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The Effectiveness of Screening for Comorbid Depression Among Outpatients With Chronic Diseases in Maryland

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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Walden University
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Abstract

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Project Submitted in Partial Fulfillment of

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Abstract

Depression is a pervasive mental health disorder worldwide. Although being diagnosed with chronic illness exacerbates susceptibility to depression, detection and subsequent treatment of comorbid depression in primary care settings remain suboptimal because patients with chronic medical disorders are not commonly screened for depression. There is a need to initiate proactive measures by implementing routine screening in primary care settings. The plan-do-study-act (PDSA) model guided an intervention to establish a depression screening practice. This study aimed to determine if the implementation of evidence-based screening for depression using the Patient Health Questionnaire-9 (PHQ-9) tool could increase diagnosis of comorbid depression among patients suffering from chronic diseases. Convenience sampling served as the method for selecting healthcare records that met the predetermined criteria. Two hundred established patients over 18 years of age were screened for depression at a primary care clinic in Maryland within a 10-week period following *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) criteria. Study participants included 84 (42%) males and 116 (58%) females. Of these, 84 (42%) had minimal depression, 57 (29%) had mild depression, 23 (12%) had moderate depression, 24 (12%) had moderate-severe depression, and 12 (6%) had severe depression. The baseline report from the clinic revealed 0% depression screening practices yet the post-project chart review revealed a surprisingly high rate of depression diagnosis in 34 (17%) of 200 patients suffering from chronic illnesses. Identification of a reliable tool that would be used to screen depression among patients with chronic diseases at primary care clinics to mitigate the deleterious effects of depression and promote the well-being and health of patients and their families is important.

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Dedication

This research work is dedicated to my parents Mobolaji and Shola Hassan for their inspiration and immense support. The sacrifices they have made throughout my studies and their continuous encouragement have brought me this far. They have always believed in my academic potential, and this encouraged me to complete my studies to accomplish my goals. Mum, Dad, you two are my biggest pride!

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Section 1: Introduction

People who live with chronic illnesses make many adjustments to their lives because chronic diseases can limit their independence, and mobility. They become less active and more dependent on others for activities of daily living (Fegg, Kraus, Graw, & Bausewein, 2015). Chronic diseases that are associated with depression include cancer, stroke, heart problems, diabetes, and osteoporosis (Fegg et al., 2015). Consequently, it is crucial that chronic disease management is improved by integrating screening of depression.

The World Health Organization (WHO) claimed that mental disorders including depression are global health problems (Thapar et al., 2012). The WHO further predicted that by 2030, depression would be a causative factor in more years of life lost due to disability than any other type of health condition. Early detection of depression is critical because of the heavy burden of suffering that accompanies it. Sometimes, depression ends in suicide. There is an emerging bidirectional relationship between depression and chronic illness. Comorbid depression does lead to functional impairment, and poor outcomes (Thapar et al., 2012). Comorbid depression can invoke feelings of hopelessness and helplessness, which can sap the motivation of patients to care for themselves.

Depressed patients are less likely to adhere to treatment regimens and often end up with incomplete recovery (Culpepper, Muskin, & Stahl, 2015). As such, an evidence-based depression screening tool, the Patient Health Questionnaire-9 (PHQ-9), was introduced and served as an integral part of the initial encounter with patients suffering from chronic illness at a designated primary care clinic. The significant prevalence of depression in patients who have chronic diseases suggested that this is a disorder with the

potential to impact the medical outcomes of these patients negatively (Culpepper et al., 2015). According to findings of research by Kang et al. (2015), the depression rate among patients suffering from chronic diseases is significantly higher than that of their counterparts who do not suffer from such diseases. The use of an evidence-based screening tool with excellent sensitivity such as the PHQ-9 represents a significant step toward identifying patients with chronic diseases who are suffering from depression. Currently, depression is the second leading cause of disability, adjusted in life years, among individuals aged between 15 and 44 years (Voinov, Richie, & Bailey, 2013). Depression shortens life expectancy by 25 to 30 years (WHO, 2014). It is evident that this health condition can be identified through screening to reduce the risk of disabilities that accompanies it. The condition can be identified and treated in primary health care settings using antidepressants and psychotherapy regimens that have been reported to be effective 80% of the time (WHO, 2012).

This project highlights the importance of depression screening tools in primary care and the need to implement a routine screening for depression among patients with chronic illnesses. The goal is to reduce the problem of undiagnosed depression in primary care settings. This study not only encourages screening and detection of depression as a comorbid condition among individuals with chronic diseases but also encourages (PCPs) to discuss the results of such screenings with identified participants and proceed with the next intervention to improve patient outcomes; while increasing the number of patients receiving treatment in primary care settings.

Problem Statement

Depression is a widespread mental health ailment across the world (WHO, 2014). It is also a leading causative factor for disability. This quality improvement project was conducted at a suburban primary care clinic located in the eastern region of Maryland. The average resident at this location was more at risk of suffering from chronic diseases compared to the national average because of disparities in access to health care services and preventive resources (National Institute of Mental Health, 2017). Research indicates that there is a 15.6% risk of depression among individuals with chronic conditions such as asthma, chronic obstructive pulmonary disease (COPD), arthritis, heart disease, and osteoporosis (Bhattacharya, Shen, & Sambamoorthi, 2014). Maryland is in the second unhealthiest region in the United States (Maryland Department of Health, n.d.). The adjusted rate of cardiovascular disease in Maryland by race is 50.3 per 100,000 populations among African American men, 45.2 among African American women, 34.8 among Caucasian women, and 33.5 among Caucasian men (Maryland Department of Health, n.d.). The adjusted rate for cancer for the entire state among all races is 449.8 per 100,000 populations; among males of all races, it is 507.5 (Community Care of North Carolina, 2015). The adjusted rate for colorectal cancer for the whole state is 14.9; among men, it is 21.1, and among women, it is 12.5 (Community Care of North Carolina, 2015).

The National Institute of Mental Health (2017) has endorsed integrated care for mental health into primary care settings because individuals with mental disorders have higher rates of chronic physical illnesses. People are more likely to visit a primary care setting than a mental health system. If mental disorders are routinely screened for in

primary care settings, PCPs can provide care for conditions such as depression and anxiety.

Research has confirmed the claims of the U.S. Preventive Services Task Force (USPSTF) that screening improves the accuracy of detection of depression in primary care settings (Siu, 2016). The USPSTF further reported that nine clinical trials were conducted that addressed screening in adults, with results adequate to establish the benefits of the treatment of depression (e.g., initiating antidepressants and psychotherapy). Screening for depression was found to significantly improve overall health outcomes (Culpepper et al., 2015).

The quality improvement project holds significance for nursing practice. Due to the increase of health care coverage through the affordable health care program, many patients view primary care clinics as more convenient and reasonable than going to the emergency room (U.S. Preventive Services Task Force, 2014). Thus, introducing routine depression screening practice in this primary care setting was ideal for this population. Patients diagnosed with chronic diseases such as cancer, hypertension, stroke, arthritis, diabetes, heart disease, and chronic lung disease are more likely to be at risk for depression than their counterparts (Wu, 2013).

With the introduction of an evidence-based depression screening tool at the designated primary care practice, the detection of depression risks in this population group was increased. The proposed routine screening practice served as an integral part of an initial encounter for patients suffering from chronic illnesses in the primary care setting. This doctoral project was necessary because research findings indicated that the number of American people receiving mental health care from PCPs was increasing

(Olsen, 2014). This doctoral project endeavored to demonstrate that there is a need to introduce screening for depression among patients with chronic diseases in primary care settings where depression screening practices are lacking.

Purpose Statement and Project Objectives

The goal of this quality improvement project was to determine if the implementation of an evidence-based depression screening tool could improve early identification and detection of comorbid depression among patients suffering from chronic diseases at a primary care clinic located in Maryland. The project applied the PDSA model as the framework to establish a routine depression screening practice in the clinic.

The project objective was to close an existing gap at the host primary care clinic in Maryland. Research showed that two-thirds of all adults seen in primary care remain undiagnosed with depression (Pence, O'Donnell, & Gaynes, 2013). This project fostered early detection of comorbid depression among patients with chronic diseases following implementation of routine screening for depression in this primary care setting. The project enhanced the roles played by nurses as leaders to bring forward screening projects in a primary care setting.

Section 2: Background and Context

Practice Knowledge Gap

This quality improvement project was conducted at a suburban primary care clinic located in the eastern region of Maryland. The clinic had primary care health personnel including a physician, a nurse practitioner, a physician assistant, a registered nurse, and three certified medical assistants. This clinic was known to offer high-quality health care services with respect, and compassion to patients and their families. The practice had been in existence for over 10 years. The clinic served its entire community, managing patients with a broad range of acute and chronic diseases. The clinic had no routine depression screening practices in place.

