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Final DNP Project Report

Evaluation of Depression Screening Implementation in the Adult Inpatient Heart Failure
Population: A Process Outcomes Evaluation

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University of Kentucky

College of Nursing

Fall, 2017

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Dedication

This and the entirety of my work to complete the DNP journey is dedicated to my son, Paul. For half of my son's life I have been working full time and pursuing this Doctor of Nursing Practice degree. Now as the end of this journey draws near I look back with love and appreciation for my son's sacrifice. It was not a sacrifice that he made willingly but one that I chose for him. When he is a grown man my hope is that he will look back with pride for what his mother has achieved. I hope that he will know, whole-heartedly, that I did it all for him, to teach him the benefit of hard work and sacrifice, and to never give up no matter how hard something may seem at the time. The worrying is always worse than the doing, just keep doing.

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A very personal recognition goes to Lauren Knight and Cat Tomes. These two extraordinary women have been by my side from when I was contemplating applying for this program and they will be there to celebrate with me when it is complete. They have been there to support me at my weakest moments and have encouraged me every step of the way. They are my greatest cheerleaders and truest friends, there are no words to do my gratitude for them justice.

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heart failure population: a process outcomes evaluation

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Abstract

BACKGROUND: Extensive study has found depression in heart failure (HF) patients to be a significant risk factor which has been associated with poor outcomes and increased medical cost for this population. It is highly recommended to screen HF patients for depression to identify this important risk factor. The PHQ-9 depression screening instrument (sensitivity 70% specificity 92%) has been identified as a valid measure to detect depression in the HF population. Implementing a depression screening protocol in an inpatient environment requires education of providers to establish awareness of best practice and foster confidence in their application of the screening instrument. **OBJECTIVE:** To determine if a correlation exists between provider knowledge of depression screening in the HF population, and adherence to a depression screening protocol. **METHODS:** A literature review was conducted to determine appropriate depression screening instruments for use in the HF population. Results were utilized to develop an education plan with pre-posttest, and depression screening protocol for implementation. A pilot study was conducted in the critical care unit of Norton Brownsboro Hospital (NBH) from September 27, 2017 through October 30, 2017. **RESULTS:** Adherence to the screening protocol was 40.6 percent. Pre-post assessment of provider knowledge following provider education was correct and unchanged for three out of four knowledge items. Significant ($P < .05$) increase of knowledge ($P = .002$) for the remaining item. Perceptions of the burden of untreated/undetected depression in the HF population increased significantly ($P = .001$, $P = .04$, $P = .09$).

CONCLUSIONS: No association between knowledge and adherence to a depression screening protocol was found. Provider knowledge showed significant increase after an education intervention. These results indicate that more is required beyond effective education of providers to achieve the goal of depression screening in the inpatient HF population.

Background

Heart failure (HF) is a life-threatening condition where the heart can no longer pump blood effectively to the body. HF is a chronic disease that effects 5.7 million people in the U.S., it is a contributing cause to one out of every nine deaths annually in the U.S.; an estimated 20-40% of people with a diagnosis of heart failure have depression as a comorbidity (Mbakwen, Aina, & Amadi, 2016). Heart disease is the leading cause of disability in the U.S. (CDC, 2011). Depression is prevalent in populations with chronic diseases; more specifically depression has been found to be independently associated with poor outcomes, specifically risk of readmission, in the elderly heart failure population (Freedland et al., 2016). In chronically ill patients, self-efficacy is identified as being one of the strongest predictors of health-promoting behaviors and is influenced by factors such as social support and depression (Maeda, Shen, Schwarz, Farrell, & Mallon, 2013). Physiologic factors of depression such as lethargy and motor retardation along with psychological factors such as pessimism and low self-esteem contribute to poor self-efficacy behavior in HF patients with comorbid depression leading to nonadherence to HF management and consequential rehospitalization (Maeda et al., 2013).

