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Increasing Depression Screenings in Adults With Advanced Non-Surgical Heart Failure Using 2013 ACCF/AHA Recommendations and Healthy People 2020 Target Goals

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INCREASING DEPRESSION SCREENINGS IN ADULTS WITH ADVANCED NON-
SURGICAL HEART FAILURE USING 2013 ACCF/AHA RECOMMENDATIONS
AND HEALTHY PEOPLE 2020 TARGET GOALS

by

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Abstract

The purpose of this evidence-based practice project was to increase depression screenings in adults with non-surgical advanced heart failure using reliable and valid tools, 2013 American College of Cardiology Foundation/American Heart Association recommendations, and Healthy People 2020 Target Goals as a method to identify and facilitate appropriate mental health referral, patient education, and follow-up for depressive symptoms. Interventions took place June 5, 2017, through August 10, 2017. This intervention project involving 246 adults with advanced heart failure demonstrated that an evidence-based intervention for depression screenings increased the number of patients screened from 5% to 44%. At project completion, 65% of patients received patient education, 80% were offered a referral for further evaluation, and 81% were scheduled for follow-up. Of the 108 patients screened, 30% had positive Patient Health Questionnaire-2 screenings and 16% had score on the Patient Health Questionnaire-9 ≥ 10 . The analysis of the Patient Health Questionnaire-9 demonstrated that questions 1, 3, 4, and 6 had higher rates of occurrence in a largely Hispanic population of adults with non-surgical advanced heart failure. An analysis of the data demonstrated higher rates of depressive symptoms in patients with a New York Heart Association functional class III (51%) and class C (84%). This project also found that patients with advanced-stage heart failure and depressive symptoms were younger, had higher brain natriuretic peptide levels, and lower left ventricular ejection fractions compared with studies that include all stages of heart failure.

Keywords: depression, screening, heart failure, cardiovascular disease, mental health

The burden of depressive symptoms affects more than quality of life and extends to physiological health. Depression has been shown to have a negative impact on patient adherence to medical treatment and increases the risk of mortality in adults with heart failure (Wu & Moser, 2017). In 2013, the American College of Cardiology Foundation/American Heart Association (ACCF/AHA) updated the guidelines for the management of heart failure to include a recommendation for routine depression screenings in adult patients with heart failure (Yancy et al., 2013).

Depression is frequently undiagnosed by providers treating patients with heart failure, and symptoms are often attributed to limitations in cardiovascular functional capacity (Kim, Kim, & Hwang, 2015). In an effort to adhere to the current ACCF/AHA recommendations and improve the quality of care delivered, providers should implement routine evidence-based practice (EBP) depression screenings. This EBP project addresses the need to appropriately identify depressive symptoms in patients with advanced heart failure. In order to deliver the highest level of quality care, providers should provide routine depression screenings, mental health education, psychiatric referral, and short-term follow-up for patients with moderate to severe depressive symptoms.

Statement of the Problem

Heart failure and depression have serious effects on functional status and quality of life. Heart failure affects 5.7 million adults in the United States and it is estimated that 20% of heart failure patients experience depression (Centers for Disease Control [CDC], 2016; Okwuosa, Pumphrey, Puthumana, Brown, & Cotts, 2014). Patients with heart failure and depression are at increased risk for developing worsening symptoms, poor adherence to medical treatment, poor quality of life, and increased rates of recurrent hospitalizations (Lahlou-Laforêt, Ledru, Niarra, &

Consoli, 2015; Nair, Farmer, Gongora, & Dehmer, 2012). The 2013 ACCF/AHA guidelines for the management of heart failure added a recommendation to screen and treat all heart failure patients for depression (Yancy et al., 2013). Despite the well-known prognostic impact of depression in heart failure patients, evidence suggests that less than 15% of cardiac patients are screened and treated for depression (Ceccarini, Manzoni, & Castelnovo, 2014).

Assessment

The setting for this EBP implementation was an outpatient specialty clinic located in South Texas. The population focus for the clinic is adults with advanced heart failure. The clinic is the only one of its kind in South Texas that offers surgical interventions and advanced medical therapy for adults with New York Heart Association (NYHA) stage C and stage D heart failure. Heart failure is categorized into four classifications based on the severity of symptoms and objective cardiovascular assessment. A NYHA functional class of C indicates moderately severe cardiovascular disease with marked limitation in physical activity (AHA, 2017). A NYHA functional class of D indicates severe cardiovascular disease with severe limitations in physical activity (AHA, 2017).

The clinic provides two types of surgical interventions for patients with advanced heart failure. Interventions include left ventricular assist device (LVAD) implantation and orthotropic heart transplant (OHT). Approximately 22% of the clinic's total population meets criteria for surgical intervention. Patients that meet criteria for LVAD or OHT are automatically referred to a psychiatrist for a mental health evaluation prior to surgery. Prior to the project implementation, the remaining 78% of patients who did not meet criteria for surgical intervention were not screened for depressive symptoms. A microsystem assessment of the clinic revealed that there was no system in place for the screening of depressive symptoms within the clinic.

A fishbone diagram was created to pinpoint possible causes for the lack of depression screenings performed in the clinic. The fishbone diagram focused on patients, staff, processes, and technology. It was determined that the clinic was not using a standardized EBP tool to perform depression screenings. As a result, the clinic did not have a method in place for tracking depressive symptom severity. Furthermore, the staff was unaware of the new evidence supporting the use of depression screenings in adults with heart failure.

Organization's Readiness for Change

The key stakeholders in this EBP implementation are the providers, which include two cardiologists and one nurse practitioner, clinical staff, and patients. After reviewing the ACCF/AHA recommendations with the providers and staff, it was determined that patients may benefit from routine depression screenings using an EBP tool as recommended by the ACCF/AHA guidelines for the management of heart failure. Each staff member and provider demonstrated interest in participating in this project to implement the ACCF/AHA recommendations for the screening of depression in heart failure patients in the clinic as a method of improving the quality of care.