Despite the PCPs' expertise in managing an array of health conditions at the clinic site, their patients were not getting screened for depressive symptoms. Evidence supporting this discovery came from the clinic's data baseline report that revealed 0% of depression screening practices and the absence of depression screening documentation in electronic patient charts. It was essential to implement a reliable tool to screen depression in patients with chronic diseases at this primary care clinic. The patient population was considered vulnerable due to low educational status, financial problems, and lack of health insurance.

Research findings continue to reveal higher depression risks in individuals suffering from renal disease, heart disease, and chronic arthritic disease (Chiang, Livneh, Yen, Li, & Tsai, 2013). Even among ambulatory patients who use primary care services for health maintenance for chronic disease management, research has indicated that there

is a significantly high rate of depression that has not been diagnosed, recognized, or treated appropriately (Chiang et al., 2013).

Significance and Relevance to Practice

The primary care clinic's health personnel (a physician, a nurse practitioner, a physician assistant, a registered nurse, and three medical assistants) were involved in the screening program. Because depression is an insidious disease that can afflict anyone, participants included adults aged 18 and older in the state of Maryland. Routine screening can improve early detection, and accurate identification of individuals suffering from depression, which can reduce potential morbidity (Rankin et al., 2015). Screening can impact clinicians by helping them to identify risks and make appropriate diagnoses to initiate treatment or refer patients to proper resources, and thus improve the quality of patient care, and health outcomes in their practices.

Project Question

The project question used to guide data collection, data analysis, result examination, and outcomes was the following: In the State of Maryland, at a designated primary care clinic site, does the implementation of evidence-based screening for depression, using a PHQ-9 tool within the context of the PDSA Cycle, increase diagnosis of depression?

Evidence-Based Significance of the Project

The depression screening project used the PHQ-9 as the instrument to screen participants for depressive symptoms. The PHQ-9 is a multipurpose instrument that can be used in practice to screen and diagnose depression. It has a depression module scoring each of the nine criteria from the fourth edition of the *Diagnostic and Statistical Manual*

of Mental Disorders (DSM-IV), such as 0 -*not at all* to 3 -*nearly every day*; (Maurer, 2012). The PHQ-9 can be used to make diagnoses of depression in at-risk population groups. A score > 10 on the PHQ-9 is considered a positive screen for depression. The instrument has 61% sensitivity and 94% specificity in adults (Maurer, 2012). It was found to have good internal consistency and to be reliable and valid in prior research (Arrieta et al., 2017; Gelaye et al., 2013). The instrument was developed and assessed using traditional psychometric qualities underpinned by classical test theory (CTT; Horton & Perry, 2016).

Implications for Social Change in Practice

This project had positive implications for social change as its motive was to introduce and integrate an evidence-based routine screening for depression, which facilitated appropriate and timely diagnosis for identified patients. This social change promoted the well-being and health of the participants as well as their families and communities at large. There was a need for timely and accurate diagnosis of depression that would allow patients to have positive health outcomes and live healthy lives, in which they could contribute to their communities in many positive ways. A healthy community is a productive community.

Definition of Terms

Definitions for the medical terms used in this project were extracted from multiple sources.

Asymptomatic: Not showing any symptoms of a disease ("Asymptomatic," 2018).

Comorbid depression: Depression that develops in the presence of another illness ("Comorbid Depression," 2018).

Depression: A mood disorder that adversely affects how a person feels, thinks, and handles daily activities and social life ("Depression," 2018).

Diagnosis: The identification of illness through a screening process and examination of symptoms ("Diagnosis," 2018).

Mental disorder: A health condition in the form of a behavioral or psychological pattern that is a source of the poor ability to function ("Mental Disorder," 2018).

Plan-do-study-act (PDSA) model: A systematic series of steps used to gain valuable knowledge and skills for continuous quality improvement (Minnesota Department of Health, 2018).

Psychometrics: The psychological measurement of knowledge, attitudes, and personal traits ("Psychometrics," 2018).

Screening: A method used in a population group to investigate and detect the presence of an undiagnosed disease such as depression in a population group whose members are asymptomatic using a methodological approach and relevant tool ("Screening," 2018).

Social change: Any process that alters the behavioral patterns and cultural values of a community over time ("Social Change," 2018).

Assumptions and Limitations

The question guiding this project was as follows: In adult patients with chronic diseases at a designated primary care clinic in Maryland, will the implementation of an evidence-based depression screening tool (PHQ-9) increase the early identification of depression in patients when compared to the clinic's baseline depression screening rate before implementation of the project? The project used the depression screening tool

(PHQ-9) within the PDSA model to ascertain whether the depression screening tool's implementation would improve early identification of depression in patients in this target population group. This evidence-based practice change project helped to highlight the benefits of screening for depression at the intervention site. The project identified participants who needed a professional collaborative continuum of treatment for depression. The project confirmed that people with chronic diseases are at high risk of suffering from depression (Centers for Disease Control and Prevention, 2012).

Weaknesses and Limitations of Research Design

The evidence-based practice project was intended to increase the detection and recognition of depression in patients with chronic diseases at the designated primary care clinic. In quantitative studies, in which respondents' answer a series of questions on a questionnaire, there is usually a danger of response bias and recall bias. The use of closed-ended questions was dominant in this evidence-based practice change project. Unfortunately, closed-ended questions do not give the respondents the opportunity to express their opinions or to explain the reasons for their choice of answers. Closed-ended questions only allow participants to choose a response. This intervention program also had some limitations. Due to project time constraints, I was unable to coordinate with the clinic team to follow up with patients diagnosed with depression to determine whether the treatment that the patients received was associated with better management of their chronic conditions. Further, the limited timeframe after project completion did not allow me to collaborate with the clinic team to monitor patients' adherence to depression treatment.

Summary

Screening provides a way to recognize conditions such as depression in patients who may be asymptomatic (Thombs et al., 2012). Screening practices are necessary for realizing better patient outcomes that are possible when patients are diagnosed at a later phase of the disease. To prevent and mitigate the harmful effects of depression among people with chronic diseases, healthcare professionals need to take proactive measures to diagnose the disorder early through screening practices. Those identified to have depression can then be offered presymptomatic treatment, which reduces health care costs and increases positive outcomes (DeJean, Giacomini, Vanstone, & Brundisini, 2013). Mental disorders, including depression, cost the nation $56.0 billion annually (Taylor et al., 2015). This screening project alerted clinicians when patients' mental state was likely to affect the treatment of their chronic disease. The clinicians could then advocate for their patients and provide the necessary psychological support and other resources for them (Hinz et al., 2016). The significance of this project resides in its potential to promote accurate and prompt identification and diagnosis of depression in patients suffering from chronic diseases, which could reduce potential morbidity and associated costs. If depression is left undiagnosed, it can degenerate into a severe medical problem that can disrupt families and communities.

Section 3: Collection and Analysis of Evidence

Review of Scholarly Evidence

The general health of an individual relies heavily on the individual's psychological and mental health condition. Over the last few decades, it has increasingly appeared that there is an association between chronic disease and the development of depression (Keshavarz et al., 2013). This claim has attracted the attention of many researchers who have examined and analyzed the few prior research studies that have been conducted to validate this claim; this project was a result of such an examination (Keshavarz et al., 2013). It is noteworthy that the review and evaluation of prior research have focused on scrutinizing studies about the lack of screening for depression in primary care settings.

Keshavarz et al. (2013) endeavored to conduct a meta-analysis of research carried out between 1994 and 2012 retrieved from databases such as MEDLINE, PsycINFO, Cochrane Central Register of Controlled Trials, and Cochrane Database of Systematic Reviews. The purpose of the study was to establish the benefits of screening for depression in average population groups. The conclusion of the meta-analysis underscored a dire need to increase early diagnosis of depression and follow-up treatment for those diagnosed with the disease as well as those most likely to be affected by it. Though the authors had trouble finding studies revealing evidence of the benefits of screening, they identified five studies as eligible for their meta-analysis, which made their study of great importance. It added to and highlighted an aspect of health care that seemed to be marginalized or less explored. Although the studies that Keshavarz et al.

identified had few participants, their meta-analysis served to create interest in investigating the problem further.

Crogan and Evans (2012) responded to the need for research to reveal benefits of screening for depression among the chronically ill. A two-group prospective quasi-experimental research study was conducted among long-term-care adults who had multiple chronic diseases. The study was a comparative study of the elderly in long-term care who underwent routine screening for depression every 6 months and those who were only receiving routine care in facilities without being screened for depression. A total of 81 residents were recruited for the study. Forty of the residents formed a group whose members had never been screened for depression, and the rest were from facilities where they were assessed every 6 months. Participants' levels of depression were measured using the Geriatric Depression Scale, which is used to assess depression in older adults who have mild and moderate cognitive impairment.