Both prevalence and cost of care for HF in the U.S. are expected to increase greatly due to the aging population; it is estimated that by 2030 more than 8 million Americans will have HF with total costs increasing from \$31 billion, in 2012, to \$70 billion by the year 2030 (Heidenreich et al., 2013). Similarly, in 2016, the American Heart Association (AHA) commissioned a study to project the burden of cardiovascular disease through the year 2035 (AHA, 2017). The report prepared by RTI International projects an estimated 8.8 million Americans with HF by the year 2035 and a rise in total cost from \$29 billion, in 2015, to \$64 billion by 2035 (Khavjou, Phelps, & Leib, 2016).

Prior to recent updates, HF guidelines in the U.S. were adopted, in part, from the Scottish Intercollegiate Guidelines Network (SIGN) HF guidelines that were published in 2007, these guidelines do not specify depression screening as a necessary measure (SIGN, 2007). Since that time, SIGN has updated their guidelines to include depression screening in the management of HF, however, they do not recommend a single preferred screening instrument or treatment approach once depression has been identified (SIGN, 2016). In April 2017, a focused update of HF management guidelines was published by the American College of Cardiology (ACC), the AHA Task Force on Clinical Practice Guidelines, and the Heart Failure Society of America (HFSA). This update also fails to include depression screening as a necessary measure in the management of HF (Yancy et al., 2017). The US Preventive Services Task Force (USPSTF) has issued recommendations to screen all adult patients for depression, stating that the harm in doing so is “small to none” (Sui, 2016). HF patients with depression should be comprehensively identified due to their increased risk for poor outcomes (Rustad, Stern, Hebert, & Musselman, 2013).

Screening Instruments

To choose an appropriate depression screening instrument for use in the HF population, a literature review was completed. A search of current evidence was done utilizing Medline, PubMed, Ebscohost, and CINAHL databases using the terms: depression, heart failure, depression screening, depression screening instruments, comorbid depression, readmission, and rehospitalization. Results were limited to publications within the past 10 years, English language, and age 18+.

A total of 9 studies met criteria for review. Rapid appraisal tools were used to verify the quality of chosen studies and each were found to be reasonable choices for inclusion. This was

determined by evaluating conflicts of interest and statistical evidence, specifically validity and reliability of instruments. Strength and quality of the 9 chosen pieces of evidence are as follows: III-A (4), III-B (2), IV-A (2), IV-B; evidence was evaluated using the Johns Hopkins rating scheme (Newhouse et al., 2005).

The literature review provided evidence that dimensional screening instruments (BDI, GDS, HADS, CES-D, DMI-10/18, Zung Depression Scale, Hospital Anxiety and Depression Index, PHQ-2, PROMIS, Medical Outcome Survey-Depression Instrument) detect higher rates of depressive symptoms where categoric instruments (DIS, CDS) rely on the precision of the interviewer to be reliable (Johansson, Dahlstrom, & Brostrom, 2006). The challenge in choosing a screening instrument for this population is compounded by overlapping symptoms such as fatigue and loss of appetite which could be attributed to either depression or HF. The evidence revealed that the GDS, BDI, CES-D, HADI, Medical Outcome Survey-Depression Instrument, and Zung Depression Scale are all poor instruments for detecting overlap of somatic depressive symptoms and physical cardiac symptoms (Delville & Mcdougall, 2008; Haworth, Moniz-Cook, Clark, Wang, & Cleland, 2007; Johnson et al., 2012).

With the goal of applying use of the chosen instrument in the inpatient setting, ease of use is also a factor to examine. The DIS and CDS are instruments that are highly valid and reliable however they each require dedicated time and precision for accuracy and would therefore be inappropriate for bedside use by staff nurses (Delville & Mcdougall, 2008; Haworth et al., 2007; Ski, Thompson, Hare, Stewart, & Watson, 2012). The remaining evaluated instruments, PROMIS- Depression Short Form, PHQ-2, HADS, DMI 10/18 and PHQ-9, vary in length and have proved to be valid and reliable (Fischer et al., 2013; Hammash et al., 2012; Hilton et al., 2006; Smith, 2010). Of those instruments the PHQ-9 is selected for its ease of use,

in both the outpatient and inpatient setting, and proven ability to detect depression in the adult HF population.