The organization's readiness for change was assessed using the Practice Improvement Capacity Rating Scale (Aligning Forces for Quality, 2016). Leadership support, availability of resources, competing priorities, communication, prior experience with other quality improvement projects, teamwork, reliability of data, information technology (IT) support, usefulness of the quality improvement project, and data collection tools were assessed using questions weighted for importance to successful practice improvement. The questions were scored as red (0 points), yellow (5 points), or green (10 points). The organization is considered ready for change when the final score is 250 or greater. The three providers and nine clinical

staff members were able to complete the Practice Improvement Capacity Rating Scale (Aligning Forces for Quality, 2016). The organization had a final score of 290, indicating clinic readiness to move forward with this EBP project.

Project Identification

Purpose and Objectives

The 2013 ACCF/AHA *Guideline for the Management of Heart Failure* recommends screening all heart failure patients for depression (Yancy et al., 2013). The purpose of this evidence-based practice project was to increase depression screenings in adults with non-surgical advanced heart failure using reliable and valid tools, 2013 American College of Cardiology Foundation/American Heart Association recommendations, and Healthy People 2020 Target Goals as a method to identify and facilitate appropriate mental health referral, patient education, and follow-up for depressive symptoms.

The objectives of this EBP project to improve quality of care were to:

1. Increase depression screenings from 5% to 15% by completion of the 10-week period using Patient Health Questionnaire (PHQ)-2 and PHQ-9 (Spitzer, Kroenke, & Williams 1999).
2. Increase referrals for depressive symptoms from 5% to 87% using PHQ-2, PHQ-9, and DSM-5 diagnostic criteria for major depressive disorder (MDD) (American Psychiatric Association, 2013), patient visit checklist (Appendix A), and AHA treatment algorithm for depression in cardiac patients.
3. Increase patient education from 0% to 76% by providing education handouts and information about available mental health resources.

4. Increase follow-up appointments for depressive symptoms from 0% to 76% by implementing a flagging system in paper charts to alert clinical staff and front desk staff to schedule a follow-up appointment.

Anticipated Outcomes

By meeting these objectives, there will be an increase in patients with depressive symptoms identified; providers will make appropriate referrals for depressive symptoms; and there will be an increase in patient education and follow-ups related to depressive symptoms. The clinic will align with Healthy People 2020 goals for depression screenings in adults and will be in compliance with the 2013 ACCF/AHA recommendations.

Summary and Strength of Evidence

Depression is a common co-morbidity among heart failure patients. Several studies acknowledge the effects of depression on heart failure and clinical outcomes. Patients with heart failure and depression are at greater risk for mortality, increased hospitalizations, reduced functional status, and poor quality of life (Johnson et al., 2012; Nair et al., 2012; Ramos, Prata, Bettencourt, Gonçalves, & Coelho, 2016; Rollman et al, 2012). Despite all of the available evidence, less than 15% of all cardiac patients are screened for depression (Ceccarini et al., 2014). Healthy People 2020 recommend increasing the percentage of depression screenings by at least 10 percent in adults aged 19 years and older (Office of Disease Prevention and Health Promotion, 2014). Recommendations also include increasing the proportion of outpatient settings that provide mental health treatment or referrals to 87% and increasing the percentage of adults with MDD that receive treatment to 75.9% (Office of Disease Prevention and Health Promotion, 2014). The 2015 U.S. Preventive Services Task Force (USPSTF) gives routine depression screenings in adults a “B” grading indicating there is high certainty that the net benefit is

moderate, or there is moderate certainty that the net benefit is moderate to substantial (USPSTF, 2015).

The definitive diagnosis of depression requires a comprehensive interview; however, several validated self-assessment questionnaires may help identify symptoms (Ceccarini et al., 2014). There is a consensus among several studies that the Patient Health Questionnaire (PHQ) has high reliability and validity in patients with heart failure. The PHQ-2 is an abbreviated version of the PHQ-9 and has been proven to be an adequate tool for screening patients with cardiovascular disease (Wallenborn & Angermann, 2013). A study performed by Piepenburg et al. (2012) compared the potential of the PHQ-2 and PHQ-9 to predict mortality and rehospitalization in 715 adults with heart failure. The study found that the potential to predict mortality and rehospitalization with the PHQ-2 and PHQ-9 were similar (Piepenburg et al., 2012).

A separate study performed by Haddad et al. (2013) conducted a diagnostic evaluation of 730 outpatients with a history of cardiac disease using the PHQ-9. Results of the study found that the PHQ-9 has a sensitivity of 0.59 and specificity of 0.95 in cardiac patients (Haddad et al., 2013). These results are based on using a threshold of 10 or greater as a positive screening in patients with cardiac disease. A similar study conducted by Bunevicius, Staniute, Brozaitiene, & Bunevicius (2012) examined 632 cardiac outpatients using the Beck Depression Inventory II (BDI-II) and demonstrated a sensitivity of 0.89 and specificity of 0.74. A third study tested the reliability and validity of the PHQ-9 in comparison to the BDI-II in a sample of 322 heart failure patients (Hammash et al., 2013). The results of the study established a Cronbach's alpha of 0.83, which supports the internal validity of the PHQ-9 (Hammash et al., 2013). The BDI-II is a reliable and valid tool; however, it is significantly longer (21 questions) as compared to the

PHQ-9 (Hammash et al., 2013). The PHQ-9 is a short self-administered 9-item questionnaire that takes most patients less than five minutes to complete. The PHQ-9 is acknowledged by the ACCF/AHA (Yancy et al., 2013) as a reliable and valid tool that can be easily implemented in the outpatient setting.