Studies revealed that among the group whose members underwent period screening, the diagnosis of depression decreased from 46% to 29% (Keshavarz et al., 2013). In a similar group that underwent period screening, the Geriatric Depression Scale found that there was only a 9.4% decrease in depression among the elderly (Keshavarz et al., 2013). These results shed light on the efficacy of regular screening for depression as far as reducing levels of depression is concerned. In cases where there is routine screening for depression, more cases are identified, which lowers the levels of unidentified or undiagnosed depression. It confirms the need for regular screening, particularly among vulnerable population groups likely to suffer from chronic diseases. Regular screening for depression can result in considerable percentages of people having

access to treatment. The weakness of the study is that the sample size was small, and the results might not be generalizable to the rest of the community. Moreover, it was conducted among residents of facilities that differ from primary care settings. Application of the findings to the general public should be done with caution.

It is not known which chronic diseases are more associated with the development of depression. In an effort to address this knowledge gap, Wu (2014) conducted a descriptive cross-sectional study of 310 individuals suffering from chronic metabolic syndrome to measure the efficacy of screening for depression. Wu used questionnaires such as the WHO-5 and PHQ-2 scales. Self-administered questionnaires were used to collect data on psychological indices and biochemical tests from respondents. The results from the WHO-5 showed that 5% of the participants had depressive symptoms and 1.0% were confirmed depression cases (Wu, 2014). The PHQ-2, when administered to the same participants, revealed that 4.8% had depression (Crogan & Evans, 2012). These findings confirm not only the validity of the tools used to screen for depression but also the need for routine screening to identify people suffering from depression so that they can be placed in appropriate treatment. It is impossible to give patients treatment for depression if they have not been diagnosed. Untreated depression can have tragic consequences. The bottom line is that there is a need for sustained screening for depression in populations whose members are at high risk for depression. This is the reason that this project is of utmost relevance and importance.

Concepts

Chronic Pain

Pain that emanates from chronic disease can impair activities of daily living and interrupt productivity and social life (Banhato, Galil, Campos, Colugnati, & Richter, 2016). Chronic pain can be a source of insomnia, poor nutrition, and poor appetite (Banhato et al., 2016). These factors can lead to depression in patients. Banhato et al. (2016) conducted a study among 1,558 participants with multiple chronic conditions at a center for management of chronic diseases such as diabetes and chronic kidney diseases in Brazil. The study was an attempt to substantiate the potential correlation between chronic illness and depression. The study was prompted by an underdiagnosed number of cases of depression likely to develop among people with chronic health conditions. The authors used a PHQ-2 tool. The research assistants administered the questionnaire to participants, and no incentive was given to the participants for their time. Their eligibility was determined by the WHO definition of chronic disease.

The findings by Banhato et al. (2016) suggested a positive correlation between suffering from chronic illness and reporting depressive symptoms. It is noteworthy that this study did not rely on the DSM-IV for diagnosis of depression. Instead, Banhato et al. used epidemiological screen scales. It is necessary to use the DSM-IV to diagnose depressive symptoms because this can function as a guideline for determining a treatment regimen. To diagnose depression without the prospect of treating it is counterproductive. This current research study indicated that depressive symptoms could remain undiagnosed and untreated for people with chronic diseases unless a screening program is established. Efforts to train health care professionals to identify depressive symptoms

accurately among vulnerable population groups and design appropriate treatment procedures should precede this.

Chronic Diseases and Comorbid Conditions

To explore the findings regarding the association between chronic diseases and depression risk several studies have been conducted. One such study was by Gerontoukou, Michaelidoy, Rekleiti, and Saridi (2015) who conducted an investigative study among 204 patients living in urban areas. These patients underwent treatment at a local hospital and were visiting outpatient clinics at that hospital. Gerontoukou et al. sought to determine their levels of anxiety and depression and to establish a correlation between the results and the patients' daily activities. The sample consisted of people who were suffering from hypertension, diabetes, and hypercholesterolemia. The instrumentation used in the study was the Greek version of the Zung Self-Rating Depression Scale for assessment of depressive symptoms due to its reported high sensitivity, specificity, and repeatability (Gerontoukou et al., 2015). Furthermore, the Greek version of the Delusions-Symptoms-States Inventory State of Anxiety and Depression Scale (DSSI/sAD) by Bedford, Foulds, and Sheffield (1976) was used in this investigative study to assess the level of anxiety and depression of participants. The results of the study revealed that 35% of the participants were diagnosed with depression and 56% of them were diagnosed with anxiety (Gerontoukou et al., 2015). These results indicate a correlation between chronic disease and psychological disorders such as depression and anxiety, suggesting that chronic illness does trigger these conditions. The U.S. Preventive Services Task Force (2016) has urged health care professionals to routinely screen adult populations for depression. Healthcare professionals need to start

paying attention to individuals suffering from chronic illnesses as far as depression and other psychological conditions are concerned so that those conditions can be treated before they progress into potentially tragic developments.

Conceptual Models and Theoretical Frameworks

The evidence-based practice model for this improvement project was the PDSA model using the PHQ-9 self-reported questionnaire (Institute for Healthcare Improvement, 2018). There are four stages in the PDSA model: plan, do, study, and act (Institute for Healthcare Improvement, 2018). The use of the PDSA model encouraged the drive to integrate screening practices as part of the clinic's first encounter with patients with chronic diseases. The planning phase entailed identification of patients with a major depressive disorder, the type of data collected (mild to severe depressive symptoms), how data were gathered (PHQ-9), who collected data (the clinic team), when data were collected (when patients were waiting to be seen by their primary care provider (PCP), and the location where data were gathered in the assigned examination room (Institute for Healthcare Improvement, 2018). I initiated this project in collaboration with the clinicians of the host primary care setting and rest of the primary care team.

Another goal of this evidence-based practice change project was to use this model as a guide to establish a screening practice for comorbid depression at this intervention site for patients with chronic diseases to screen and identify depression early. The PDSA model was chosen for this project because of its versatility. PDSA provides a straightforward and iterative approach to healthcare delivery practice for quality improvement. The model provides a framework that can be adopted by any practice regardless of its resources or size. The PDSA model has been chosen and used

successfully in many healthcare organizations in which it has served to accelerate change and improve quality (Institute for Healthcare Improvement, 2018).

The PDSA model is also known as the *Deming wheel* or *Deming cycle*. This concept was first developed by and introduced to Deming by his mentor, Walter Shewhart, of the famous Bell Laboratories in New York (Deming Institute, 2016).

Approach/Methodology

This quality improvement project was conducted in a suburban primary care clinic located in the eastern region of Maryland. The population was mostly African American, Indian, and Caucasian. The clinic did not have any patients who required bilingual services. Several patients who received care at the clinic received state-run health care insurance through the state of Maryland. The clinic was open Monday through Friday and provided primary care services to all age groups, with patients ranging from the pediatric to the geriatric population. The health care providers at the clinic included a physician, a nurse practitioner, a physician assistant, a registered nurse, and three medical assistants.

Project Design/Methods

For this DNP project, the clinic team appointed one of the medical staff members as the data manager. The data manager was responsible for the review of patients' medical records, data collection for the project, and data storage. Before the start of the project, baseline rates of depression screening and diagnosis were obtained by the data manager from the electronic medical record. The data manager conducted a retroactive electronic chart review on patients 18 years of age and older who had at least one chronic disease. These patients needed to have received medical care at the intervention site

within a year prior to project initiation. The deidentified data after data collection were provided to me for data analysis.

Before initiating the screening project, I conducted a 30-minute educational gathering with the appointed clinical staff, who were called the *questionnaire administrators* (a physician, a nurse practitioner, a physician assistant, a registered nurse, and three medical assistants). The session included discussion of the project and its purpose and the team's obligations, which included administering and scoring the PHQ-9 (Appendix C). The data manager scanned all completed questionnaires in patients' respective medical records, and all PHQ scores were documented electronically. Positive questionnaire scores (PHQ-9 $\geq$ 10) were given to PCPs, who discussed the results with participants.

I received authorization from the host clinic's Institutional Review Board (IRB) as shown in Appendix B to access and analyze internal, deidentified site records deemed suitable solely for the doctoral project. I was responsible for conforming with the host clinic management's internal policies and requirements as they related to access and use of deidentified site data for the depression screening program. I applied to the Walden University IRB for project approval before initiation of the project at the intervention site. Patients who met the criteria to participate in the project received an informed consent document with the demographic questionnaire (Appendix D). The demographic questionnaire included gender, age, race and ethnicity, marital status, education level, and yearly income. To maintain patient confidentiality, the data manager used the last four digits of the patients' medical record numbers rather than patient names for data collection. Once the project had been initiated by the clinic team, the data manager

collected all the deidentified data and kept it locked in a secure drawer within a secured room until the end of the screening project. All completed forms were scanned into the patients' electronic health records by the data manager. Moreover, all paper data were kept in a secured locker within a secured room for a period of 6 to 9 months and were shredded onsite after the entire project was completed and data analysis was finalized by me.

Population and Sampling

To meet project inclusion criteria, individuals needed to be patients aged 18 years or older who received regular medical care at the primary care clinic and who had a diagnosis of one or more chronic diseases. Additionally, participants must not have received a previous diagnosis of depression. Convenience sampling served as the method for selecting healthcare records that met the predetermined criteria.

