IMPROVING DEPRESSION ASSESSMENT & MANAGEMENT IN HEART FAILURE PATIENTS AT THE PALI MOMI MEDICAL CENTER IN HAWAI'I

A PROJECT SUBMITTED TO THE OFFICE OF GRADUATE EDUCATION OF THE UNIVERSITY OF HAWAI'I AT MĀNOA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF NURSING PRACTICE

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Keywords: depression, heart failure, PHQ-9, depression measurement in heart failure.

Dedication

This work is dedicated to my fiancé.

Thank you for your unconditional love and support

during the challenges of graduate school and life.

Acknowledgments

I would like to express my deepest gratitude to everyone who supported me through the completion of this project.

Dr. Joseph Mobley, thank you for your patience & words of encouragement during the rough parts of this journey. I could not have imagined having a better project chair or mentor.

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Many thanks to Melissa Watson for stepping in and providing the necessary resources to start.

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Thank you for making me feel welcomed and supported.

Abstract

Background and Purpose: Heart failure (HF) is an increasingly prevalent disease and a major cause of morbidity and mortality around the world. Depression is more common in people with HF than in the general population however, it is under-diagnosed and under-treated. The purpose of this project was to implement a depression assessment program to improve staff knowledge about evidence-based depression screening and management guidelines, as well as increase the number of patients screened for depression in an outpatient cardiology setting.

Method and Results: Providers and staff participated in an educational presentation that covered various topics including depression incidence in HF patients, evaluating depression in the primary care setting, interpretation of the PHQ-9 score, and depression screening guidelines & recommendations. A pre- and post-test was used to measure if there was an improvement in staff knowledge after the educational intervention. The total staff knowledge rating of the pre-test showed a mean score of 5.9 and post-test score of 8.1. Changes from pre-test to post-test were assessed using a paired samples t-test which showed the results to be significant: $t(9) = -2.39$, $p<.01$. The t-value was then converted to a correlation to assess strength of effect. Results indicated a large effect size (i.e., >.50) with an $r = .62$. During the PHQ-9 pilot period, the depression assessment was administered to HF patients. The patient's PHQ-9 score was shared with the cardiologist for further evaluation and management. The number of completed PHQ-9 surveys were tracked at weekly intervals. Of the 87 patients who completed the PHQ-9 survey, the average score was 2.94. 61.7% of patients scored 0 to 4 (no depression), 9.3% scored 5 to 9 (mild depression), 9.3% scored between 10 to 14 (moderate depression), less than 1% scored between 15 to 19 (moderate-severe depression), and 0% of patients scored greater than 20 (severe depression). 2 patients were referred to the psychologist for further evaluation.

Discussion: Depression is under-recognized and under-treated in the HF population due to a lack of systematic assessment. Administering depression screenings in a cardiology outpatient setting affords a rich opportunity for identifying and managing patients at risk for psychosocial issues. Although our findings suggest a low prevalence of depression in the HF population, this project supports the continued use of the PHQ-9 survey as a cost-saving measure to enhance patient care. Additional implications included raising awareness on depression and the benefits of an EBP project.

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CHAPTER 1: INTRODUCTION

Background/Problem

Heart failure (HF) is a major cause of morbidity and mortality around the world. Among cardiovascular diseases, HF remains the third leading cause of death in the United States (American Heart Association, 2018). This condition afflicts more than 61.7 million people worldwide and 5.7 million adults nationally (Ponikowski et al., 2014). HF is one of the most expensive and difficult conditions to manage due to its chronic nature and worsening progression.

There are several modifiable risk factors that have been linked to adverse outcomes in the HF population. Depression has been proven to be an independent modifiable risk factor that is commonly experienced in people with HF (Moudgil & Haddad, 2013). The co-prevalence of HF and depression has been associated with an increased risk for recurrent cardiovascular events and mortality, as well as higher healthcare costs and lower quality of life. Clinically significant depression has been reported in approximately 20% of patients (Rutledge et al., 2006). The prevalence of patients with HF and depression vary from 11% to 35% in the outpatient setting and 35% to 70% in the inpatient population (Rutledge et al., 2006).

Multiple professional societies such as the American Heart Association (AHA) and American College of Cardiology (ACC) have recommended systematic depression screenings in HF patients however, depression remains under-diagnosed and under-treated. Screening for depression has yet to become a regular practice during routine visits. Proper identification and management of depression may be a practical and low-cost intervention to improve health outcomes and reduce healthcare costs in the HF population (Johnson et al., 2012).

Conceptual Framework

Facilitating change within a large organization required a systems-based approach. The Iowa Model of Evidence-Based Practice (see Figure 1) utilizes an algorithmic flow chart to evaluate current nursing practices and identify areas of improvement (Titler et al., 2001). There are seven steps of the Iowa Model: Selection of a topic; Forming a team; Evidence retrieval; Grading the evidence; Developing an evidence-based project (EBP) standard; Implementing the EBP; Evaluation.