The PHQ-9 depression screening instrument is both categorical and dimensional and is a solid choice considering that it can be used in both inpatient and outpatient settings, as it can be provider driven or used in patient self-reporting (Hammash et al., 2012). In a paper reviewing 8 separate depression screening instruments the PHQ and BDI were determined to be superior to others, however the BDI has already been ruled out for the HF population as it has poor ability to discern overlap of symptoms (Ceccarini, Manzoni, & Castelnuovo, 2014).

After reviewing the literature, the PHQ-9 appears to be a valid instrument for depression screening in the inpatient HF population. The implementation of depression screening would apply to all adult HF patients who are admitted to the inpatient setting. There is evidence to support the use of PHQ-9 screening in the hospitalized HF population; research has found positive screening to be associated with an increased 4-year all-cause mortality in patients with systolic heart failure specifically (Deveney, Belnap, Mazumdar, & Rollman, 2016).

The PHQ-9 is practical and valid for the purpose of this study; it has already been chosen by Norton Healthcare for use in the stroke patient population and is built into the organization's electronic medical record (EMR) system; it can be added to the chart of any patient admitted to a Norton Healthcare facility. Proven to be valid and reliable the PI has chosen to use the PHQ-9 depression screening instrument for the adult inpatient HF population (Hammash et al., 2012).

Purpose

The specific aim of this study is to evaluate the adherence of staff nurses to a new depression screening protocol for the adult inpatient HF population within NBH ICU 3E and 5W, following an education intervention. This pilot study aims to identify if there is a correlation

between an education intervention and adherence to a screening protocol. The following four research questions guided this project.

1. What perceptions do providers hold regarding HF and comorbid depression?
2. Are providers knowledgeable about the use of the PHQ-9 depression screening instrument?
3. Is there a correlation between education about HF with comorbid depression and depression screening in the critical care setting?

Methods

This project utilized a descriptive quasi-experimental, post-test only evaluation of adherence to depression screening in the adult ICU inpatient HF population. This study was designed to measure the adherence rate of NBH ICU staff nurses to newly implemented depression screening protocol of ICU inpatients, with new or pre-existing diagnosis of HF, using the PHQ-9 depression screening instrument after an education intervention. Additionally, this study evaluated staff nursing knowledge and perceptions of depression screening using pre/post assessment.

Education of the ICU staff nurses about PHQ-9 depression screening within the adult inpatient HF population as well as use of the PHQ-9 in Epic was provided in face to face education sessions, via email and through educational fliers which were posted throughout staff common areas. A baseline/pre-assessment of knowledge and perception concerning depression screening (Appendix A) and demographic questionnaire were collected after participant recruitment and consent. After receiving education, participating nurses were instructed to utilize

the PHQ-9 for any patient they cared for, in the ICU, who had a new or preexisting diagnosis of HF.

A retrospective electronic medical record review was conducted, after patient discharge from the unit and at the end of the study period, to evaluate the number of ICU patients, with a new or pre-existing diagnosis of HF, who was screened for depression appropriately by participating nurse. A post-assessment was given to, and completed by, the consented participating staff nurses at the conclusion of the study period to evaluate for a change in knowledge and perception of depression screening from baseline measure.

Setting

The Norton Healthcare (NH) system is the largest in the Louisville, KY region and includes five main hospitals and many urgent care centers offering the residents of Kentucky and Southern Indiana a full range of medical services. Norton Brownsboro Hospital (NBH) is a 175-bed community hospital located in Jefferson County, Kentucky. NBH is one of four hospitals within the Norton Healthcare systems that serve adult patients. Consisting of 30 beds the ICU at NBH is a collective force of nurses and managers who work between the units of 3 East and 5 West. The NBH ICU serves patients admitted with neurologic/neurosurgical, cardiac, pulmonary, medical, surgical and renal critical care needs among others. The study time frame was from September 27, 2017 through October 30, 2017.