Depression Toolkit

The PHQ-9 guideline by the New York State Department of Health is a national guideline that was introduced to the PCPs to determine participants' severity of depressive symptoms (AmeriHealth Caritas Louisiana, 2013). According to the New York State Department of Health (2016), no permission is required to use the PHQ-9 guidelines for health change interventions or programs. With this national guideline, the PCP could set up a follow-up visit to confirm the diagnosis, discuss treatment options, or/and refer the patient to a mental health specialist. This guideline was not expected to substitute for the provider's clinical judgment; it only represented a source of guidance in addition to the provider's clinical judgment.

Data Collection Process

Instrumentation

Appendix C shows the instrument used for this project, the Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 is a depression module that includes nine questions. Scores for the nine questions range from 0 to 27. The questions are answered by following the DSM-IV criteria from 0 (*not at all*) to 3 (*nearly every day*). The total scores determine the severity of depressive symptoms. The PHQ-9 scores are summed to indicate the aggregate levels of depression:

- 0-4: None
- 5-9: Mild depression
- 10-14: Moderate depression
- 15-19: Moderately severe depression
- 20-27: Severe depression

Based on the scores, the questionnaire administrators identified positively screened patients to their PCPs. The target for a positive screen was a PHQ-9 score of $\geq$ 10. Participants with PHQ-9 scores of 10 or higher were considered positive for clinically significant depression. A PHQ-9 score of 10 or higher required a follow-up visit to confirm the diagnosis and discuss the need for treatment with the PCP.

The PHQ-9 is reported to function well when used to screen for depressive symptoms in patients with chronic diseases (Hinz et al., 2016). Fann et al. (2005) stated that regression coefficients were applied to analyze collected data. The PHQ-9 has been shown to have 61% sensitivity and 94% specificity when used in adults (Fann et al., 2005). The PHQ-9 has been tested in a broad range of populations and deemed to be a

reliable and valid instrument (American Psychological Association, 2017; Chen et al., 2016; Spitzer, Williams, & Kroenke, 2014). The PHQ-9 was developed and assessed using the traditional psychometric qualities underpinned by CTT (DeVellis, 2006). DeVellis (2006) defined CTT as a method that is broadly used for constructing as well as evaluating rating scales. The validity of the PHQ-9 instrument has also been established in research studies, which have included eight primary care settings and seven obstetrical clinics (Gelaye et al., 2013). The PHQ-9 instrument has been identified as a reliable and valid tool with remarkable sensitivity and specificity scores (Gelaye et al., 2013). Additionally, an item-response theory method to evaluate psychometric properties of the PHQ-9 was used to evaluate its psychometric properties as an instrument for measuring depression (Gelaye et al., 2013). Their findings established that the instrument is a reliable means for assessing depression.

Ethics and Human Subjects Protection

Permission was granted by the Walden University IRB (Appendix A) and the clinic site (Appendix B) to proceed with data collection. The participants that were involved in the study were all adults, aged 18 and older, who had at least one chronic disease or more. These patients must have received medical care at the intervention site within a year period of project initiation. Participants signed a consent form that explained the objectives of the study, its Risks and benefits, study confidentiality, participant rights, and information with which to contact the clinic for any further questions or clarifications. During the data collection process, the questionnaire administrators respected the participants by observing their right to participate in the program voluntarily. The depression screening project was explained to the participants

extensively to reduce any anxiety or negative feelings among them. The reasons for conducting the program at the clinic were fully explained to them. The questionnaire administrators applied necessary steps to protect the participants from any breach of confidentiality during the data collection process by using the last four digits of the participants' medical record number. There was need for participants to share their personal information regarding symptoms of depression, all the deidentified data was kept locked in a secure drawer within a secured room until the end of the screening project. After the completion of the data collection process, all completed forms were scanned into the patient's electronic health records by the data manager. Moreover, all paper data was kept in a secured locker within a secured room for a period of 6 to 9 months until the entire project was completed, and data analysis has been finalized by me. Participants' confidentiality and anonymity were safeguarded using the health care delivery protocol. The program was conducted in a manner that posed no risk to the participants.

Procedure Details for Collecting Data

The data collection process began immediately after I had secured a letter of cooperation from the designated primary care practice where the depression screening program was conducted, and from Walden University's IRB. The depression screening procedure was carried out in the examination room while the participant was waiting to be seen by their PCP. The questionnaire administrators informed those that were enrolled in the program about the purpose of the program to help them understand the significance of their participation in the program. In the examination room, the questionnaire administrator administered the PHQ-9 individually to those participants that met the

criteria for the program. Before the participants started responding to the questionnaire, they were asked to read the entire consent form and to indicate that they understood it before signing it as a way of indicating their willingness to participate, voluntarily without coercion (University of California, Irvine, 2015).

The participants were also encouraged to take note of any concerns about items in the PHQ-9 and were given feedback on any uncertain areas of the questionnaire for clarity and understanding. The questionnaire administrators further indicated to the participants that if they wished to withdraw from participating in the program, they could do so without fear of reprisals from the clinic staff. The participants were then given a copy of the PHQ-9 to complete. The participants were instructed to circle their responses in the form of numerical scores. The questionnaire administrators calculated the score for each item on the PHQ-9 after the completion of the PHQ-9 form by each participant. The data manager and the practicum preceptor were involved in the implementation of the DNP project; they provided needed explanations and clarifications to facilitate completion of the PHQ-9 questionnaire by the participants. The data manager oversaw all data, and the practicum preceptor (a physician) monitored and supervised the data collection process while I coordinated the program.

Data Analysis

After data collection, I was handed de-identified data for data analysis. Descriptive statistics were conducted to report the demographic characteristics, the prevalence of the PHQ-9 symptoms and how the depression severity symptoms correlate with gender. The scores of the PHQ-9 scale were cross-tabulated to report association among elevated PHQ-9 scores, categorized chronic illnesses and how those factors

interrelate with gender and the daily functionality of the participants. Certain chronic medical conditions and participants that scored 10 or higher on the PHQ-9 scale were examined to see if there is any contribution to gender. This report guided the PCPs to be more cognizant of the signs of depression when caring for this susceptible group.

A total of 200 participants were asked to participate in the depression screening program at the primary care clinic. As shown in Appendix D, the demographic characteristics were age, gender, ethnicity, marital status, level of education, and yearly income. The age ranges of the sample were 18 and over. Eighty-four (42%) of the participants were male and116 were female (58%). There were 109 Caucasians, 75 African Americans, 3 Hispanics, and 13 participants categorized as other (Appendix G). More than 50% of the sample had an education level of high school and below (Appendix G). Over 50% had an annual income lower than $30,000 (Appendix G). Table G1 provides demographic data regarding the participants who were screened.

Table G2 reports the prevalence of depression severity symptoms by gender. The results from this analyzed data demonstrated that 42% (n=84) of the participants had minimal depression, 29% (n=57) of the participants had mild depression, 12% (n=23) had moderate depression, another 12% (n=24) had moderate-severe depression and 6% (12) had severe depression. Apparently, the result illustrated that the more chronic diseases the participants suffered from, the more elevated their PHQ-9 scores and the more severe their depressive symptoms.

The other data provided by the participants came from their responses to the nine items in the PHQ-9 that measured the symptoms of depression using score columns for all nine items on the PHQ-9 scale on Table G3. There is one specific item number on the

PHQ-9 scale under which most participants who had more than one chronic condition fall. The item question on the PHQ-9 scale was "Trouble falling/staying asleep/sleeping too much." Almost half of the participants screened (n= 98) from a total of 200 participants acknowledged the presence of this symptom in their daily life (Table G3).

Table G4 revealed that 0% of depression screening practices and the absence of depression screening documentation in the patients' electronic charts. The post-project chart review finding as shown in Table G5 revealed a surprisingly high rate of depression diagnosis (17%) in a small sample as small as 200 patients suffering from chronic illnesses. Fifteen percent of them were started on antidepressants (Table G5). The DNP project depression screening program underscores the importance of focusing on mental illness by integrating screening for depression in primary care settings.

The 200 participants were asked to report how difficult it was to function with the problems that they were experiencing daily. As shown in Table G6, of the 200 participants, 75 (38%) self-reported "*Not difficult at all*," 73 (36%) reported "*Somewhat difficult*," 35 (17%) reported "*very difficult*" and 17 (9%) "*extremely difficult*" (Table G6).

Table G7 showed the association between specific medical conditions and how it was related to gender. The chronic diseases that were examined included: diabetes, hypertension, heart disease, kidney disease, COPD/asthma, arthritis, and dyslipidemia. Other chronic diseases were fibromyalgia, thyroid conditions, multiple sclerosis, cancer, and psychiatric disorders. Table G7 revealed that many participants were primarily affected by diabetes (14.5%), dyslipidemia (29.5%), arthritis (18%), and by other chronic conditions (19%) as mentioned above.