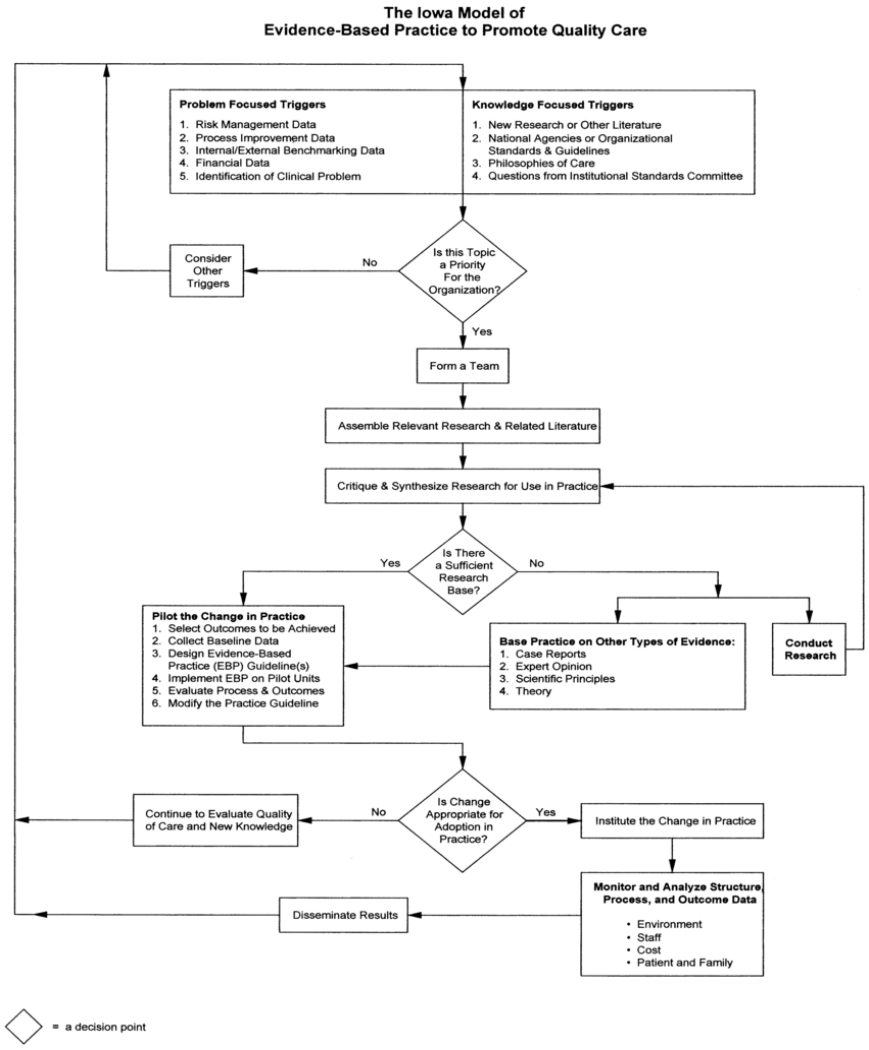

Figure 1. The Iowa Model for Evidence-Based Practice

Note: Retrieved from Titler et al. (2001)

Identifying triggers. The Iowa Model recommends identifying problem-focused or knowledge-focused triggers to stimulate critical thinking and guide the development of possible EBP changes (Titler et al., 2001). Since 2008, the deaths attributable to HF have been increasing in Honolulu (see Figure 2). The Pali Momi Heart Center (PMMC) services a large population of HF patients in Central Oahu. In 2011, HF was the leading cause of preventable hospitalization in Leeward Oahu (Health Communities Institute, 2013). Mental health was the most frequent cause for hospitalization among the 15 different preventable hospitalizations as it was the top reason for 1,176 hospitalizations in West Oahu (see Table 1). This was the trigger for this EBP project. The increasing mortality rates and hospitalizations attributable to HF and mental health issues in Hawaii need to be addressed. More research is needed on interventions that will improve health outcomes in this population.

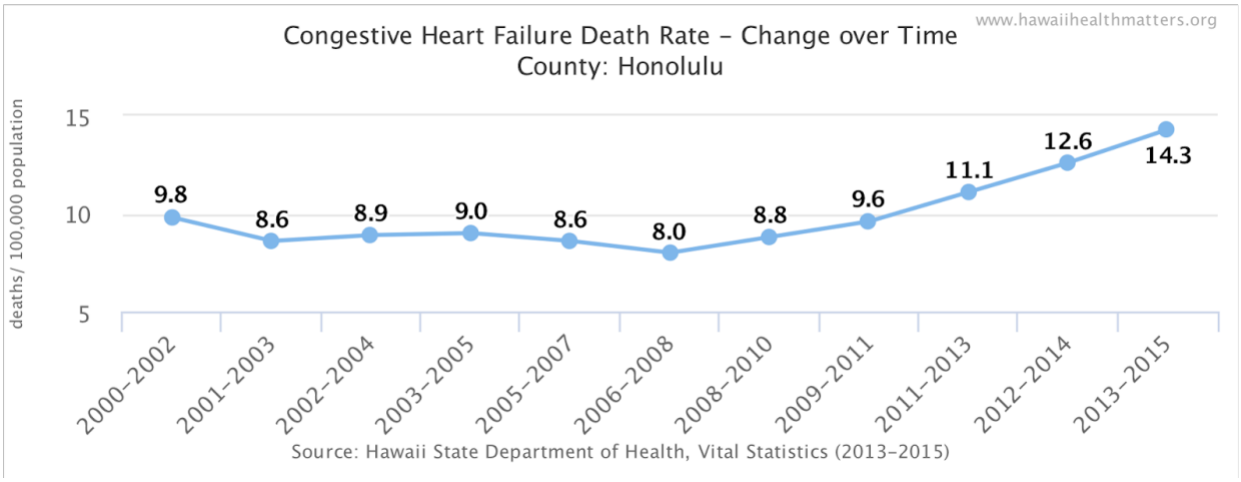

Figure 2: Congestive Heart Failure Death Rate – Change over time in Honolulu County

Note: Retrieved from the Hawaii State Department of Health, Vital Statistics (2015)

Table 1: Hospitalization Rates due to Preventable Causes in West Oahu, 2011

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Table 3.5: Hospitalization Rates due to Preventable Causes in West Oahu Hospital Service Areas, 2011

	Leeward Oahu		Wahiawa	
Preventable Cause	**Cases**	**Risk-Adjusted Rate per 100,000**	**Cases**	**Risk-Adjusted Rate per 100,000**
Mental Health*	771	346.9	405	481.6
Heart Failure§	844	454.9	257	405.3
Bacterial Pneumonia†	542	283.9	165	248.8
COPD or Asthma in Older Adults (Ages 40+)§	480	409.7	133	339.8
Low Birth Weight**	294	6.6	122	6.4
Urinary Tract Infection†	249	129.4	95	137.7
Diabetes Long-Term Complication§	220	110.1	57	83.1
Dehydration†	138	71	40	58.7
Diabetes Short-Term Complication§	139	60.7	27	30
Perforated Appendix***	62	24.3	11	14.4
Hypertension§	62	31	21	30.5
Rate of Lower-Extremity Amputation§	62	32.1	<10	--
Angina Without Procedure§	41	20.8	<10	--
Asthma in Younger Adults (Ages 18-39) §	33	33.6	<10	--
Uncontrolled Diabetes§	19	9.2	<10	--
Composite Hospitalization Rates				
PQI Composite – Acute Conditions	929	483.5	300	444.6
PQI Composite – Chronic Conditions	1880	966.7	522	777.2
PQI Composite	2809	1451.4	822	1221.7

* Rate for this cause is unadjusted
**Rate is per 100 live births
***Rate is per 100 appendicitis admissions
† Included in Acute Conditions Composite Rate
§ Included in Chronic Conditions Composite Rate

Compared to other service areas in Honolulu, Leeward Oahu and Wahiawa had the highest chronic composite hospitalization rates and highest total composite hospitalization rates in 2011. The acute composite hospitalization rate was higher in Kahuku compared to both West Oahu services areas.