Sample

The study sample consisted of a primary population of providers and a secondary population of HF patients. The primary population for this study includes NBH ICU staff nurses who agreed to participate in education sessions and depression screening intervention. Up to

approximately 76 staff nurses within the NBH ICU were invited to participate. NBH staff nurses who decline participation were excluded from this study resulting in a total primary population of 33 providers. All participants are ADN or BSN educated nurses, as this is standing criteria for employment as a staff nurse in the unit where the study took place. All ethnicities were included. Agency employed nurses who do not regularly work in NBH ICU were excluded.

The secondary population consists of adult patients, aged 18 years and older, admitted to the Norton Brownsboro ICU with a new or existing diagnosis of HF during the study period. All ethnicities are included. This population was to be screened for depression using the PHQ-9 depression screening instrument by participating nurses.

Data Collection

Approvals from the University of Kentucky Institutional Review Board (IRB) and the Norton Healthcare Office of Research and Administration (NHORA) were obtained prior to implementation and the collection of data. Patient charts were obtained from the NBH electronic patient database. Charts were identified using the ICD-10 codes associated with any HF diagnosis during the study period, this was done by the Norton Healthcare data specialists in the Health Information Technologies (HIT) department (Table 1). During data collection, patient records were accessed using the patient medical record numbers (MRN) provided by HIT specialist. A total of 1,012 patient MRNs were returned, eliminating those patients who were seen on an outpatient basis reduced the number of MRNs to 157. The primary investigator (PI) entered each of the remaining 157 medical records to assess if the patient had been in NBH's ICU during their hospitalization and if the patient had been under the care of one or more participating providers. A final yield of 34 MRN's met study criteria for further review. Of those, two were omitted as those patients were admitted with a stroke diagnosis and were

therefore screened for depression according to the mandatory protocol already in place. A total of 32 MRN's were utilized for uses in data analysis.

Provider data for analysis consisted of demographic variables: age, education, years nursing experience, years ICU nursing experience, gender, ethnicity, and pre/post knowledge and perception assessments. Data obtained from chart review of the secondary population includes: number of providers who cared for patient, depression screening completion status, and documented reason if screening not completed.

Data Analysis

Descriptive statistics, including means, frequency distribution, and SD were used to describe patients' demographic characteristics. McNemar's test was used to test for differences pre-post for knowledge. Paired t-test was used to differentiate pre-post assessment of perception of comorbid depression in HF. All analysis was conducted using Statistical Package for the Social Sciences (SPSS) version 23; a level of $P < .05$ was used for statistical significance throughout.

Results

The provider sample demographic characteristics as to age, sex, ethnicity, education level, and nursing experience can be seen in Table 2. Posttest knowledge remained unchanged aside from one item. A marked increase of provider knowledge ($P = .002$) was noted regarding the time sensitivity of the PHQ-9 to detect depressive symptoms (Table 3). Both pre- and post-test of perception indicates that the participants agree to strongly agree with the three items, however posttest indicates a significant increase ($P = .001$, $P = .04$) in the level of agreement that

Undetected/Untreated depression is both a problem and has a negative impact on the overall health of HF patients (Table 4).

Analysis of chart data revealed that among those who were screened, patients were in the care of an average of 1.6 nurses (SD=2.1, range= 0-6) prior to being screened. Of those who were not screened, patients were in the care of an average of 3.2 nurses (SD=4.2, range=0-19) prior to being screened. Depression screening adherence was at 40.6%. However, for those HF patients who were screened for depression it is noted that the patient was in the care of an average of 1.6 (SD= 2.1, range 0-6) participating providers prior to being screened. Non-adherence was at 59.4%; for those not screened it is noted that those patients were in the care of an average of 3.2 (SD= 4.2, range 1-19) participating providers prior to discharge from ICU.

Discussion

This study aimed to determine if a correlation exists between education/knowledge of the burdens of comorbid depression in the HF population and adherence to a depression screening protocol for that population. Findings from this study suggest that there is not a correlation between knowledge and adherence to depression screening for an adult inpatient ICU population.

