRB approval was obtained, communication regarding the intervention was disseminated to all nursing staff on the pilot unit through email and/or text messaging. Additionally, flyers were posted throughout the unit and break areas to recruit for participation. Links to the NKC survey were supplied to all nursing staff through email, text messaging, and posted flyers during the week prior to the implementation of the educational intervention. To afford maximum attendance, the scheduling of the educational sessions was coordinated between PI and unit management based on review of the staffing schedule. In addition to the recruitment efforts, during the week prior to implementation of the intervention, a chart review was completed on HF patients who were admitted to the pilot unit to collect pre-intervention HF education documentation occurrence data. The chart was reviewed for the inclusion of "CHF Education Points" added to the education component of the EHR, the addition of standard "CHF Discharge Instructions" to the patient instruction section of the discharge navigator, and the inclusion of a "CHF Nurse Note" regarding HF education provided in the note's component of the EHR.

Intervention

After a week of chart review and recruitment, the PI provided a specialized education module to the nursing staff through an informal, in-service format on five separate occasions over a one-week period for maximum attendance and minimal disruption to workflow. The education module included a discussion regarding HF education principles and a review of the documentation requirements of education provided to HF patients. In addition to the facility requirements for education documentation, this project added the documentation of a nurse note

on HF topics covered for the purpose of providing interdisciplinary communication. Lastly, the education module allowed for an open discussion and was immediately followed by a post-intervention survey. The nurses in attendance were provided with a QRCode to complete the post-intervention survey through the online method of Qualtrics.

Post-Intervention

For six weeks after completion of the educational intervention, chart data was monitored for the three chart areas of *CHF Education Points*, *CHF Nurse Note*, and *CHF Discharge Instructions*. For the initial four weeks post intervention, the PI was visible and provided reminders, encouragement, and reinforcements to the nursing staff on the documentation areas for discharge education. During this four-week period, the PI completed chart reviews at various times at least three times weekly to gather data and evaluate the need for and to provide further reinforcements, motivation, and/or support to nursing staff. To evaluate whether the project affected behavioral change and to not provide further influence, during the final two weeks post intervention, the PI continued intermittent monitoring of chart data three times weekly away from the pilot unit to avoid being visible to the staff nurses.

Data Analysis

A statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS). The chi-square test of independence was used to examine the relationship between the three documentation elements monitored. The paired samples t-test was utilized to determine whether significant differences existed between pre- and post-intervention survey results. A p-value less than 0.05 was set to indicate statistical significance. Additionally, descriptive statistics were analyzed on nursing staff.

Cost-Benefit Analysis

With HF being one of the most expensive inpatient conditions, the benefit of reducing the LOS and the payment reductions for 30-day readmissions outweigh the cost of the nursing staff participating in a 30-minute training session. Additionally, improved education to HF patients has the potential to improve patient throughput with more efficient HF discharges allowing for increased hospital revenue through additional admissions. Adequate HF education will provide long term benefits to the patients by improvement of the patient's capacity for self-care which will reduce their need for hospitalization. The pre- and post-intervention survey was performed through a free online survey platform; therefore, there was no cost involved in the survey. The printing cost for project materials (flyers, PowerPoint, etc.) was covered by the PI. Lastly, the PI received no monetary compensation for time.

Timeline

The project ensued once IRB approval was obtained from both the facility and the University of Alabama. After approval was obtained, the PI reviewed documentation rates of the unit in the three charting areas and coordinated dates of education in-services with the unit management team. The project was implemented over a eight-week period. At the end of eight weeks, all documentation data was gathered and analyzed along with the pre- and post-intervention survey results. See Table 3 for a more specific project timeline.

Ethical Considerations/Protection of Human Subjects

The University of Alabama (UA) and the facility's IRB approval was obtained prior to initiating the project. Due to the project being a quality improvement project, the PI received an expedited review. All patient and participant information reviewed and gathered was protected

according to the Health Insurance Portability and Accountability Act of 1996 (HIPAA). All information obtained was aggregated data collected from patient files and did not include any patient identifiers.

Furthermore, the project imposed no more risk to patients than those patients who receive discharge education under the facility's current standard discharge process. Additionally, this study captured data using the Qualtrics survey platform. Qualtrics' servers are protected by multi-layered firewall systems. To improve the security of data storage, and minimize the potential for a breach, the data was stored in the UA Box system, a secure cloud-based system used for file and data storage that is encrypted and maintained on domestic servers.