Note: Retrieved from Hawaii Pacific Health Community Needs Assessment (2013).

Organizational priority. PMMC strives to improve outpatient care and decrease mortality rates through their "Quality of Care" initiatives. The 2012-2013 PMMC Community Health Needs Assessment report was created to provide a meaningful understanding of the health needs in the community. The report identified health disparities, the needs of vulnerable populations, and unmet health needs or gaps in services. Special consideration for mental health,

a chronic condition that significantly influences overall health, was deemed critical for achieving population health goals. Despite the recommendations made by the American Heart Association (AHA), systematic depression screenings in patients with chronic heart disease have not been implemented in routine visits, yet. As there is no protocol in place, proper treatment and quality care for HF patients poses a barrier to management of mental health concerns in the HF population.

Team formation. The implementation of this project was supported by the facility's outpatient director, office manager, and quality improvement (QI) team. The QI team included the Heart Center's cardiologists, registered nurse, medical assistants and front desk secretaries.

Literature Review and Synthesis

An electronic search was completed utilizing PubMed, CINAHL, Google Scholar, and the National Guideline Clearinghouse. Primary keywords and medical subject heading terms included: "depression", "heart failure", "depression screening tools", "depression screening tools/instruments", "depression assessment", and "depression measurement in heart failure".

Articles were limited to publication within the last 20 years, English language, adult, human subject results, and outpatients. Additional sources were identified using article reference lists.

A total of 55 articles published between 1998 and 2017 were identified; 35 were omitted based on lack of relevance to this project. The remaining 20 articles were examined. In addition, the following guidelines and recommendations for Depression Screening were reviewed: American Heart Association (AHA), U.S. Preventive Services Task Force (USPSTF), and American Academy of Family Physicians (AAFP). To grade evidence, Mosby's Levels of

Evidence Pyramid (see Figure 3) was used. Clinical practice guidelines (CPGs), review of CPGs, and literature reviews were classified on Mosby's "Other" level of literature.

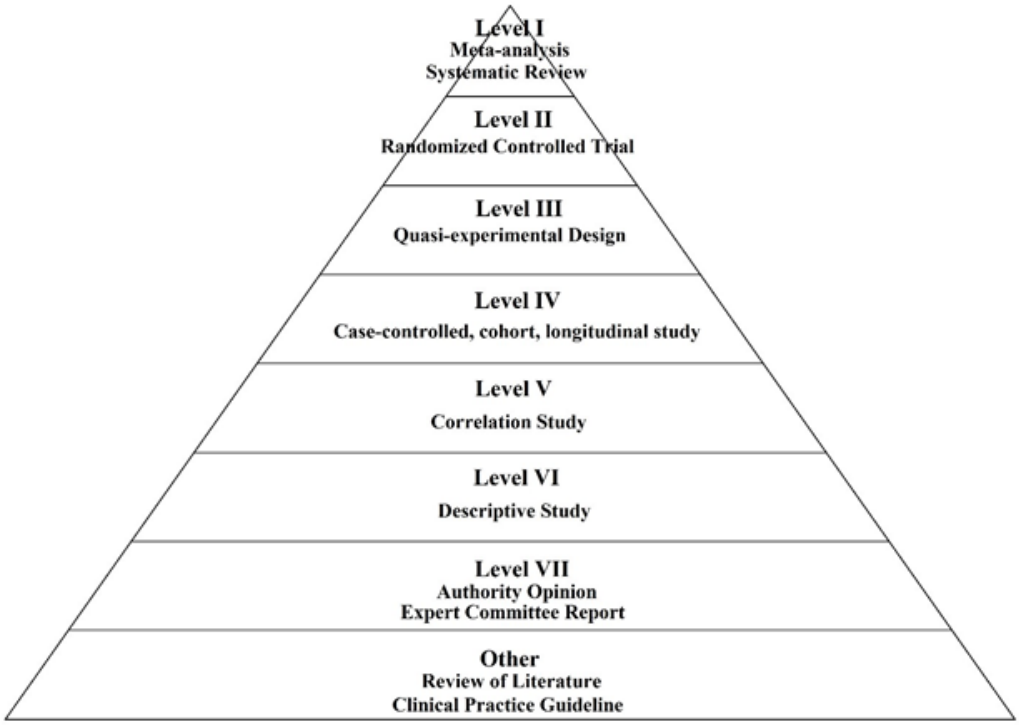

Figure 3. Mosby's Level of Evidence.

Note. Retrieved from Melnyk & Fineout-Overhold (2005).

Depression in heart failure patients. Depression was a common comorbidity in patients with HF (Glassman, 2018). Results from Rutledge et al.'s meta-analysis indicated that depression was present in 10 to 40% of HF patients, with greater prevalence rates in patients with a higher New York Heart Failure (NYHA) classification (2006) (see Table 2). Epidemiologists have recognized depression as an independent risk factor for coronary artery disease, equal to smoking, arterial hypertension and hyperlipidemia (Moudgil & Haddad, 2013). The combination of HF and depression has been associated with poorer clinical outcomes, decreased adherence to medical treatment, diminished quality of life and functionality, higher

hospital readmission rates, and a higher risk of mortality compared to HF patients without depressive symptoms (Rustad, Stern, Hebert, & Musselman, 2013).

Table 2. New York Heart Association Classification of Heart Failure

Class	Patient Symptoms
Class I (Mild)	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, or dyspnea (shortness of breath).
Class II (Mild)	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation, or dyspnea.
Class III (Moderate)	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, palpitation, or dyspnea.
Class IV (Severe)	Unable to carry out any physical activity without discomfort. Symptoms of cardiac insufficiency at rest. If any physical activity is undertaken, discomfort is increased.