In addition to screening tools, providers should also supplement using a diagnostic tool to determine if an individual meets criteria for major depressive disorder (MDD) and referral (Yancy et al., 2013). The DSM-5 diagnostic criteria is considered gold standard for the identification of MDD (Wallenborn & Angermann, 2013). There is empirical evidence that supports the utilization of referrals for patients with positive depression screenings (Adams et al., 2012; Rollman et al., 2012; Moraska et al., 2013). The 2016 USPSTF Recommendation Statement for the Screening of Depression in Adults strongly recommends referring patients to a setting that can provide the necessary care for depressive symptoms (Siu et al., 2016). The 2016 USPSTF gives appropriate follow-up for depressive symptoms a “B” recommendation, which indicates there is high certainty that the net benefit is moderate or moderate to substantial (Siu et al., 2016). Suggestions for practice include offering a referral for further clinical evaluation by a professional qualified in the diagnosis and management of depression (Siu et al., 2016).

Methods

Project Interventions

Multiple studies were reviewed that established the most appropriate EBP tools and methods for the screening and management of depression in adults with heart failure. Information from the literature was synthesized and applied to create a new depression screening process for the clinic.

A pre-intervention chart review of 100 adult non-surgical advanced heart failure patient records was conducted November 1, 2016, through January 31, 2017. The data analyzed demonstrated that five (5%) patients had been previously evaluated or screened for depression, 10 (10%) patients had a current documented diagnosis of depression, five (5%) had received a referral to a mental health provider, and there was no evidence patients had received education or a follow-up appointment for depressive symptoms. The patient population is primarily male (75.8%) and Hispanic (51.7%) with a mean age of 58.7 ± 30 years. The majority of the patients had a NYHA class of C (64%), NYHA class III (44%), LVEF less than 30% (48%), and average brain natriuretic peptide (BNP) level of 487, a level indicative of heart failure when above 100 pg/mL. Common co-morbidities include diabetes mellitus (48%), dyslipidemia (37%), hypertension (41%), and renal insufficiency (37%). Additional pre-intervention demographic and clinical characteristic data are presented in Table 1 and Table 2. Patients with a history of OHT, LVAD, and potential surgical candidates were excluded from the pre-intervention chart review and EBP project because these patients undergo a separate mental health evaluation.

Table 1

Demographics of Pre-intervention Patient Population

Demographic	Mean	Percentage
Age	58.7	
Male		75.8%
Ethnicity/Race		
Hispanic		51%
Non-Hispanic White		34%
African American		13%
American Indian		< 5%
Asian		< 5%
Other		0%

Note: N= 100. Census data are for all adults with advanced heart failure not including LVAD and OHT patients. The table represents demographics of the pre-intervention patient population.

Table 2

Clinical Characteristics of Pre-intervention Patient Population

Characteristic	Mean	Percentage
BNP Level	487	
NYHA		
Class A		0%
Class B		7%
Class C		64%
Class D		29%
NYHA		
Class I		13%
Class II		31%
Class III		44%
Class IV		6%
LVEF		
> 55%		14%
40-55%		11%
30-39%		29%
< 30%		48%
Comorbidities		
Diabetes Mellitus		48%
Hypertension		41%
Dyslipidemia		37%
Renal Insufficiency		37%
Depression		10%
Cerebrovascular Disease		6%

Note: N = 100. Census data are for all adults with advanced heart failure not including LVAD and OHT patients. The table represents clinical characteristics of the pre-intervention patient population.

The project intervention included adding the PHQ-2, PHQ-9, and DSM-5 diagnostic criteria for MDD as routine depression screenings for all non-surgical advanced heart failure patients, a patient visit checklist completed by the providers, patient education, mental health referrals, an alert system for positive depression screenings, and short-term follow-up appointments for depressive symptoms. A depression-screening algorithm (Appendix B) was

developed to help guide providers and clinical staff in the depression screening process using EBP screening tools and recommendations for the treatment and management of depression.

Prior to implementation, all providers and clinical staff participated in a 30-minute education session (Appendix C). Starting on day one of implementation, each patient that entered the clinic for a provider appointment received the PHQ-2. The medical assistants and registered nurses administered the PHQ-2, calculated the score, and charted the results. Patients that screened positive as indicated by a PHQ-2 of three or greater were further evaluated by completing the PHQ-9. A PHQ-9 score of 10 or greater was considered positive for depressive symptoms. All positive PHQ-9 forms were filed under the psychosocial tab located in the patient chart and flagged for provider interpretation.

The providers assessed each patient using DSM-5 diagnostic criteria and a patient visit checklist to determine if the patient met criteria for a referral. The providers were also responsible for providing an educational handout to patients with a positive depression screening. Patients that required follow-up for depressive symptoms were offered a follow-up appointment in one-month as recommended by the AHA (Lichtman et al., 2008).

All non-OHT and non-LVAD heart failure patients entering the clinic June 5, 2017, through August 10, 2017 for a provider visit were included in the post-intervention data collection and analysis. There were 246 non-surgical advanced heart failure patients seen at the clinic during these ten weeks. Chart reviews were conducted on a weekly basis and bi-weekly meetings were conducted to discuss patterns, goals, tasks, and project progress. Each patient and staff member received a unique identifier. The project leader recorded results of the PHQ-2 and PHQ-9 screenings, number of referrals, patient education, and follow-ups. Information gathered

was analyzed using IBM® SPSS® version 24 to determine if there was an increase in the number of depression screenings, referrals, patient education, and follow-ups.

Prior to initiation of the project, the proposed plan was submitted to the university and hospital Institutional Review Boards for approval. The project was approved by exempt review as it was determined to be less than minimal risk indicating no known physical, emotional, psychological, or economic risk for the individual participating.