Despite significant evidence of improved knowledge and increased sensitivity to the burden of comorbid depression in HF patients, non-adherence to a depression screening protocol existed even when patients were screened. This is evidenced by the number of participating providers who cared for the patient prior to the completion of depression screening; out of the 40.6% of the secondary population who were screened for depression, an average of 1.6 participating providers failed to complete depression screening before another provider followed the study protocol. HF patients who were screened for depression according to the study

protocol were missed by anywhere from 1 to 6 providers who had volunteered to participate in this study before a different participating provider followed protocol. Only 1 participating provider documented a reason for depression screening not being completed, the cited reason indicated that the patient had been discharged and readmitted as a Hosparus patient. As for the 53.8% of the secondary population who were completely missed by the protocol, they were missed by an average of 3.2 participating providers, anywhere from 1 to 19. Of note, one HF patient was under the care of 19 different voluntary participating providers without being screened for depression OR having a documented reason for depression screening not being completed.

Prevention is key to improve and preserve population health. The medical consequence of failing to identify those HF patients at with increased risk of poor outcomes due to comorbid depression is that providers then miss the opportunity to offer and explore treatment options that may improve outcomes. It is important to note that the study unit at NBH does have a PHQ-9 depression screening protocol in place for the stroke population, the adherence to depression screening related to that protocol is 95%; patients who screen positive have results forwarded to their attending physician who then can plan care accordingly (Lindsey R. Siewert, R.N., Neuroscience Clinical Nurse Specialist and stroke coordinator at NBH, personal communication December 1, 2017). It stands to reason that a HF specific depression screening protocol could be equally adhered to, if made a standardized requirement.

Limitations

The limitations of this study include small sample of participating nurse providers, making results less reliable for generalizability. Implementation results may be different if the conducted with a larger provider population. Pilot period duration was also a

limitation. A longer duration may have changed adherence data and/or perceptions of providers. Implementation of the pilot protocol in a single unit was a limitation. Adherence and perceptions may have resulted differently had this protocol been implemented across multiple sites. Additionally, this study is limited by the poor generalizability of results due to the study unit itself. The study unit was chosen due to its lower acuity level of cardiac patients as compared to other critical care units within Norton Healthcare, allowing for contact with HF patients prior to their being lost to discharge.

Recommendations for Future Study

To further assess what steps are necessary to comprehensively identify HF patients with comorbid depression, a large scale multi-unit, multi-level comparison study that includes evaluation of factors that contribute to non-adherence of voluntary providers is recommended. In the course of this study it was found that limited evidence exists concerning the treatment of depression in the HF population. More research is needed to investigate what care pathways are most effective in this population. Furthermore, research should be focused according to HF classifications, as needs and functional ability vary with severity of disease. Investigation of what steps are currently being taken by physicians and APRNs when depression is identified in the inpatient HF population.

Conclusion

Recommendations to screen the adult population for depression have been issued by USPSTF and recommendations to screen for depression the HF population have been found in international HF guidelines and current research [(Siu, 2016); (SIGN 2016); (Rustad et al., 2013)]. The US Guidelines have yet to adopt this measure as a requirement (Yancy et al., 2017).

Is this because the evidence for the most appropriate and effective treatment is lacking? Or is it because the resources are not in place to manage the burden of treatment that comes with identification of the problem?

In the absence of standardized U.S. guidelines that call for depression screening, this study aimed to determine if a correlation exists between knowledge and sensitivity to the burden of HF with coexisting depression and adherence to a pilot depression screening protocol. Despite increased sensitivity in the perception of depression as a burdensome healthcare factor in the HF population poor adherence to the pilot protocol resulted.

HF is a complex health issue that contributes a massive burden on the healthcare community (AHA, 2017). An important and pervasive contributor to the poor outcomes associated with HF has been identified as worsening symptoms of depression (Sherwood, Andrew, Blumenthal, James & Hinderliter, 2011). We have valid and reliable instruments to identify depression in HF patients.

The healthcare community continues to search for the most appropriate and agreed upon treatment for depression in the HF population. There is evidence to suggest that cognitive behavioral therapy (CBT) targeted towards depression and HF self-care is effective for depression but not for HF self-care or physical functioning; however other benefits result, such as reduced anxiety and fatigue, improved social functioning, and better quality of life as related to health (O'Malley, 2015). Further evidence asserts that there is limited evidence specific to the treatment of depression in the HF population but supports CBT and pharmacologics such as selective serotonin reuptake inhibitors (SSRIs), as safe and effective for the reduction of depressive symptom severity in cardiovascular patients (Rustad et al., 2013).