Note. Retrieved from Rutledge et al. (2006).

Depression screening tools. In 2008, the AHA Science Advisory published an article that recommended screening for depression with either of two brief screening tools for depression (i.e., the 2-item or 9-item Patient Health Questionnaire [PHQ]) (Lichtman et al., 2008). Hammash et al. (2012) found that the PHQ-9 was a consistent and reliable depression screening instrument and supported its consistency when compared to the Beck's Depression Inventory (BDI) as the gold-standard. McManus, Pipkin, and Whooley (2005) found that the PHQ-9 was efficient and easily administered. It could be used successfully on inpatient cardiac units with good acceptance by staff and patients. PHQ-9 cut-off of ≥ 10 have resulted in excellent specificity (90%) but poor sensitivity (54%) in patients (McManus, Pipkin & Whooley, 2005). Smolderen et al. (2011) and Lee et al. (2017) found that using the PHQ-9 alone, compared to using the PHQ-2 and PHQ-9, was more effective in detecting rates of depression and treatment. After evaluating the AHA's recommendation of using the 2-step protocol of the PHQ

when screening for depression, it was found that the 2-step method has no clear advantage compared with the PHQ-2 alone or the PHQ-9 alone for predicting mortality in HF patients with depressive symptoms.

Conversely, McGuire, Eastwood, Macabasco-O'Connell, Hays, and Doering (2013) found that the PHQ-2 is as sensitive and specific as the longer versions when administered by staff nurses at an urban cardiac care unit. When comparing the three version of the PHQ screening instrument, each version had excellent specificity statistics of 91.2%, 92.6%, and 93.4%, respectively. For older persons, the sensitivity of the PHQ-2 has been reported as high as 100%.

Several studies highlighted the challenge of screening for depression in HF patients due to the overlap of symptoms. Fatigue, weight loss, poor sleep, and inability to concentrate were several symptoms attributed by both conditions (Rustad et al., 2013). Delville and McDougall (2008) also suggested that several instruments did not account for symptom overlapping and should be avoided when working with the HF population. Screening instruments that should not be used using this criterion include the Beck Depression Inventory (BDI), the Geriatric Depression Scale (GDS), the Center for Epidemiologic Studies-Depression Index (CES-D), the Hospital Anxiety and Depression Index, the Medical Outcome Survey-Depression Instrument, and the Zung depression Scale.

Depression treatment and management. There were several psychopharmacologic treatments indicated for depressed HF patients. Selective serotonin reuptake inhibitors (SSRIs) seemed to have significant beneficial effect with nearly no adverse cardiovascular effects. Roose et al. (1998) conducted a small, open-treatment, nonrandomized study where SSRI fluoxetine was given to 27 depressed psychiatric inpatients with CHF. Decreased heart rates were reported

by 6%, but no adverse effects such as tachycardia, hypotension, angina pectoris, extra systoles, or myocardial infarction occurred. In a different study by Glassman et al. (2002), SSRI sertraline was given to a group of 186 patients with CHF and severe depression. In this 6-month, double-blind, randomized study, medicated patients saw a significant improvement in depression scores (mean change of -12.3) when compared to the placebo group (-8.9).

Moudgil and Haddad (2013) suggested cognitive behavioral therapy (CBT) as a treatment for depression that is holistic and effective in decreasing depressive symptoms, increasing sleep efficiency, and ensuring completion of treatment. CBT was found to be even more effective than medication therapy alone. The strongest evidence for CBT involved a two-year follow-up study that concluded that patients who received a combination of medication (i.e. monoamine oxidase inhibitor) and cognitive therapy were more likely to relapse, compared to patients who received cognitive therapy alone (Moudgil & Haddad, 2013).

Innovation/Objectives

PICO statement. To clarify the aims and objectives of this project, the following problem, intervention, comparison, and outcome (PICO) statement and clinical question were developed.

Problem/Population (P): Depression incidence in adult heart failure patients.

Intervention (I): Implement a depression assessment program that involves educating staff on evidence-based depression assessment and management guidelines.

Comparison (C): Current practice or no screening.

Outcome (O): Improve staff knowledge about depression screening and management protocols and increase the number of patients screened for depression.

Clinical Question. Will the implementation of a depression assessment program improve staff knowledge about evidence-based depression screening and management protocols, as well as increase the number of patients screened for depression at the Pali Momi Heart Center Heart Center?

CHAPTER 2: METHODS

Project Design (QI/EBP)

The purpose of this EBP project was to translate the research on depression screening and management in the HF population. By applying recommended practices in real clinical settings, organizations could recognize areas of improvement and make system-level changes to continue delivering high-quality health care.

The main advantage of utilizing the EBP approach was the applicability of project interventions in other outpatient practice settings within the medical care system. Also, the user-friendly algorithmic guide of the Iowa Model of Evidence-Based Practice helped implement research into clinical practice (Titler et al., 2001).

Human Patients Consideration

An Institutional Review Board (IRB) was not necessary for this quality improvement project. An IRB is needed for projects that meet the definition of research however, this project did not control trials and patients were not randomized to different treatments. Patients were not mandated to participate or provide information if they did not want to. This project was not designed to cause any additional harm than any other usual treatment. Patients may have benefitted from receiving a more comprehensive depression assessments and physicians may benefit from receiving a better clinical picture of the patient's mental health. All patient

information was strictly confidential, and participants' rights were protected throughout the implementation of this project.

Practice Change Description

Increase staff knowledge. An educational presentation was conducted by the DNP candidate during the medical staff's lunch hour at the Heart Center. Food and drinks were provided by the leadership team for the staff's participation. A pre- and post-test prior to and following the presentation was administered to identify if there was an improvement in staff knowledge (Appendix A).