Organizational Barriers and Facilitators

The organization experienced multiple challenges with the implementation of the new depression screening protocol. Barriers included failure of staff and providers to follow through with the depression screening algorithm, lost screening forms, misplaced charts, and missing data. The staff became very diligent at screening all patients with the PHQ-2 form; however, certain staff members had a difficult time remembering to screen patients with the PHQ-9 and flag the chart for the providers. As a result, subsets of patients with a positive PHQ-2 or PHQ-9 score were not offered education, referral, or follow up. During the first week of project implementation the clinic had a screening rate of 25%, education rate 10%, referral rate 15%, and follow up rate of 70%. Adjustments were made to the depression screening process based on information obtained during the first two weeks of implementation and suggestions from staff and providers. One particular adjustment was the addition of the patient visit checklist. The inclusion of a patient visit checklist for the providers was a way to enhance accountability from the provider in regard to education, referral, and follow-up. By the 10th week of project implementation the clinic had a screening rate of 44%, education rate 65%, referral rate 80%, and follow up rate of 81%.

Lost screening forms, misplaced charts, and missing data presented a challenge in the clinic due to the use of a paper charting system. All PHQ-2 and PHQ-9 screening forms were to be placed in the psychosocial portion of the patient's medical chart and a copy of the forms was to be placed in a specified bin located in a high traffic area. Multiple PHQ-2 and PHQ-9 forms were found filed in the incorrect place and others were unable to be located.

Facilitators to the new depression screening protocol included staff and patient involvement in the project, routine short-term cardiac follow-ups, in-house licensed clinical social worker, and access to a psychiatrist for referrals. Although the new depression screening process encountered a few challenges, all staff members and providers were involved and provided suggestions on a continuous basis. Due to the severity of illness in individuals with advanced heart failure, most patients in the clinic are scheduled for a follow-up in one to two months. Rather than having to schedule a separate appointment for depressive symptoms, patients could be re-evaluated at their next appointment. The in-house LCSW was also a great resource. The LCSW, certified in performing psychosocial evaluations, was able to assist in the referral process. The clinic already used a nearby psychiatrist for the psychiatric evaluations performed on all OHT and LVAD patients. Prior to starting the project, a meeting with the clinic's psychiatrist was held. The psychiatrist agreed to accept referrals for patients with a positive PHQ-9 score and was also available for questions regarding individual depressive symptoms.

Results

Sample Characteristics

The cohort consisted of 246 patients, of which 108 were screened for depression using the PHQ-2. A total of 16 patients (15%) were previously diagnosed or currently being treated for

depression. The sample included advanced non-surgical heart failure patients that did not have a previous diagnosis of depression as well as those who were not currently being treated for depression for which each item of the PHQ-2 and PHQ-9 was completed (n= 108). The sample was primarily non-Hispanic white (49%), Hispanic (46%), and male (71%) with a mean age of 58 years. Forty-five (84%) patients were NYHA Class C and 46 (51%) were NYHA functional status III. The median BNP level was 545 pg/mL, with individual scores ranging from 22 pg/mL to 2,915 pg/mL. The majority of patients in the cohort had a LVEF of less than 30%, and 100% were diagnosed with other comorbid medical conditions, most frequently hypertension (49%) and dyslipidemia (36%), and renal insufficiency (28%). Further post-intervention patient demographic data for patients with depressive symptoms as indicated by a PHQ-2 score equal to or greater than three is presented in Table 3. Diagnosis related to heart failure was added to clinical characteristics in the post-intervention data collection. Additional post-intervention clinical characteristics are presented in Table 4.

Table 3

Demographics for Post-Intervention Patients with a Positive PHQ-2

Demographic	Mean	Percentage
Age	58	
Male		71%
Ethnicity/Race		
Hispanic		49%
Non-Hispanic White		46%
African American		6%
American Indian		2%
Asian		0%
Other		0%

Note: N = 31. Census data are for all adults with advanced heart failure and a PHQ-2 score ≥ 3 , not including LVAD and OHT patients. The table represents clinical characteristics of the post-intervention patient population.

Table 4

Clinical Characteristics for Post-Intervention Patients with a Positive PHQ-2

Characteristic	Mean	Percentage
BNP Level	545	
NYHA		
Class A		0%
Class B		4%
Class C		85%
Class D		11%
NYHA		
Class I		3%
Class II		15%
Class III		73%
Class IV		9%
LVEF		
> 55%		13%
40-55%		23%
30-39%		14%
< 30%		50%
Comorbidities		
Diabetes Mellitus		50%
Hypertension		34%
Dyslipidemia		6%
Renal Insufficiency		63%
Depression		28%
Cerebrovascular Disease		19%
Diagnosis Related to Heart Failure		
Dilated Cardiomyopathy		66%
Ischemic Cardiomyopathy		28%
Other		6%

Note: N = 31. Census data are for all adults with advanced heart failure and a PHQ-2 score \geq 2, not including LVAD and OHT patients. The table represents clinical characteristics of the post-intervention patient population.

Depression Measures

The clinic surpassed the goal of 15% depression screening rate with a total of 44% by the end of the 10-week project. Of the 108 heart failure patients without previously diagnosed

depression, 31 (29%) scored a 3 or greater on the PHQ-2, 17 (16%) scored a 10 or greater on the PHQ-9, and 12 (11%) were identified as moderately to severely depressed. Mean score on the PHQ-2 was 4 and the mean score on the PHQ-9 was 14, respectively. For the PHQ-2, the mean score for the first question, “little interest or pleasure in doing things” was 1.94 indicating patients report this symptom “more than half the days.” For the second question, “feeling down, depressed, or hopeless” the mean score was 1.69 indicating patients report this symptom “several days” to “more than half the days.” The analysis of the PHQ-9 demonstrated that questions 1, 3, 4, and 6 had higher rates of occurrence in a population of adults with non-surgical advanced heart failure. Depressive symptom characteristics of the sample are shown in Table 5.