Results

The pre- and post-intervention survey data was collected from twenty-six participants. The demographic makeup showed 92.6% were female, 7.4% were male, 70.4% held an associate degree in nursing, 29.60% held a bachelor's degree in nursing, 40.7% had been nurses for four or less years, and 44.4% had been a registered nurse for 5-10 years. The participants were an even mix of day shift and night shift staff. Details of the demographic make-up of the participants can be found on table 4.

Using the paired samples t-test and an alpha value set at 0.05, pre- and post-survey data reflected a significant improvement of overall knowledge [$t(26) = 12.90, p < .001$] and a significant increase in overall confidence [$t(26) = 6.65, p < .001$]. Specific knowledge areas that were found to have the most significant improvement were educating patients on appropriate fluid consumption [$t(26) = 4.23, p < .001$], use of salt substitutes [$t(26) = 4.91, p < .001$], use of NSAIDs for pain relief [$t(26) = 3.31, p = .003$], blood pressure that would warrant notifying the

healthcare provider [$t(26)=18.03, p<.001$], and hypotensive symptoms lasting less than ten minutes [$t(26)=26.00, p<.001$]. Conversely, in the areas of educating patients on fluid status signs and symptoms for which to monitor daily, there was no significant difference in pre- and post-survey data. Details of the knowledge portion of the pre- and post-survey analysis can be found in table 5. Regarding the confidence portion of the survey, the nursing staff was significantly more confident in assessing the patient's knowledge of their follow up treatment plan, $t(26) = 6.62, p<.001$. Details of the confidence portion of the surveys can be found in table 6.

A chi-square test of independence was performed to review the association between pre-intervention documentation occurrences and post-intervention documentation occurrences at the four week and six-week marks. As with the survey data, an alpha value of 0.05 was set for significance. With regards to the data collected on *CHF Education Point* added to the EHR, there was no significant association between neither pre-intervention and the week four, $\chi^2(1, n=21) = 2.63, p=.105$ nor the week six, $\chi^2(1, n=21)=0.130, p=.719$ chart data collected. Due to pre-intervention data being all constant "no" responses for *CHF Nurse Note* and *CHF Discharge Instructions* added to EHR, a chi-square test could not be performed to analyze the relationship of these data points; however, there was no significant difference in *CHF Nurse Note*, $\chi^2(1, n=29)=3.28, p=.070$, or *CHF Discharge Instruction*, $\chi^2(1, n=29)=2.78, p=.096$ at the week four and week six marks.

Interpretation/Discussion

After review of data analysis, one can conclude that although the knowledge and confidence increased in the nursing staff, this did not generate a significant impact to the documentation occurrences of HF education. Considering the project findings, it is possible that

more than knowledge and confidence is necessary to effectively change the behaviors of the nursing staff. Also, patients attempting to manage such a complex chronic illness such as HF require extensive teaching to improve their capacity for self-care. As nurses are an integral part of discharge teaching, it is vital that facilities encourage and enforce the documentation of education performed. Again, the nursing staff may require more specialized training on the best way to educate patients with such a complex condition.

While completing chart reviews during the six weeks post intervention, the PI noticed many of the patients who did not receive HF education had an admitting diagnosis other than HF. One may surmise that the nursing staff may not recognize alternate admitting diagnoses as results of either poor disease management or further progression of HF. An additional observation was that night shift nursing staff was less compliant with the education documentation requirements. This can be attributed to lack of training for the nursing staff hired directly into a night shift position. Additionally, the newly hired staff may be mentored by a night shift staff who may have little experience regarding discharge requirements or who may fail to see that discharge teaching is also a responsibility of the night shift staff.

Another observation of note was that the PI noticed a positive pattern of behavior change from select participants by their willingness to change and be compliant with education and documentation. This can have a positive impact on the sustainability of the project by labeling these nurses as champions of change and allowing them to mentor newly hired staff. Theoretically, two elements to affecting behavior change are that of vicarious experience and verbal persuasion. Having staff function as role models can positively impact the change direction of others.

Although in theory, behavior changes begin to occur within 30 days, in such a complex arena such as healthcare, there are more factors to consider when trying to effect behavior changes in nursing staff members. A few such factors are stress, short staffing, and burnout that the nursing staff is experiencing post pandemic. The pandemic altered normal daily activities, whereby allowing new and unwanted habits to be formed. To expect change in a suffering workplace, encouragements for compliance should be visible and evident to get the nursing staff to own the task of daily education of patients.