Many of the participants with one to two chronic conditions scored lower on the PHQ-9 scale compared to participants that had two or more chronic illnesses. As shown in Table G8, out of the 84 male participants that were screened for depression, a total of 43 male participants were identified to have more than two chronic medical conditions, out of those 43 male participants, almost half of the participants self-reported a PHQ-9 higher than 10. Likewise, for the female participants on Table G9. Out of the 116 female participants that were screened for depression, a total of 72 female participants were identified to have more than two chronic medical conditions. Out of those 72 female participants, 37 participants which accounts for more than half of those screened self-reported a PHQ-9 higher than 10 (Table G9).

Project Evaluation Plan

This primary care clinic offered an exceptional privilege to introduce and integrate an evidence-based quality improvement program to screen out patients who are at risk of depression. The goal of this program was to implement an evidence-based depression tool in this primary care setting for all patients with one or more chronic diseases presenting to the clinic for primary care services. As such, there was a paucity of research on routine screening for depression among the general adult population. This project attempted to bridge this gap.

A strategy used in this project toward improving outcomes and quality of health care for this project was an interdisciplinary teamwork approach. The clinic team assumed full responsibility for this screening program to administer, score, and interpret results of the assessment tool, including diagnosis, treatment options, and referrals. The scope of this screening project was to implement change by initiating an assessment tool

at the primary care clinic to identify depression early in patients who had chronic diseases. The intention was to establish a depression screening procedure at the clinic site using the PDSA model as a framework to initiate quality improvement process (Donnelly & Kirk, 2015). The PCPs discussed the PHQ-9 scores with all identified patients who had positive screens (PHQ-9 scores > 10) and then intervened accordingly. The interdisciplinary team approach involved a partnership with other healthcare professionals, in this case, mental health specialists, PCPs with other health support personnel, which formed a community of health care providers to address the mental health issue. This collaboration promoted depression management programs. Prior research in randomized clinical trials has revealed that individuals with medical comorbidities do benefit from screening for depression so that their depression can be proactively managed using integrated care methods (Coventry, Lovell, Dickens, & Bower, 2015).

A Cochrane review that involved 79 randomized clinical controlled trials found that collaborative care is more effective than the usual care for depression (Archer, Bower, Gilbody, & Lovell, 2012). This project was of benefit to the clinic because it provided ideas and information for expanding services to include routine depression screening. It encouraged and developed the interdisciplinary relationships with other healthcare professionals, such as mental health professionals and chronic disease specialists. The introduction of screening for depression risks was also used as a quality measure for the clinic.

The state of Maryland has established the Center for Community Collaboration through which the state has designed a program known as screening, brief intervention,

and referral to treatment (SBIRT), which is focused on dissemination of screening, brief intervention, and referral to treatment for mental disorders that include depression. However, the screening process remains alarmingly low in the primary care settings in this state. Thus, the need for projects such as this doctoral project continues to sensitize the primary care health community to the necessity of screening for mental disorders.

The retention of accurate research data and findings was significant because these screening data could be used to answer questions about the phenomenon being examined. They could also be used to answer the project question and to identify areas of further research and to frame new techniques and approaches to improve health practice.

Summary

Depression is a pervasive mental health disorder across the world. In the United States, depression accounts for 3.7% of all U.S. disability-adjusted life years and 8.3% of all U.S. years lived with disability (National Institute of Mental Health, 2015). Depression is also a leading causative factor for disability. Research has demonstrated that being diagnosed with chronic illnesses can exacerbate susceptibility to depression (Unützer & Park, 2012). The Taylor et al. (2015) claim that despite the significant prevalence of depression in the United States, the detection and subsequent treatment of comorbid depression in primary care settings remains suboptimal. In the state of Maryland, 3.0% of all adults are reported to have depressive symptoms each year (Hedden et al., 2015). That is, about 130,000 people have depressive symptoms each year and this does not include asymptomatic individuals (Hedden et al., 2015). Apparently, there is need to initiate proactive measures by implementing routine screening in primary care settings. As previously reported, current literature indicates that screening improves

detection, diagnosis, treatment outcomes (Culpepper et al., 2015). This project endeavored to improve early detection of depression among patients with chronic diseases in a primary care setting to pave the way for proactive management of depression using integrated care method.

Section 4: Findings and Recommendations

Introduction

Depression is a widespread mental health condition across the world (WHO, 2014). It is a leading causative factor for disability (Maryland Department of Health and Mental Hygiene, 2014). The doctoral project was conducted at a suburban primary care clinic located in the eastern part of Maryland. The average resident at this location was at greater risk for suffering from chronic diseases compared to the national average because of disparities in access to health care services and preventive resources (Maryland Department of Health and Mental Hygiene, 2014).

According to the Maryland Department of Health and Mental Hygiene (2014), in the state of Maryland, 3.0% of all adults are reported to have depressive symptoms each year. That is, about 130,000 people have depressive symptoms each year (Hedden et al., 2015). This figure does not include asymptomatic individuals. There is a need to initiate proactive measures by introducing and implementing a depression screening tool at the designated primary care clinic. Current literature indicates that screening improves detection, diagnosis, and treatment outcomes (Culpepper et al., 2015). This project involved an effort to implement early detection of depression among patients with chronic diseases in a primary care setting to pave the way for proactive management of depression using integrated health care methods.

Research indicates that there is a 15.6% risk of depression among individuals with chronic conditions such as asthma, COPD, arthritis, heart disease, and osteoporosis (Bhattacharya et al., 2014). Maryland is in the second unhealthiest region in the United States (Maryland Department of Health, n.d.). The adjusted rate of cardiovascular disease

in Maryland by race is 50.3% for African American men, 45.2% for African American women, 34.8% for Caucasian women, and 33.5% for Caucasian men (Maryland Department of Health, n.d.).

The DNP project's objective was to close the existing gap in the delivery of primary care services, which has mostly excluded screening for depression at the practicum site, a primary care clinic located in Maryland. Research shows that two-thirds of adults seen in primary care remain undiagnosed with depression (Pence, O'Donnell, & Gaynes, 2013). This project fostered early detection of comorbid depression among patients with chronic diseases following the implementation of routine screening for depression at this primary care setting. The project enhanced the roles played by nurses as leaders to bring forward screening procedures in primary care settings.

The clinic had no routine depression screening practices in place at baseline. Despite the PCPs' expertise in managing an array of health conditions at the clinic site, there was an absence of screening for depressive symptoms. The evidence came from the clinic's data, as presented in a baseline report that revealed 0% for depression screening practices and the absence of depression screening documentation in electronic medical charts. In light of this information, it was important to identify a reliable tool that would be used to screen depression among patients with chronic diseases at this primary care clinic.

Project Summary and Evaluation Report

PCPs are skilled in managing various diseases in their practices. However, their patients are often not screened for depression; this lack of screening represents a significant gap in the healthcare delivery system. The results of the program can be used

not only to encourage other PCPs to adopt integration of routine screening for depression but also to lobby for more aggressive depression screening policy guidelines and to make depression a priority preventive practice in the healthcare industry. Because of the evidence obtained from the depression screening program, other PCPs will be motivated to become significant advocates for screening and for promoting depression awareness in their practices and communities. As an evaluator for the depression screening program at the designated primary care clinic, I supervised and functioned within the context of the PDSA model and ensured that all cycles of the model were completed to evaluate the effectiveness of the model (Moore et al., 2014). The program evaluation process involved synthesizing information about the data collection activities and outcomes of the program to evaluate the program's effectiveness and make improvements (Moore et al., 2014).

Furthermore, the evaluation process helped assess the impact of the depression screening program on the target population group. As an evaluator, the depression screening program was also assessed to confirm that the program was in alignment with the purpose for which it was designed. This means that the PDSA model was used to guide the questionnaire administrators to promote quality improvement (QI) at the primary care clinic.

The PDSA model diagram (Appendix E) is structured in such a way that it tests a change that is implemented. It does this through four prescribed steps that guide it and break down the task of accomplishing the specified steps (Taylor et al., 2015). As shown in Appendix E, the PDSA model was chosen for that purpose, as it focused on the root of change and the translation of the intervention (Reed & Card, 2015). The PDSA model is very appropriate for QI interventions that involve testing changes (Taylor et al., 2015).

Plan

At this initial stage, the few clinical staff were appointed as "questionnaire administrators." I conducted a 30-minute in-service session with the appointed staff to educate them on depression screening program details, the PHQ-9, the PDSA model, and the program's purpose, objectives, and goals. The DNP student reinforced and clarified what each staff member's duties were to ensure that all appointed staff were aware of their roles in relation to the depression screening project.

Do

At this stage, the actual data collection process was conducted. Participants were screened in the examination room while they were waiting to be seen by their PCP. I continued to collaborate with the appointed staff and ensured that all activities were reviewed and monitored. This helped in pinpointing deficiencies so that improvements could be made when needed. All activities of the entire program were examined and evaluated. The screening process constituted the "study" part of the model.