During the 30-minute PowerPoint presentation, providers and staff were educated on various topics including depression incidence in HF patients, evaluating depression in the primary care setting, interpretation of the PHQ-9 score, and depression screening guidelines & recommendations by the AHA. Additionally, discussion of how PHQ-9 results were to be communicated between medical assistant and provider, understanding PHQ-9 scores, and appropriate interventions and follow-up were facilitated during this meeting. A summary of the educational presentation content is below:

1. Overview of depression and heart failure
2. Consequences of undiagnosed and untreated depression in HF patients
3. Barriers to mental health care
4. Screening HF patients for depression
    a. Why should we screen for depression?
    b. When and how often should patients be screened?
    c. What is the PHQ-9 and why should we use it?
    d. Interpretation of PHQ-9 score

e. PHQ-9 management and treatment guidelines

5. Benefits of screening for depression in outpatient cardiology setting

Increase Depression Screenings. Prior to implementing PHQ-9 screenings to HF patients, an office flowchart was developed in collaboration with the quality improvement team. This flowchart was used to delegate appropriate staff responsibilities and procedures for administering and responding to PHQ-9 scores (Appendix D & E). Also, the office manager and information technology (IT) department worked together to formulate a master list of qualified patients scheduled between February to the end of March 2019. Inclusion and exclusion criteria were provided by the DNP candidate. This master list determined which patients would be given the PHQ-9 survey when they presented to the office.

A daily list of HF patients with patient-labeled PHQ-9 surveys (Appendix B) were provided to the front-desk secretaries. Copies of the daily list were also provided to the medical assistants to keep track of which patient's they would need to collect the survey from.

Each PHQ-9 survey was scanned and uploaded into the patient's electronic medical record for tracking purposes. The original PHQ-9 survey was collected in a drawer located by the front-desk secretaries and easily accessible to all staff.

For a one-month pilot period, the PHQ-9 survey was administered to qualified patients of the study. The number of screenings administered and completed was tracked by the DNP candidate at weekly intervals. The DNP candidate held bi-weekly meetings with the staff to discuss and assess the progress of this initiative. The DNP candidate worked in cooperation with the quality improvement team to record and track proper utilization of the PHQ-9 screening tool. Data was shared with the medical staff during the final stages of the project.

Program Evaluation Plan

Evaluating Staff Knowledge. Results of the pre- and post-tests were converted into a mean score. Scores were compared using a matched pairs t-test to determine if the t-statistic was significant ($p<.05$). Results that identify that the post-test scores were significantly higher than pre-test scores would indicate that the educational initiative was effective and there was an improvement in knowledge about depression and depression screening in HF patients.

Evaluating Screening Tool Use. Data collected during the PHQ-9 implementation period was used to evaluate if there was an increase in the amount of depression screenings administered to qualified patients every week. The number of completed PHQ-9 surveys that were collected each week was used to determine if at least 50% of qualified patients were screened.

Weekly comparisons of the PHQ-9 use was shared with the medical staff through informal conversations and team meetings to demonstrate project progression.

Sampling Plan

Description of Group/Population. The Heart Center's interdisciplinary team was comprised of approximately 17 staff members who provide direct patient care: five physicians, one nurse practitioner, one registered nurse, six medical assistants, and four front desk secretaries. Staff members were asked to be part of the study and considered a convenience sample. The standard of inclusion for medical staff participants included more than three-months of work experience at the Heart Center and over the age of 18.

Patients who were screened for depression using the PHQ-9 survey were also considered participants of this project. Patient inclusion criteria included being over the age of 18 and having a current heart failure diagnosis established under the problem list tab in their electronic medical record. Patient exclusion criteria included the following: unable to read and speak

English, history of being diagnosed with depression as evidenced in their electronic medical record, screened for depression by another provider with the PHQ-2 or PHQ-9 within the last six months, and/or diagnosed with some form of cognitive impairment such as Alzheimer's disease or developmental delay.

Setting. The project took place in a busy cardiology outpatient practice in Central Oahu. The PMMC Heart Center, located on the sixth floor of the physician's office building, is one out of four Heart Centers in Hawai'i that is comprised of expert cardiologists who diagnose and treat a full spectrum of heart and vascular conditions for all patients.

Resources. This project was created to pilot an intervention that would address the mental health needs of the community. Partners and executive members of the Hawai'i Pacific Health organization recognize the important component that mental wellness plays on mind and body health.

Key stakeholders included the organization, the facility's outpatient director, office manager, providers, medical staff, patients, and the information technology department. The DNP candidate met with both the leadership and quality improvement team to discuss implementation of depression screening protocols in the cardiology practice.

Project Timeline

The proposed project timeline began in May 2018 and culminated in May 2019. After completion of the literature search and synthesis outlined in Chapter 1, the next steps of the Iowa Model were executed (Titler et al., 2001). Step 5, or piloting the practice change, was completed by the end of December 2019. Subsequently, Step 6, or the full practice change implementation, began in January 2019. The implementation lasted for one month and concluded in March 2019.

Step 7, or the evaluation of the outcomes, took place throughout Spring 2019 and culminated with the final project defense in April 2019 (Appendix C).

CHAPTER 3: RESULTS

Data Analyses Findings

Staff knowledge. Ten staff members consisting of two males and eight females participated in the teaching intervention. The group included two cardiologists, one registered nurse, three medical assistants, and four front desk secretaries. All participants were over the age of 18 and employed at the Heart Center for over 3 months.

Changes from pre-test to post-test were assessed using a paired samples t-test which showed the results to be significant: $t(9) = -2.39$, $p<.01$. The t-value was then converted to a correlation to assess strength of effect. Results indicated a large effect size (i.e., >.50) with an $r = .62$ (see Table 3).

Table 3. Pre and Post Test Sample Paired T-Test

	N	Mean	mean D	Se mean D	t	p
Pre-Score	10	5.9	-2.2	0.919	-2.3941	0.0001
Post-Score	10	8.1				

Depression screening results. Of the 152 patients scheduled during the project pilot period, 21 patients rescheduled or cancelled their appointment. Complete data was available for only 131 patients. 15 patients were excluded because they did not have a heart failure diagnosis seen in their EMR, 4 were excluded due to having a prior diagnosis of depression, 5 were

excluded because they were screened for depression using the PHQ-2 or PHQ-9 in the last 6 months. Ten patients were not given the survey due to staff error, and 10 patients declined to complete the survey.

A total of 87 patients completed the PHQ-9 survey. The sample consisted of 59.8% males and 40.2% females (Figure 4). The average age was 69 years and the highest number of patients were between 70 to 80 years old (Figure 5). The youngest patient was 40 years old, while the oldest patient was 96 years old. Majority of the scheduled visits were follow-up appointments (Figure 6). Table 4 displays a list of ICD-10 codes and the HF diagnosis. The most common ICD-10 code or HF diagnosis was I50.9 or unspecified HF. The least common ICD-10 code or HF diagnosis was I50.20 or systolic HF (Figure 8).