Table 5

Question Analysis of PHQ-9 Results

Question	Not at all	Several days	More than 1/2 of the days	Nearly everyday
1. Little interest or pleasure in doing things	18%	15%	29%	38%
3. Trouble falling asleep, staying asleep, or sleeping too much	25%	8%	17%	50%
4. Feeling tired or having little energy	8%	17%	25%	50%
6. Feeling bad about yourself- or that you're a failure or have let yourself or your family down	8%	13%	33%	46%

Note: N= 17. Census data are for all adults with non-surgical advanced heart failure who completed a PHQ-9 form. The table represents the items with the highest percentage reported as nearly everyday.

Differences in the number of days symptoms were reported were noted between non-Hispanic white and Hispanic patients. Non-Hispanic white adults with non-surgical advanced

heart failure reported higher rates of moderate severe depressive symptoms (14.8%) when compared with Hispanic adults who reported higher rates of moderate depressive symptoms (10.9%). Table 6 shows percentages for the number of days symptoms were reported among non-Hispanic whites and Hispanic patients.

Table 6

Depression Severity among non-Hispanic White and Hispanic Adults

Ethnicity/Race	Minimal	Mild	Moderate	Moderate Severe	Severe	N/A	NP	Total
Non-Hispanic White	0.0%	0.0%	9.3%	14.8%	0.0%	72.2%	3.7%	100%
Hispanic	6.5%	2.2%	10.9%	2.2%	6.5%	69.6%	2.2%	100%

Note: N/A = Not applicable, NP = Not performed.

Education, Referrals, and Follow-ups

Prior to the project implementation, none of the advanced heart failure patients had received mental health education. After completion of the ten-week project, 65% of patients with a positive PHQ-9 received mental health education. Post-implementation data analysis revealed 80% of patients with a positive PHQ-9 were referred for further clinical evaluation and 81% received a short-term follow-up. During the 10-week project provider one saw 40 non-surgical advanced heart failure patients, provider two saw 35 non-surgical advanced heart failure patients, and provider three saw 33 non-surgical advanced heart failure patients that were screened for depressive symptoms using the PHQ-2 or PHQ-9.

Referrals, education, and follow up appointments were further analyzed by examining each provider on a bi-weekly basis. Provider 3 was the most consistent in providing patient

education with a total of 70% at the end of the 10-week project. This could be due to the fact that provider 3 saw more patients than provider 1 and provider 2 over the 10-week period. Figure 1 displays the bi-weekly education rates for each provider.

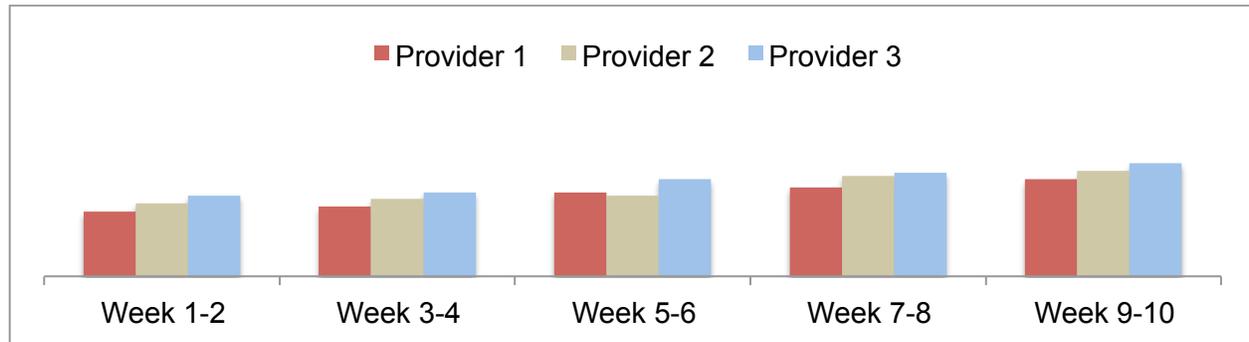


Figure 1. Depressive symptom education rates for each provider. This figure illustrates the weekly progress in education rates demonstrated by provider.

The clinic did not meet the goal of 87% for depressive symptom referrals; however, they were able to increase the pre-intervention rate from 5% to 80% by the end of the 10-week project. Provider 3 had the largest percentage of referrals by the end of the 10-week project with a percentage of 86%. Provider 1 had the greatest increase in the percentage of referrals from 25% to 80% by the end of the 10-week project.

Referral rates were impacted by patient decline for a referral. Of the 17 patients who met criteria for a referral, only seven accepted the referral. Ten patients refused the referral because they believed their depressive symptoms would improve or resolve with treatment of their heart failure symptoms. On the other hand, the four patients with a PHQ-9 equal to or greater than 20, which is indicative of severe depressive symptoms, accepted the referral as indicated by documentation in the patient visit checklist. Figure 2 displays the bi-weekly depressive symptom referral rates for each provider. The referral rates per provider in Figure 2 reflect the number of

referrals that were offered and accepted by the patient for individuals with PHQ-9 score equal to or greater than 10.

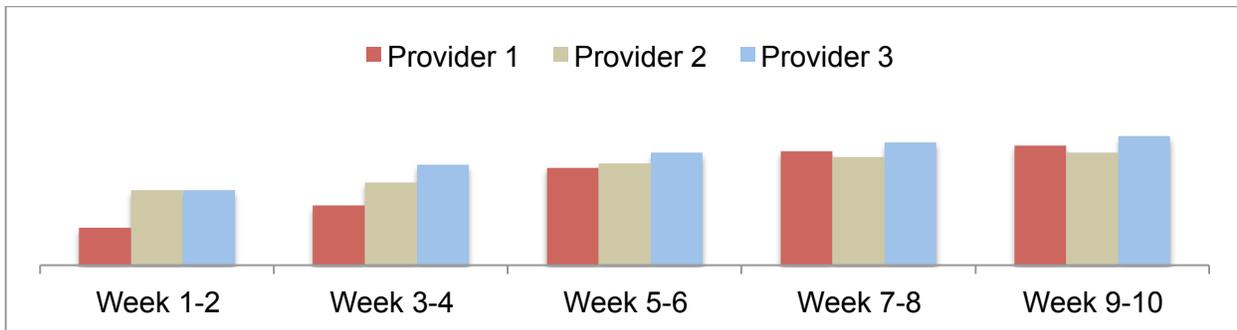


Figure 2. Depressive symptom referrals for each provider. This figure illustrates the weekly progress in referral rates demonstrated by provider.