Study

During this stage, I reviewed the objectives and purposes of the depression screening program as well as information gathered from preceding phases to determine whether the program resulted in the anticipated improvement and whether the entire project was worth the effort and investment required. I assessed activities of the program through the data manager. One of the challenges was to determine the best way to distribute the questionnaires while maintaining the confidentiality of the participants. The clinic team was advised by me to put the questionnaires in a manila envelope before giving them out to the participants. Some participants had low literacy skills; they had

trouble understanding what the questions meant. That issue was addressed by assisting those participants with reading the questions, as well as simplifying the questions so that they would not feel uncomfortable due to their inability to read and understand the PHQ-9 (Appendix C). Furthermore, the questionnaire administrators came across some participants who were identified as positive screenings for depression (PHQ-9 scores $\geq$ 10). Those participants were counselled on depression, and benefits of follow-up care were discussed with them for proper evaluation.

After data collection, the data manager handed over 200 completed PHQ-9 forms with deidentified coded data to me after which I evaluated the data. The descriptive statistical analysis was conducted to determine how effective the PHQ-9 is as a depression screening tool. All information obtained was used as part of the evaluation process to address all unanticipated problems.

Act

At this phase of the program, I reviewed the entire program using the PDSA model to note where improvement was needed. Some recommendations were made to the clinical staff because the screening process will be an ongoing process as the program continues following the implementation of the depression screening intervention. The leaders of the primary care clinic are considering adopting this change into the practice. The clinic staff plan to screen for depression at least once a year for all returning patients; all new patients will be screened during their first visit to the clinic. The PDSA model will continue to improve quality through this project at this intervention site regarding screening for comorbid depression. Additionally, the staff at the intervention site may make changes to the program that has been implemented.

Summary and Evaluation of Findings

PCPs are in optimal positions to screen, identify, diagnose, treat, follow up with and refer patients to psychotherapy counselling or psychiatrists. The depression screening intervention was conducted in a designated primary care setting. The PHQ-9 was used to obtain data from the patient participants regarding depression and provided a means of scoring patients' depressive status. Descriptive data analysis was conducted by me to provide evidence for the findings. Other data that were gathered included participants' ethnicity, gender, age, level of education, marital status, and income level. The depression screening intervention was implemented among 200 patients at a designated primary care clinic in Maryland. After the participants signed the consent form indicating their willingness to participate in the program, a questionnaire was distributed to them. After clinic registration, the PHQ-9 (Appendix C) from the New York State Department of Health (2016) was administered to patients who consented to participate. According to the depression toolkit (Appendix F), scores of 0 to 4 on the instrument meant that individuals had minimal depressive symptoms and needed no intervention (see Appendix F). Questionnaire scores of 5 to 9 were indicative of mild depression; in such cases, patients needed to be watched closely in case the condition progressed (Appendix F). No psychotherapy was needed at this stage. Scores of 10 to 14 suggested moderate depression. A score of 15 to 19 suggested a diagnosis of moderately severe depression (Appendix F). Scores of 20-27 indicated severe depression (Appendix F).

Discussion of Findings

Depression is recognized as a major health problem that impacts both the mental and physical health of people living with chronic diseases. This DNP project generated

more evidence to support the need for regular screening for diagnosis and treatment of depression among patients suffering from chronic diseases. The PHQ-9, which is a depression module that includes nine questions, was manually completed by participants, who circled their responses in the form of numerical scores. The questionnaire administrators (a physician—practicum preceptor, a nurse practitioner, a physician assistant, a registered nurse, and three medical assistants) provided needed explanations and clarifications to facilitate completion of the PHQ-9 questionnaire by the participants. The questionnaire administrators calculated a score for each item after each participant's completion of the PHQ-9 form. The completed forms were scanned into the patient's electronic health record, and the PHQ-9 scores were documented electronically by the data manager. These scores were used as measures to help in understanding depression outcomes for better monitoring and treatment of depression.

This project functioned to create awareness among PCPs of the importance of identifying and treating depression in patients suffering from chronic diseases and to ensure that depressive symptoms are reduced and better managed. The PCPs in the study were in optimal positions to screen, identify, diagnose, treat, follow up with, and refer patients to psychotherapy counseling or psychiatrists. No permission is required to use the PHQ-9 guidelines for health change interventions or programs. Total PHQ-9 scores determine the severity of depressive symptoms. The PHQ-9 scores were summed to indicate aggregate levels of depression, as follows: 0-4: none, 5-9: mild depression, 10-14: moderate depression, 15-19: moderately severe depression, and 20-27: severe depression. The depression severity symptoms findings in this study reveal that 42% (n = 84) of the participants had minimal depression, 29% (n = 57) had mild depression, 12%

(n = 23) had moderate depression, another 12% (n = 24) had moderate-severe depression, and 6% (n = 12) had severe depression (Table G2). A very interesting finding was that the postproject chart review revealed a surprisingly high rate of depression diagnosis at 17% for such a small sample size of 200 patients suffering from chronic illnesses (Table G5).

Based on the PHQ-9 scores, patients considered positive for clinically significant depression with a PHQ-9 score $\geq$ 10 were identified by the questionnaire administrators. I provided the PCPs with a depression toolkit that contained guidelines for using the PHQ-9 from the New York State Department of Health (2016). These guidelines described various courses of action depending on patients' PHQ-9 scores. The PHQ-9 scores were translated to actual diagnoses; for example, PHQ-9 scores of 10-14 required that the PCP propose treatment and counseling to the patient, whereas PHQ-9 scores of 20-27 represented severe depression and required the PCP to pursue immediate initiation of treatment and expedite referral of the patient to a mental health facility. The patients were referred to their PCPs, who discussed the results and counseled them on depression and the benefits of follow-up care for proper evaluation. The PCPs then set up follow-up visits to confirm the diagnoses, discuss treatment options, or/and refer the patients to mental health specialists. During the follow-up visit, the PCPs discussed the PHQ-9 scores with the patients who had positive screens (PHQ-9 scores $\geq$ 10) and then advised them accordingly. The PCPs undertook an interdisciplinary team approach that involved partnerships with other healthcare professionals, including mental health specialists, to address the mental health issues, which promoted depression management programs for patients.

The scope of this DNP project encompassed implementing change through the initiation of an assessment tool at the primary care clinic that helped with the early identification of depression in patients suffering from chronic diseases. This assessment did not serve as a substitute for the patients' initial clinical judgment; it only acted to provide additional information to inform the initial clinical judgment. I pursued this study in an effort to guide the PCPs to be more cognizant of the signs of depression when caring for patients with chronic diseases because the clinic initially had no routine depression screening practices in place. Routine screening would increase rates of diagnosis and treatment of depression while contributing to patients' self-management practices.

The study findings reveal that routine screening for depression among patients suffering from chronic depression is important. The depression screening program will help PCPs realize the need for routine screening will enhance their knowledge and understanding of mental health. In addition, their healthcare practices will improve, and they will be in a position to mitigate the deleterious effects of patient depression. In realizing the need for routine screening, PCPs can become leaders in fighting morbidity and mortality associated with depression through early detection and treatment.

Implications

The unanticipated outcomes of the depression screening findings, as shown in Table G5, included a surprisingly high rate of definite depression diagnosis (17%). A total of 34 participants were newly diagnosed with depression (Table G5). A total of 30 participants (15%) were started on antidepressants (Table G5), while four participants

(2%) refused treatment and 60 participants (30%) scored 10 or greater on the PHQ-9 questionnaire and were identified as positive screens. It was surprising to see a definite depression diagnosis percentage of 17%, which was higher than the state figure of 15%. About 6% of depression diagnosis was indicated by research conducted by Bhattacharya et al. (2014). In other words, the findings of this DNP project may indicate that the percentage of depression is higher in the state than initially believed.

The high percentage of depression among the 200 participants in this DNP project suggested that there is a need to integrate screening for depression in primary care settings. The aim is to be able to identify patients with depression who need access to treatment to mitigate morbidity and enhance patient outcomes. Patients with moderately severe depressive symptoms and severe depressive symptoms need to be monitored to ensure that their condition remains under control. The successful detection of depression in the designated primary care setting is significantly important due to the complex interaction between mental and physical health. Primary care institutions, particularly those serving less advantaged communities, can serve as gateway institutions for access to collaborative care for patients.

The outcomes of the depression screening intervention show that it is possible to petition the healthcare industry to make screening for depression a standard of care. Doing so will make it easier for people suffering from depression to be screened so that depressive symptoms can be detected early, which is imperative for the development of healthy and productive communities. PCPs can help to reduce mental health disparities in the target populations and increase awareness of depression in the community. The project has positive implications for social change, in that the primary aim was to

introduce and integrate evidence-based routine screening for depression, which was introduced and facilitated appropriately in the diagnosis of identified patients. The project supports the recommendation that timely and accurate diagnosis of depression is initiated in primary care institutions to have positive health outcomes for patients with depression.

Project Strengths and Limitations

A limitation of the depression screening program is that the questionnaire administrators only used one screening instrument, the PHQ-9, for data collection. It may have been more beneficial to use more than one instrument to compare its efficacy toward detecting depressive symptoms in this and other target population.