In the absence of official US Guideline recommendations that call for screening of all HF patients for depression, healthcare facilities can incorporate a standardized screening protocol to identify depression in the adult inpatient HF population so that treatment decisions can be made.

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Table 1. Inclusion List of Heart Failure ICD-10 Codes

Inclusion Criteria List of Heart Failure ICD-10 Codes	
ICD-10 Codes	Diagnosis Definition
I11.0	Hypertensive heart disease with heart failure
I13.0	Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
I13.2	Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease
I50.20	Unspecified systolic (congestive) heart failure
I50.21	Acute systolic (congestive) heart failure
I50.22	Chronic systolic (congestive) heart failure
I50.23	Acute on chronic systolic (congestive) heart failure
I50.30	Unspecified diastolic (congestive) heart failure
I50.31	Acute diastolic (congestive) heart failure
I50.32	Chronic diastolic (congestive) heart failure
I50.33	Acute on chronic diastolic (congestive) heart failure
I50.41	Acute combined systolic (congestive) and diastolic (congestive) heart failure
I50.42	Chronic combined systolic (congestive) and diastolic (congestive) heart failure
I50.43	Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure
I50.9	Heart failure, unspecified
I42.90	Cardiomyopathy

Table 2. Nurse Participant Demographics n=33

	Mean (SD) or n (%)
Age	34.9 (9.7)
Education	
ADN	6 (18%)
BSN	27 (82%)
Years experience as a nurse	7.2 (8.7)
Years experience as an ICU nurse	6 (8.1)
Gender	
Female	24 (73%)
Male	9 (27%)
Race	
Black or African American	1 (3%)
Caucasian	30 (91%)
American Indian/ Alaskan Native	0
Asian	0
Hispanic	2 (6%)

Table 3. Pre-post Knowledge Assessment n=33

	Pre % correct	Post % correct	<i>p</i>
The PHQ-9 tool is used to assess for what condition? <i>Depression</i>	100%	100%	NA
How do you access the PHQ-9 tool for patient assessment? <i>Flowsheets</i>	100%	100%	NA
The PHQ-9 monitors for symptoms of depression that have been present for: 2 Weeks	46%	85%	.002
Symptoms of depression have no effect on self-efficacy or adherence to medical treatment. <i>False</i>	98%	98%	NA

Table 4. Pre-post Perception Assessment of Untreated/ Undetected Depression n=33

	Pre Mean (SD)	Post Mean (SD)	<i>p</i>
Is a problem in the heart failure patient population	2.1 (1.1)	1.4 (0.7)	.001
Negatively impacts the overall health of individual heart failure patients	1.8 (1.3)	1.4 (0.7)	.04
Negatively impacts medical compliance of individual heart failure patients	1.9 (1.3)	1.4 (0.7)	.09

Appendix A

Assessment of Knowledge

1. The PHQ-9 tool is used to assess for what condition?
 - a. Obstructive sleep apnea
 - b. Suicide risk
 - c. **Depression**
 - d. AMI risk
2. How do you access the PHQ-9 tool for patient assessment?
 - a. Navigator
 - b. Chart Review
 - c. Results Review
 - d. **Flowsheets**
3. The PHQ-9 monitors for symptoms of depression that have been present for:
 - a. 1-month
 - b. 1-week
 - c. 2-months
 - d. **2-weeks**
4. Symptoms of depression have no effect on self-efficacy or adherence to medical treatment.
 - a. True
 - b. **False**

How strongly do you agree or disagree with each of the following:

1-Strongly agree

2- Agree

3- Neither agree nor disagree

4- Disagree

5- Strongly disagree

Untreated/undetected depression:

a. Is a problem in the heart failure patient population? 1 2 3 4 5

b. Negatively impacts the overall health of individual heart failure patients? 1 2 3 4 5

c. Negatively impacts medical compliance of individual heart failure patients? 1 2 3 4 5