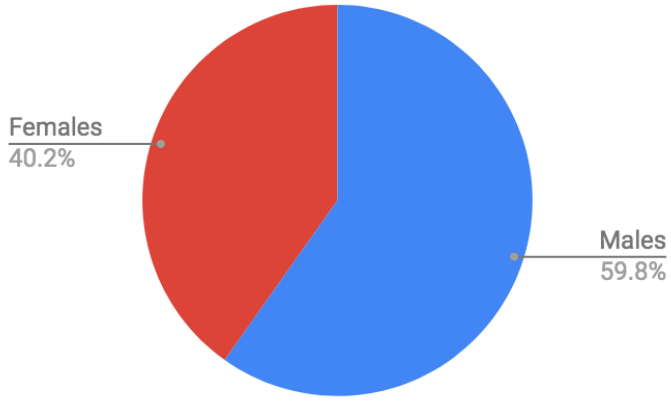

Figure 4. Gender of participants (n=87)

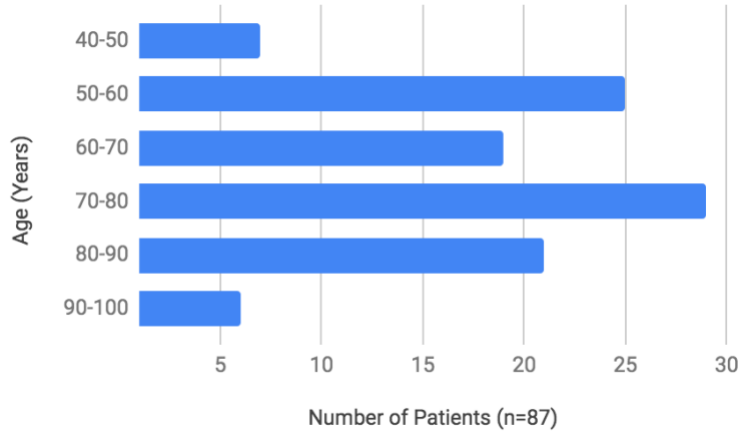

Figure 5. Frequency by Age (n=87)

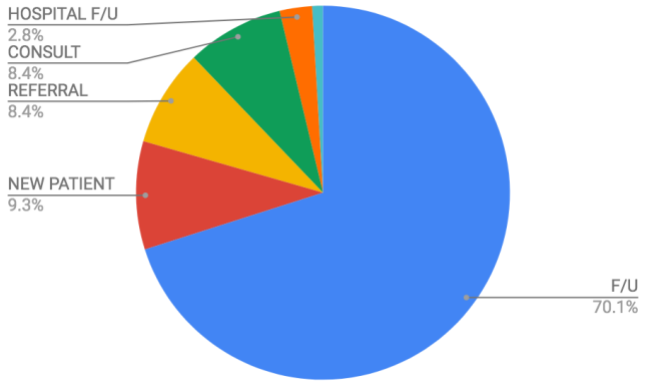

Figure 6. Frequency by Appointment Types (n=87)

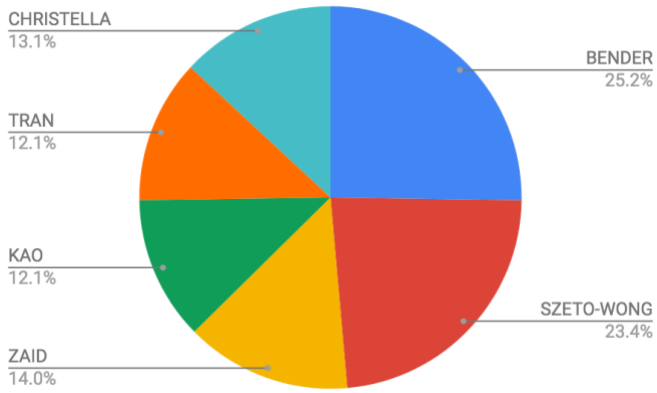

Figure 7. Frequency by Provider (n=87)

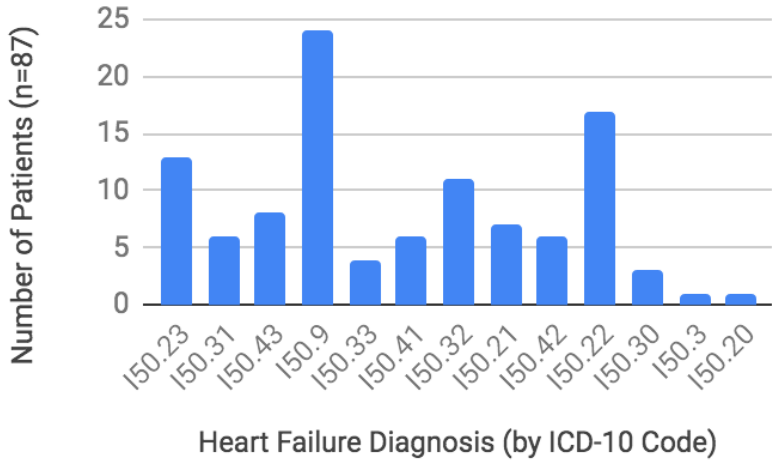

Figure 8. Frequency by HF Diagnosis

Table 4. ICD-10 Code and Heart Failure Type

ICD-10 Code	Heart Failure Type
I50.20	Systolic
I50.21	Acute systolic
I50.22	Chronic systolic
I50.23	Acute on chronic systolic
I50.30	Diastolic
I50.31	Acute diastolic heart failure
I50.32	Chronic diastolic
I50.33	Acute on chronic diastolic
I50.40	Combined systolic and diastolic
I50.41	Acute combined systolic and diastolic
I50.42	Chronic combined systolic and diastolic
I50.9	Heart failure, unspecified

Based on the 87 completed PHQ-9 surveys, the average PHQ-9 score was 2.94. The lowest score was 0 and the highest score was 19. In terms of depression severity, 61.7% of patients scored 0 to 4 (none or minimal depression), 9.3% of patients scored 5 to 10 (mild depression), 9.3% of patients scored 10 to 14 (mild/moderate depression), less than 1% of patients scored 15 to 20 (mod/severe depression), and 0% of patients scored more than 20

(severe depression). Of the 12 patients who indicated a PHQ-9 score of 10 or more, 2 patients were referred for further psychological evaluation. One patient declined referral.