Conclusion

Despite the various HF therapies, patients continue to struggle with self-management of this chronic illness. Although national attention continues to focus on clinical tactics to reduce hospital LOS, readmission rates, and improve patient outcomes, HF patients require individualized discharge plans to help them transition to the home care setting. Nurses are pivotal in addressing the educational needs of HF patients and developing discharge plans to improve the patient's capacity for self-care. Unfortunately, many nurses lack training, knowledge, or confidence to perform such complicated educational care and the pandemic has changed nursing behaviors with regards to patient education. Reintroducing the knowledge of HF education principles and equipping nurses with the confidence to effectively assess for patient knowledge deficits, provide adequate patient education, and ensure the discharge plan continues to meet the needs of HF patients can effectively change the discharge behaviors of nursing staff. Placing emphasis on discharge teaching behaviors of the nursing staff will once again place nurses in the position of educational leaders and positively impact the overall patient outcomes.

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Table 1*Inclusion and Exclusion Criteria for Literature Review*

Inclusion criteria	Rationale	Exclusion criteria
<ul style="list-style-type: none"> • Studies of discharge interventions with nursing involvement • Studies related to patient discharge education • Adult med-surg population only • Studies of patients discharging to home self-care • Studies of nursing knowledge of HF education principles 	<p style="text-align: center;">Review is considering nursing knowledge of HF principles and patient education</p> <p style="text-align: center;">Education of patients is vital to adequate home selfcare management</p>	<ul style="list-style-type: none"> • Studies related to discharge to other healthcare facilities • Articles related to methods to changing processes • Study did not indicate patient education as an element of the intervention • Intervention was utilizing a discipline other than nursing

Table 2

EHR Data Review

	YES	NO
CHF Education Point added to Education tab of EHR		
CHF Discharge Instructions added to Navigator tab of EHR		
CHF Nurse Note added in Notes tab of EHR		

Table 3

Timeline of Project

Date	Task to Accomplish
June 26, 2023	Final IRB approval (facility and UA)
June 27-July 5, 2023	Project notification to nursing staff, recruitment, and chart data review
June 30-July 12, 2023	Pre-Intervention Surveys collected
July 6 - 12, 2023	Intervention performed with post-intervention Surveys collected immediately following education session
July 13 – August 24, 2023	Full project implementation and monitoring
September 2023	Data Analysis and Interpretation
October 16, 2023	Dissemination of Data

Table 4

Demographic Information

Demographic	Frequency
Age	22.20% 18-25
	29.60% 26-30
	18.50% 31-35
	7.40% 36-40
	7.40% 41-45
	3.70% 46-50
	0.00% 51-55
	11.10% 56 or older
Gender	7.40% male
	92.60% female
Highest nursing degree	70.40% Associate
	29.60% Bachelor
	0.00% Masters
	0.00% Doctorate
Years of registered nurse	3.70% Less than 2 years
	37.00% 2-4 years
	44.40% 5-10 years
	3.70% 11-15 years
	11.10% More than 15 years
	years
Primary shift	51.90% Day shift
	48.10% Night shift

Table 5

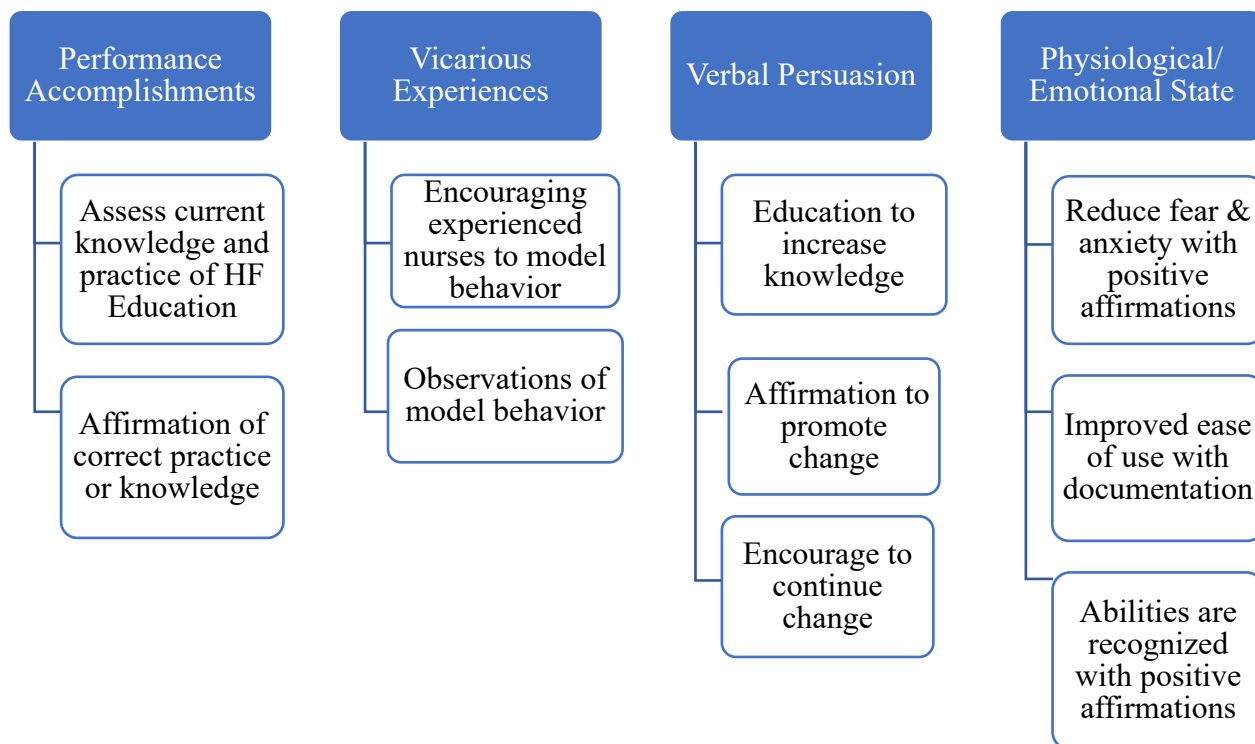
Means for Questions 7-19 (Knowledge) for Pre and Post Surveys and Paired Samples T-Test Results