Another limitation of the project is that our sample consisted of only 200 voluntary participants recruted from only one primary care setting as a captive sample. As such, it is not known how well the findings could be generalized to the general population at the state or national levels. Therefore, a generalization of the results should be conducted with caution. Since depression can affect memory, it is possible that some participants were not able to recall some of their symptoms. However, the PHQ-9 questions used to collect information were structured in a way that helped participants remember how they felt to provide relevant information for the project (Moore et al., 2014). Furthermore, our timeline for completing the project only permitted the appointed clinic team to implement interventions at one institution. Nevertheless, our findings have contributed to the argument that there is a need for integration of screening for depression in primary care settings. The project findings are also consistent with the literature on screening for depression in primary care (Robinson et al., 2008). By addressing these issues, the health care delivery system could improve the quality of patient-centered care

through early identification and diagnosis of depression and could improve outcomes (Robinson et al., 2008). The instrument that was used in the project has a high sensitivity and specificity and has been validated and frequently used in studies for depression screening.

On Tables G8 and G9, the tool identified patients with multiple chronic diseases to have severe depression. The more chronic diseases they had, the more they were likely to have severe depression (Walker et al., 2014). There was no statistical analysis done, only descriptive statistics. Also, there was no control group used for comparison. Hence, it was difficult to tell if there existed a statistically significant relationship. However, the following calculation was done - the mean for the prevalence of PHQ-9 symptoms among the patients ($\mu = (\Sigma Xi) /n$) was 19 for males and 32.5 for females. This means that the prevalence of PHQ-9 for depression was almost double for females compared to their male counterparts. The mode was 38 for males and 60 for females. Standard Deviation (SD) = 13.51).

Contribution of the Doctoral Project Team

I was the overseer for the implemented project at the designated primary care clinic. I worked with the questionnaire administrators of the primary care practice. The questionnaire administrators were: one physician (practicum preceptor), one nurse practitioner, a registered nurse (data manager) and three medical assistants). The appointed clinical staff known as the questionnaire administrators identified patients who were suffering from chronic diseases, met the project criteria and were willing to participate in the study. The questionnaire administrators administered both the PHQ-9 form and the demographic questionnaire (Appendix D) to the participants. The

questionnaire administrators also collected information about the gender, race or ethnicity, marital status, and race of the participants. When the participants had completed the questionnaires, they were collected and given to the project data manager for coding and storage. The project team assessed and evaluated the need for screening for depression before approving it. The data manager provided the necessary guidance and facilitation for designing and implementing the program at the designated practice, under the auspice of me and the practicum preceptor.

The implemented program should be extended beyond its current location; there is a need to reach out to other PCPs, the psychiatric community, and the mental health community to adopt the depression screening program. It will create an opportunity to work as an integrated, interdisciplinary team to encourage routine depression screening, diagnosis, and treatment, particularly among population groups suffering from chronic diseases. This way, it is possible to lobby insurance carriers to cover screening services and ensuing treatment modules.

Section 5: Analysis of Self

As a professional and doctorate nursing student leading the depression screening program at the practicum site, I served as the content expert for the program. I introduced an existing instrument, the PHQ-9 tool, to the clinic staff to screen and detect for depression symptoms. The tool guided the questionnaire administrators to collect data from patients suffering from chronic diseases. By providing scholarly and relevant information about the tool to the staff, I was able to coordinate and facilitate the implementation of the depression screening program at a designated primary care clinic located in Maryland.

Summary and Conclusions

The collaborative effort to disseminate the findings of my DNP project will target the potential adopters of the findings at the practicum site where the program was conducted. As a team, the clinic staff and I will target other primary care settings, integrated delivery systems, healthcare insurance companies, and independent practice associations. We will endeavor to disseminate these findings as a team and report evidence from the program to audiences such as healthcare professionals across the board, policymakers, and community leaders as well as psychiatry professionals using professional publications, the media, and seminars. As a team, we will also target PCP consortia.

It has been reported by the U.S. Preventive Services Task Force (2016) that depression is among the leading causes of disability among people aged 15 and above. As such, its multifaceted deleterious effects touch families, industries, and society. By considering the persistent pain associated with chronic health conditions, it becomes

necessary for nursing leaders to conduct a project that assesses the prevalence of depression among individuals suffering from chronic diseases. My implemented program indicated that there was a significant rate of depression among the population group studied. Based on the program findings, the clinic team and I believe that it is necessary for primary care practices to integrate depression screening into the primary care setting. It is essential to work closely with clinicians at the primary care clinics to disseminate the findings of the program and thus increase awareness of the need to screen for depression in people with chronic illnesses.

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Appendix A: Walden University IRB Approval

Project approval was granted by the Walden University Institutional Review Board on September 12, 2017. The approval number to proceed with the DNP Quality Improvement Evaluation is 0568309.

Appendix B: Site Approval

Site Approval Documentation for Quality Improvement Doctoral Project

[redacted]

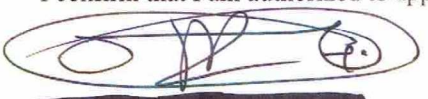
August 8, 2017

The doctoral student, [Linda Allibalogun], is involved in a Quality Improvement project at our organization, and is therefore approved to access and analyze internal, deidentified site records that I deem appropriate to release for the student's doctoral project. This approval to use our organization's data pertains only to this doctoral project and not to the student's future scholarly projects or research (which would need a separate request for approval).

I understand that, as per DNP program requirements, the student will publish a scholarly report of this QI project in ProQuest as a doctoral capstone (withholding the identity of the site).

The student will be responsible for complying with our organization's internal policies and requirements regarding access and use of site data for QI purposes.

I confirm that I am authorized to approve these activities in this setting.



[redacted]

Appendix C: PHQ-9

Patient Name _____ Date _____

1. Over the last 2 weeks, how often have you been bothered by any of the following problems? Read each item carefully and circle your response.

	Not at all	Several days	More than half the days	Nearly every day
	0	1	2	3
a. Little interest or pleasure in doing things				
b. Feeling down, depressed, or hopeless				
c. Trouble falling asleep, staying asleep, or sleeping too much				
d. Feeling tired or having little energy				
e. Poor appetite or overeating				
f. Feeling bad about yourself, feeling that you are a failure, or feeling that you have let yourself or your family down				
g. Trouble concentrating on things such as reading the newspaper or watching television				
h. Moving or speaking so slowly that other people could have noticed. Or being so fidgety or restless that you have been moving around a lot more than usual				
i. Thinking that you would be better off dead or that you want to hurt yourself in some way				
Totals				

2. If you checked off any problem on this questionnaire so far, 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
0	1	2	3

Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke, and colleagues, with an educational grant from Pfizer Inc. No permission required to reproduce, translate, display, or distribute.

Appendix D: Demographic and Background Characteristics Questionnaire

Gender: a. Male b. Female

Age: a. 18-30 b. 31-40 c. 41-50 d. 51-59
e. 60-70 f. 71+

Race and Ethnicity: a. Non-Hispanic/ Caucasian b. African American
c. Hispanic/Latino d. Other

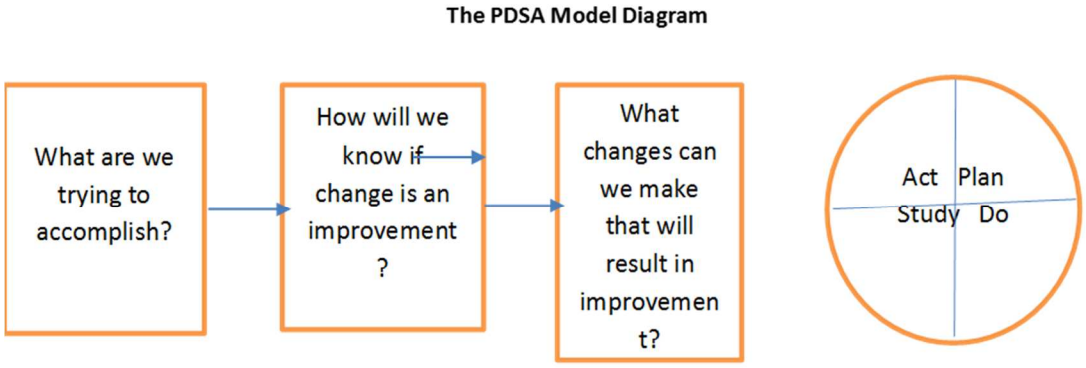
Marital Status: a. Single b. Married c. Separated
d. Widowed e. Divorced f. living together

Level of Education: a. Less than a high school diploma b. High school diploma
c. Some college or Associate's degree d. Bachelor's degree
e. Postgraduate degree

Yearly Income: a. Under $10,000 b. $10,000 - $19,999 c. $20,000 - $29,999
c. $30,000 - $39,999 d. $40,000 - $49,999 e. $50,000 - $74,999
f. $75,000 - $99,999 g. over $100,000

Medical Conditions: a. Diabetes b. Blood Pressure c. High Cholesterol
d. Kidney disease e. Heart disease f. COPD/Asthma
g. Arthritis h. Other (Circle all that apply)

Appendix E: PDSA Model Diagram



Note. This diagram was used to guide depression screening intervention and to interpret data findings to the clinic team. The PDSA diagram is in Open Access and can be accessed at any time. No permission is required to reproduce, translate, or display provided that appropriate citation is used (Perry, Bell, Fitzpatrick & Sampson, 2014). The model was also used as a framework for the project's evaluation process.