Interpretation of Results

A low prevalence of depression found in this study. Less than 20% of total participants (or 21 patients) indicated mild, moderate, or moderate-severe depression. 13.8% had a PHQ-9 score equal to or greater than 10. Approximately 60% of participants indicated no/minimal depression. Of the 107 we attempted to screen, 18.7% of patients did not complete the PHQ-9 survey due to staff error or because the patient declined.

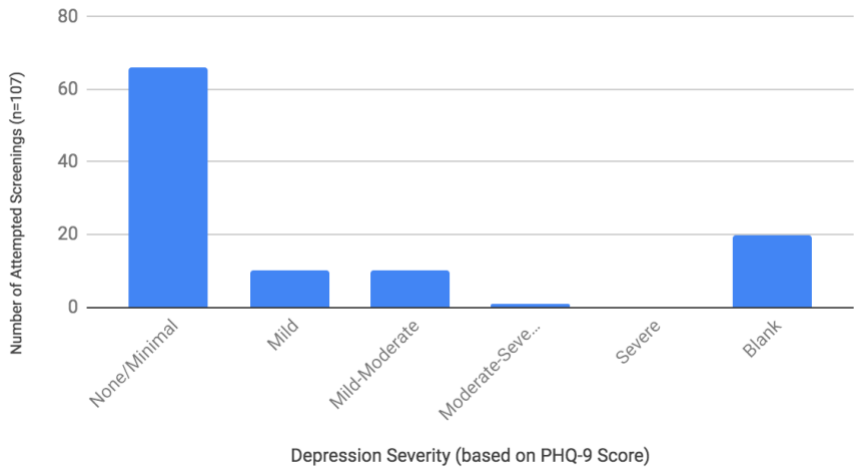

Figure 9. Frequency by Depression Severity (n=107)

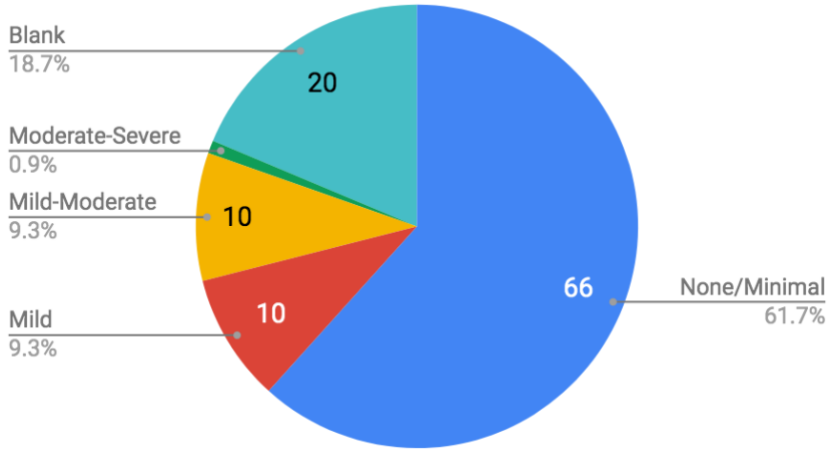

Figure 10. Percentage by Depression Severity (n=107)

At the project's end, more than 50% of HF patients scheduled during the project pilot period were screened for depression. For patients who scored equal to or greater than 10, the provider attempted to validate the patient's score by inquiring about his/her feelings and the degree of impact that depression had on their day-to-day activities. By the end of the pilot period, a total of 2 patients were referred to the Psychologist. One patient denied referral.

The project data supports the achievement of overall goals and objectives of this practice intervention. By the project's end, there was an improvement in staff knowledge about depression and depression screening in HF patients. More importantly, there was an increase in number of HF patients who were screened for depression.

CHAPTER 4: DISCUSSION

Barriers and Limitations

Limitations of this study include relatively small sample size, the use of a convenience sample, and inclusion of only English-speaking patients. Our sample consisted of more men than

women so this may underestimate the impact of depression. Studies show depression is prevalent in men and low educational levels (Son et al., 2012).

This quality improvement project provides an assessment of depression in HF patients however, conclusions from our data may not reflect the true prevalence of clinical depression. Detecting mild depressive disorders are challenging because patients may not feel comfortable sharing these psychosocial concerns due to the negative stigma and attitudes associated with depression. Depressed patients might have been less willing than non-depressed patients to participate in this study, resulting in an underestimate of the prevalence of clinical depression. Time constraints attributable to short patient visit times and busy provider schedules were another limitation to the study as 18% of attempted screenings were incomplete at the project's end.

Conclusion

In conclusion, developing a process for depression screening and management is an important aspect of care when managing patients with chronic diseases such as heart failure. Thoughts and emotions are a physical, chemical-embodied manifestation that affects the body as a whole. Modern medicine tends to divide the body into parts however, attention to how the mind and body are interconnected can allow healing to start. This evidence-based research project has brought some insight to the role of depression in patients with HF. Future research should include NYHA classes as disease severity is linked to depression prevalence. Subsequent efforts should also be made to evaluate the inpatient HF population for depression, as there may be more substantial prevalence and severity of depression. More importantly, health

policies should include establishing appropriate behavioral health resources and interventions when a patient tests positive for depression at the moderate and severe levels.