The clinic exceeded the goal of 76% for depressive symptom follow-ups attaining 81% at the end of the 10-week project. The average follow-up rate for all three providers was 74% on week 1. Prior to the intervention, the clinic was using short-term follow-ups for most patients due to the sensitivity and severity of advanced heart failure. As a result, short-term follow-ups for depressive symptoms was the simplest intervention to apply since most patients follow up at least once a month. Figure 3 displays the bi-weekly depressive symptom follow-up rates for each provider.

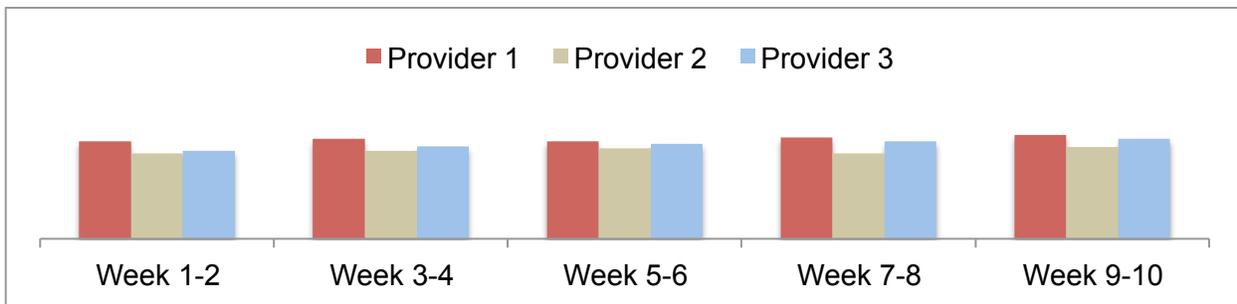


Figure 3. Depressive symptom follow-ups for each provider. This figure illustrates the weekly progress in follow-up rates demonstrated by provider.

Unintended consequences

Screening for depression is useful only to the degree that it improves clinical outcomes beyond those of the standard of care. To be successful, a routine depression screening process must identify a significant proportion of patients in whom depression has not already been diagnosed. In addition, sufficiently positive results must be seen in order to support the financial costs and potential consequences associated with the process. Potential consequences from routine screening for depression in patients with advanced heart failure include the treatment of depression in patients who are incorrectly identified and the treatment of mild symptoms that may resolve after improvement of cardiac symptoms.

Discussion

A thorough review of the literature found this to be the first evidence-based practice project to evaluate depressive symptoms in a largely Hispanic population with advanced non-surgical heart failure. The primary aim of this project was to increase depression screenings and facilitate the education, referral, and follow-up of depressive symptoms in patients with advanced non-surgical heart failure. This project demonstrated an increase in the number of patients who received depression screening, education, referral, and follow-up using an EBP depression screening process. The implementation of an EBP intervention for the screening of depressive symptoms in adults with non-surgical advanced heart failure provides a method to ensure all patients are screened and receive appropriate education, referral, and follow-up for their depressive symptoms.

This project adds pertinent information to the increasing body of literature using the PHQ-9 questionnaire as a measure of depressive symptoms in adults with advanced heart failure. Patient demographics, clinical characteristics, and PHQ scores were comparable with the

literature. Studies that focus on all stages of heart failure have shown the mean age for adults with NYHA functional class I-III and depressive symptoms to be 66.7 years, mean BNP level 69.1 pg/mL, LVEF 33.1, multiple co-morbidities, and mean PHQ-9 score 6.3 as compared to this project's findings of mean age 58 years, mean BNP level 545 pg/mL, mean LVEF < 30%, and mean PHQ-9 score of 14. (Brouwers et al., 2014; Wu & Moser, 2017). NYHA classification and co-morbidities are independent predictors of increased depressive symptoms (Brouwers et al., 2014). In a population of adults with multiple co-morbidities and an NYHA class III-IV, it is highly probable that these factors add considerable stress to the burden of heart failure. In addition, adults with a PHQ-9 score greater than 10 have higher rates of rehospitalization, independent of clinical severity of heart failure (Ketterer, Draus, Mccord, Mossallam, & Hudson, 2014). Based on the results of this EBP project, adults with advanced heart failure have higher PHQ-9 scores, which places them at a greater risk for cardiovascular mortality in comparison to adults with earlier stages of heart failure.

The analysis of the individual items on the PHQ-9 provides insight into the pertinent similarities and differences among heart failure and depressive symptoms. This project's findings revealed that patients with advanced stages of heart failure are more likely to report decreased interest in daily activities, difficulty falling asleep or staying asleep, feelings of fatigue, and poor self-esteem. Forty-six percent of patients reported feeling like a failure nearly everyday. These same patients also felt their chronic disease has had a negative impact on their family. Symptoms of fatigue and difficulty falling asleep can be attributed to either depressive or heart failure symptoms and should be further assessed. On the other hand, little interest in daily activities and poor self-regard that occurs on a daily basis are specific to depression and should be further assessed by a mental health professional.

Using an EBP tool to improve adherence to 2013 ACCF/AHA recommendations and Healthy People 2020 target goals may improve clinical outcomes for Hispanics with advanced heart failure and depressive symptoms. This project identified differences in the PHQ-9 questions between non-Hispanic white and Hispanic adults with non-surgical advanced heart failure. In this project, 33% of Hispanic patients reported depressive symptoms and the average PHQ-9 score among Hispanics was 15. In the non-Hispanic white population, 28% reported depressive symptoms and the mean PHQ-9 score was 13. These findings reveal that Hispanics with non-surgical advanced heart failure are at greater risk for complications from heart failure related to depression due to the severity of their depressive symptoms. This information is of significant importance because research demonstrates that healthcare facilities that primarily provide care to Hispanic adults have been shown to deliver lower quality of care, as measured by adherence to standard practice measures (Rodriguez, Joynt, Lopez, Saldana, & Jha, 2011).