Question	Pre Survey <i>M</i>	Post Survey <i>M</i>	<i>t</i> (26)	<i>p</i>
7	1.59	2.00	4.23	<.001
8	1.52	2.00	4.91	<.001
9	1.04	1.00	-1.00	.327
10	1.11	1.00	-1.80	.083
11	1.11	1.00	-1.80	.083
12	1.00	1.00	--	--
13	1.00	1.00	--	--
14	1.70	2.00	3.31	.003
15	2.00	2.00	--	--
16	1.19	1.04	-1.69	.103
17	1.04	1.96	18.03	<.001
18	1.00	1.96	26.00	<.001
19	2.00	2.00	--	--
Overall	1.33	1.54	12.90	<.001

Table 6

Means for Questions 20-26 (Confidence) for Pre and Post Surveys and Paired Samples T-Test Results

Question	Pre Survey <i>M</i>	Post Survey <i>M</i>	<i>t</i> (26)	<i>p</i>
20	4.30	4.81	5.29	<.001
21	4.37	4.81	4.00	<.001
22	4.41	4.81	3.70	.001
23	4.33	4.81	4.91	<.001
24	3.93	4.81	6.62	<.001
25	4.11	4.81	6.01	<.001
26	4.07	4.81	5.40	<.001
Overall	4.22	4.81	6.65	<.001

Figure 1*Application of Bandura's Self Efficacy Theory*

Note: This figure demonstrates the application of the project actions to the four constructs of

SET notated in blue.

Appendix A

Nursing Knowledge and Confidence (NKC) Survey

1-6		Demographic Data
F	7	Patients with heart failure should drink at least 8 eight-ounce glasses of water daily unless the doctor approves more.
F	8	Patients can use any salt substitutes to adhere to the sodium restrictions to their diet.
T	9	Sudden loss of appetite is a symptom that should be reported to their doctor.
T	10	Coughing and nausea may be symptoms of advanced heart failure.
T	11	Weight gain of 2-3 lbs. from their “dry” weight without other HF symptoms should be reported to their doctor.
T	12	Swelling of the abdomen may indicate worsening heart failure and should be reported to the doctor.
T	13	Patients should balance exercise and resting with feet up to control swelling.
F	14	NSAIDS are recommended when a patient experiences aches and pains.
F	15	Once swelling, coughing or shortness of breath has resolved, patients no longer need to perform daily weights.
T	16	One teaspoon of salt contains 2300 mg of sodium which is more than allowed in one day.
F	17	A blood pressure of 84/56 without any HF symptoms should be reported to the doctor.
F	18	Lightheadedness or dizziness when a patient stands but goes away after about 10 minutes should be reported to the doctor.
F	19	If a patient feels thirsty, it is okay to remove the restrictions and allow them extra fluids to drink.
1-5	20	How confident are you in assessing how much your patient knows about their medical care (treatments/medications)?
1-5	21	How confident are you in assessing what your patient knows about caring for themselves after going home?
1-5	22	How confident are you in assessing how much your patient knows about problems to watch for after going home?
1-5	23	How confident are you in assessing how much your patient knows about restrictions after going home?
1-5	24	How confident are you in assessing how much your patient knows about what happens next in their follow-up treatment plan after going home?
1-5	25	How confident are you in assessing how well your patient will be able to perform his medical treatments at home?
1-5	26	How confident are you in assessing how much help your patient will need with household activities after going home?