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Appendix A
Pre and Post Test for Staff

Circle: MD/APRN RN MA Front Desk

1. How long does it typically take to complete the PHQ-9 survey?
   A. 10-20 seconds
   B. 1-3 minutes
   C. 5-7 minutes
   D. 10-12 minutes

2. Patients with heart failure and depression are at a 2 to 3 times increased risk for morbidity and mortality, compared to non-depressed patients with heart failure.
   A. True
   B. False

3. Depression is _____ and _____ in heart failure patients.
   A. Under-recognized and under-treated
   B. Over-recognized and over-treated
   C. Under-recognized and over-treated
   D. Over-recognized and under-treated

4. Based on the American Heart Association recommendations, how often should patients with chronic heart diseases be screened for depression?
   A. Every doctor's visit
   B. Once a month
   C. Once a year
   D. Never

5. Patients with advanced heart failure and untreated depression are at risk for which of the following:
   A. Poorer health outcomes and quality of life
   B. Decrease adherence to medical treatment
   C. Frequent hospitalizations
   D. All of the above

6. After the patient completes the PHQ-9, who is responsible for calculating the total score?
   A. Physician
   B. Nurse Practitioner
   C. Medical Assistant
   D. Front Desk Secretary

7. A PHQ-9 score of 12 indicates what level of depression severity?
   A. Mild
   B. Moderate
   C. Severe

8. Which patient is qualified to participate in this quality improvement project?
   A. Patient with acute diastolic heart failure, does not understand or speak English.
   B. Patient with atrial fibrillation, has never been diagnosed with heart failure.
   C. Patient with congestive heart failure and a past history of severe depression.
   D. **Patient with advanced heart failure, speaks and understands English, has no history of depression or mental health problems.**

9. Possible long-term benefits of appropriate screening and management of depression in heart failure patients:
   A. Improve patient outcomes and quality of life
   B. Decrease hospitalizations and readmission rates
   C. Enhance mood and psychological well-being.
   D. All of the above

Appendix B
PHQ-9 Screening Tool

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

NAME:_____ DATE:_____

*Providers Name: _____

Over the last *2 weeks,* how often have you been bothered by any of the following problems?

Circle the number that indicates your answer

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite – being so figety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3

SKIP THIS PART → add columns _____ + _____ + _____

TOTAL: _____

10. If you checked off *any problems,* how *difficult* have these problems made it for you to do your work, take care of things at home, or get along with other people?

- Not difficult at all _____
- Somewhat difficult _____
- Very difficult _____
- Extremely difficult _____

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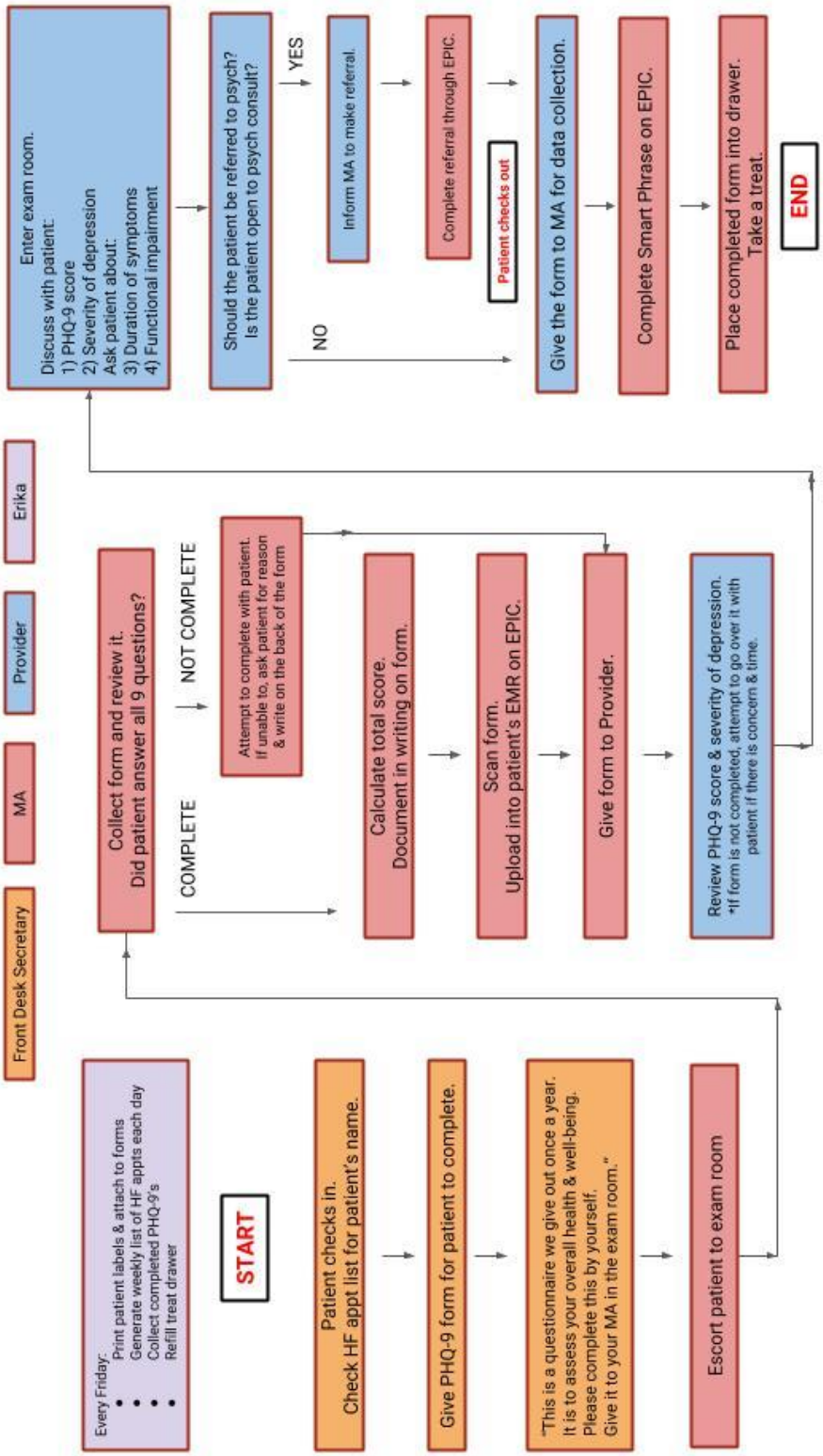
Appendix C
Gantt Chart: Project Timeline

TASK	2018									2019				
	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Submit Ch. 1-3 to committee														
Proposal Defense														
Brief key leaders & staff														
Collect pre-test														
Train staff														
Collect post-test														
Create PHQ-9 algorithm & office flow sheet														
Modify algorithm & flow sheet														
Pilot Practice Change														
Implement practice change														
Collect data														
Analyze data														
Interpret data														
Submit final paper to committee														
Final Defense														
Graduation														

Appendix D
Office Flowchart



Appendix E
PHQ-9 Score & Proposed Treatment/Management Action