Lastly, while other studies report positive and negative findings for the PHQ-9 in patients with heart failure, this project provides specific data for the individual items in the questionnaire. By assessing the results of each individual question in the PHQ-9, we were able to determine the incidence and severity of each symptom. This information helped to identify which symptoms are more common among a population of adults with non-surgical advanced heart failure.

Limitations

The implementation of the project was limited by the use of paper charts. Several PHQ-2 and PHQ-9 questionnaires were misplaced, which may have had a negative impact on the number of patients identified as having depressive symptoms. In addition, patients with a positive PHQ-2 or PHQ-9, whose questionnaires were misplaced, did not receive education,

referral, or follow-up. Paper charting also lead to inconsistencies in documentation of PHQ forms as well as patient demographics and clinical characteristics.

The length of the time for project implementation also prevented hard wiring of the routine into the providers' work patterns. Provider documentation of education was the most difficult component to track, even after the addition of the patient visit checklist. Despite receiving education, the providers often failed to complete the entire checklist. Certain providers were very diligent about documenting education in their progress notes, which helped keep track of education rates, but added a substantial amount of time to the data collection process.

Another limitation to note is the use of self-reported data, which increases the possibility of response bias. The patient's interpretation of each question is difficult to measure when using abstract concepts. A thorough literature review of the most appropriate depression screening tools was conducted prior to implementation and the two with the highest reliability and validity were applied to help minimize this limitation.

Recommendations

While the 2013 ACCF/AHA recommendations for the management of heart failure advise screening all patients with a history of heart disease for depression, further evaluation of depressive symptoms and heart failure severity during routine follow up intervals is needed to reveal more information about the correlation of these two diseases. This data may provide more information about the most appropriate education, referral, and follow-up process for patients with advanced heart failure. In terms of population characteristics, it may be beneficial to evaluate an individual's socioeconomic status in conjunction with depressive symptoms. Future research should also reassess depressive symptoms and heart failure severity during the follow-

up period to determine if treatment of depressive symptoms has a positive impact on heart failure outcomes.

Further research is needed to address knowledge gaps in heart failure and depression. Findings from the project, such as the PHQ-9 analysis and clinical characteristics can be used to develop further research and EBP depression screening methods in similar populations. Although this project provides valuable information about advanced stage heart failure and depressive symptoms, it is important to remember that the identification of depressive symptoms relies largely on clinical assessment. It is helpful to screen for depressive symptoms using an EBP tool as this is a simple and cost efficient way to improve clinical outcomes for adults with non-surgical advanced heart failure. Based on the results of the project, assessing for depressive symptoms should be incorporated as part of the routine clinical evaluation of adults with non-surgical advanced heart failure.

In regard to education, referral, and follow-ups, the 2013 ACCF/AHA recommendations for the screening of depression in cardiac patients do not recommend specific tools due to the lack literature available in adults with heart failure and depressive symptoms. More EBP projects are needed to identify the most appropriate education, referral, and follow-up tools due to the similarities in depressive and heart failure symptoms.

Implications for Practice

Implementation of routine depression screening for patients with advanced heart failure requires careful consideration. The current process of depression screening is based on a positive screening using evidence-based tools; however, research supporting the most appropriate methods for education, referral, and follow up are lacking. Based on the results of this project, current guidelines should consider recommending tools such as the DSM-V diagnostic criteria

for major depressive disorder and patient visit checklists as methods to increase education, referrals, and follow-ups. This project reveals that universal coverage of depression screenings in all heart failure patients is difficult to achieve, particularly when using a two-step approach. Using a slightly longer, one-step questionnaire may be more feasible in busy outpatient clinics.

Doctoral-prepared nurse practitioners are prepared to improve clinical outcomes by developing and evaluating new practice approaches in nursing (American Association of Colleges of Nursing, 2006). Projects such as the one completed provide the knowledge base to develop future interventions and guidelines. Identification of depressive symptoms in patients with heart failure is important to the evaluation and management of the underlying disease process. This project supports the use of the PHQ-2 and PHQ-9 by advanced practice nurses in the identification of depressive symptoms in patients with heart failure.

Conclusion

This project adds several unique characteristics to the existing body of evidence related to depression screenings in patients with heart failure. First, most available research examines adults with all stages of heart failure. This project focuses primarily on patients with a NYHA class of C or D. Secondly; the patient population in this project had a large Hispanic presence (46%). This is important as the findings provide details about a population that is largely underrepresented in current literature related to both heart failure and depression. The findings in this EBP project provide insight into the characteristics and evaluation of depressive symptoms in adults with advanced heart failure. This information can be used to develop new practice methods for the screening, referral, education, and follow-up of patients with depressive symptoms and advanced heart failure.

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Appendix A

Patient Visit Checklist

Patient Name: _____

Date: _____

Screened for depression? Yes ___ No ___
If yes, document depression severity _____

Was depressive symptoms education provided? Yes ___ No ___
If no, provide explanation _____

If PHQ-9 score ≥ 10 , was a referral provided? Yes ___ No ___
If no, provide explanation _____

Was a follow-up appointment scheduled within 4-6 weeks? Yes ___ No ___
If yes, provide follow-up date _____

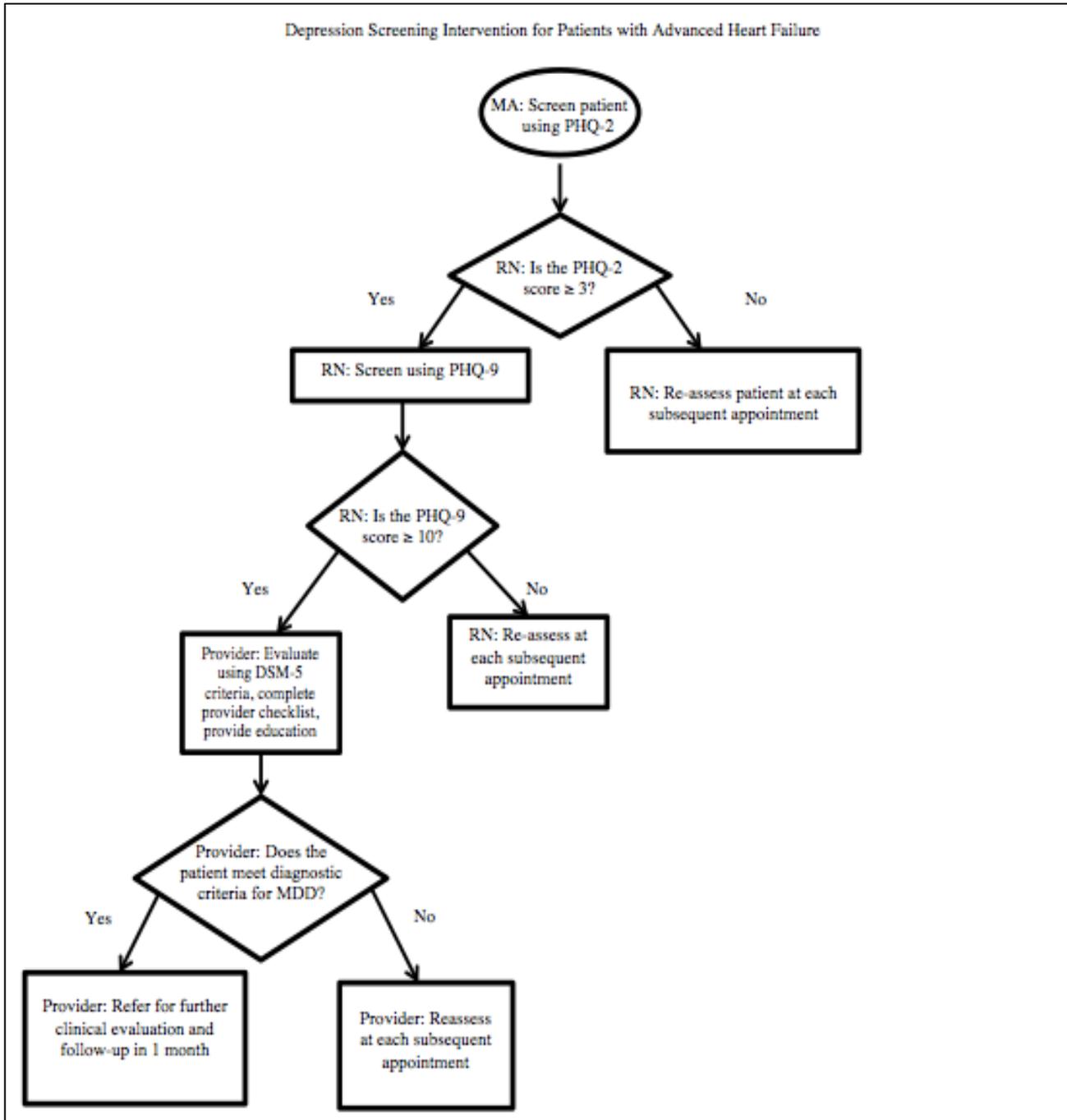
Were self-management goals of heart failure and depressive symptoms set? Yes ___ No ___
If yes, document patient goals _____

Provider Signature: _____

Date: _____

Appendix B

Depression Screening Algorithm for Adults with Non-surgical Advanced Heart Failure



Appendix C

Depression Screening Education Plan

Materials: Electronic copy of the 2013 ACCF/AHA *Guidelines for the Management of Heart Failure* for each staff member, patient education handout for each provider and staff member, copy of PHQ-2 and PHQ-9 in both English and Spanish for all staff members, copy of DSM-5 diagnostic criteria for depression for providers, copy of project protocol.

Education:

1. Screening process using PHQ-2 (all clinical staff)
 - a. All patients will be screened with the PHQ-2
 - b. How to complete and file PHQ-2 screening forms
 - c. How to administer screening
 - d. How to calculate patient score
 - e. PHQ-2 score of 3 or greater is considered positive
 - f. Continue with PHQ-9 if patient has a score of 3 or greater
2. Screening process using PHQ-9 (all clinical staff)
 - a. Patients with a PHQ-2 of 3 or greater will complete the PHQ-9
 - b. How to complete and file PHQ-9 screening forms
 - c. How to administer screening
 - d. How to calculate patient score
 - e. PHQ-9 score of 10 or greater is considered positive
 - f. Flag all positive PHQ-9 forms for doctor with red sticker and file under the psychosocial tab located in the patient's paper chart
3. How to interpret PHQ-9 score (providers only)
 - a. Learn how to determine depressive symptom severity (minimal, mild, moderate, moderately severe, and severe)
4. How to refer for further clinical evaluation by a professional qualified in the diagnosis and management of depression (providers only)
 - a. Learn how to use DSM-5 diagnostic criteria to determine the patients need for a referral
 - b. Learn how to complete patient visit checklist
 - c. All patients with a PHQ-9 of 10 or greater who also meet DSM-5 diagnostic criteria for MDD will be offered a referral
5. How to explain positive PHQ-9 results (providers only)
 - a. All patients with a PHQ-9 of 10 or greater who also meet DSM-5 diagnostic criteria for MDD will receive patient education
6. Follow-up
 - a. All patients with a positive PHQ-9 and DSM-5 screening will receive a 1-month follow-up
 - b. All patients will receive routine PHQ-9 screenings at each provider appointment.