Appendix F: Depression Toolkit Contents

Guidelines for using PHQ-9 from New York State Department of Health (2016)

PHQ-9 Depression Severity Score	Proposed Treatment Actions
0-4 Minimal	No treatment recommended
5-9 Mild depression	Watch the patient closely just in case it progresses. No recommended treatment at this stage.
10-14 Moderate depression	Propose treatment and counseling
15-19 Moderately severe depression	Patient needs active treatment-pharmacotherapy and psychotherapy
20-27 Severe depression	Requiring immediate initiation of treatment; expedite referral to a mental health specialist.

(New York State Department of Health, 2016)

Appendix G: Cross-Tabulations of Descriptive Statistics Data

Table G1

Demographic Characteristics of Screened Participants

Variables	No of participants screened	Percentage
Gender		
Male	84	42%
Female	116	58%
Age	Male	Female
18-30	14	16
31-40	16	24
41-50	16	23
51-59	19	24
60-70	15	18
71+	4	11
Ethnicity	Male	Female
Caucasian	52 (26%)	57 (29%)
African American	27 (14%)	48 (24%)
Hispanic/Latino	2 (1%)	1 (< 1%)
Other	3 (2%)	10 (5%)

Table G2

Demographic Characteristics of Screened Participants

Marital status	Male	Female
Single	36	44
Married	31	42
Separated	1	9
Widowed	5	6
Divorced	7	11
Living together	4	4
Level of education	Male	Female
< High school diploma	8	12
High school diploma	45	52
Associate's degree	22	37
Bachelor's degree	7	8
Postgraduate degree	2	3
Yearly income	Male	Female
Under $10,000	13	27
$10,000 to $19,999	16	25
$20,000 to $29,999	12	19
$30,000 to $39,999	6	14
$40,000 to $49,999	13	13
$50,000 to $74,999	11	10
$75,000 to $99,999	10	3
Over $100,000	3	5

Prevalence of Depression Severity Symptoms by Gender

Table G3

Range of PHQ-9 Scores

	N (%)	Males	Females
0-4 Minimal	42%	40	44
5-9 Mild depression	29%	23	34
10-14 Moderate depression	12%	7	16
15-19 Moderately severe	12%	12	12
20-27 Severe depression	6%	2	10

Table G4

Prevalence of PHQ-9 Symptoms by Gender

PHQ-9 item	*N*	Males	Females
1. Little interest/pleasure in doing things	63	23	40
2. Feeling down/depressed/hopeless	48	14	34
3. Trouble falling/staying asleep/sleeping too much	98	38	60
4. Feeling tired/little energy	79	33	46
5. Poor appetite/overeating	62	18	44
6. Feeling bad about self/that you are a failure/ have let yourself down/let your family down	32	12	20
7. Trouble concentrating (reading newspaper or watching television)	43	17	26
8. Moving or speaking so slowly that other people notice/Or opposite: fidgety/restless/ moving around a lot more than usual	32	9	23
9. Thoughts that you would be better off dead/ or of hurting yourself in some way	6	4	2

Table G5

Preproject Chart Review (N = 200)

Number of patients screened before intervention	Number of patients screened after intervention
0	200

Table G6

Postproject Chart Review Findings: Total Participants Screened (N = 200)

No. of Patients screened	Positive PHQ-9 (score > 10)	Diagnosed with depression	Started on antidepressants
200	60 (30%)	34 (17%)	30 (15%)

Note. Four participants refused depression treatment—religion and personal reasons.

Table G7

Association Between PHQ-9 Scores and Daily Functionality

Not difficult at all	Male	Female	Total number of participants (*N*)	Percentage (%)
Somewhat difficult	32	43	75	38%
Very difficult	34	39	73	36%
Extremely difficult	14	21	35	17%
Not difficult at all	4	13	17	9%

Note. The question was "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?"

Table G8

Association Between Specific Chronic Medical Conditions and Gender (N=200)

Medical conditions	Male %	Female %
Diabetes	5%	10%
Hypertension	15%	15%
Dyslipidemia	4%	4%
Kidney disease	< 1%	1%
Heart disease	2%	2%
COPD/asthma	2%	5%
Arthritis	5%	13%
Other chronic conditions (fibromyalgia, thyroid conditions, multiple sclerosis, cancer, and psychiatric disorders)	9%	10%

Table G9

Association Between Elevated PHQ-9 Scores and Characterized Chronic Illnesses in Males

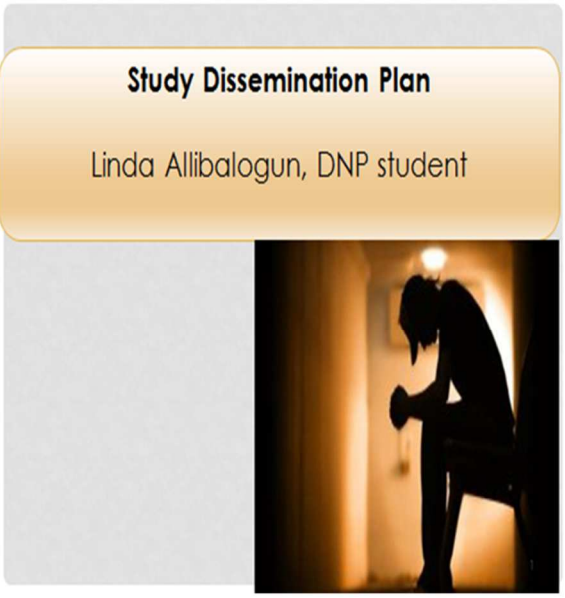
Category for comorbid chronic diseases	Male	PHQ-9 score below 10	PHQ-9 score between 10-14	PHQ-9 score between 15-19	PHQ-9 score between 20-27
1 chronic condition	41	40	1	0	0
1-3 chronic conditions	17	7	3	7	0
Over 3 chronic conditions	26	17	2	5	2

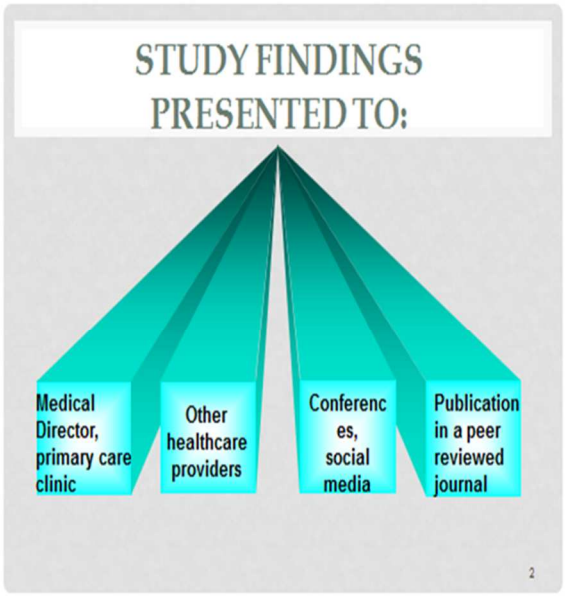
Table G10

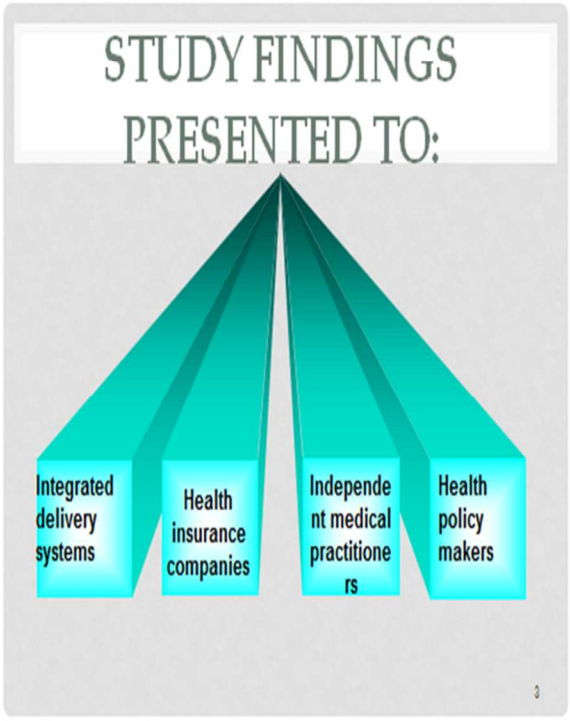
Association Between Elevated PHQ-9 Scores and Characterized Chronic Illnesses in Females

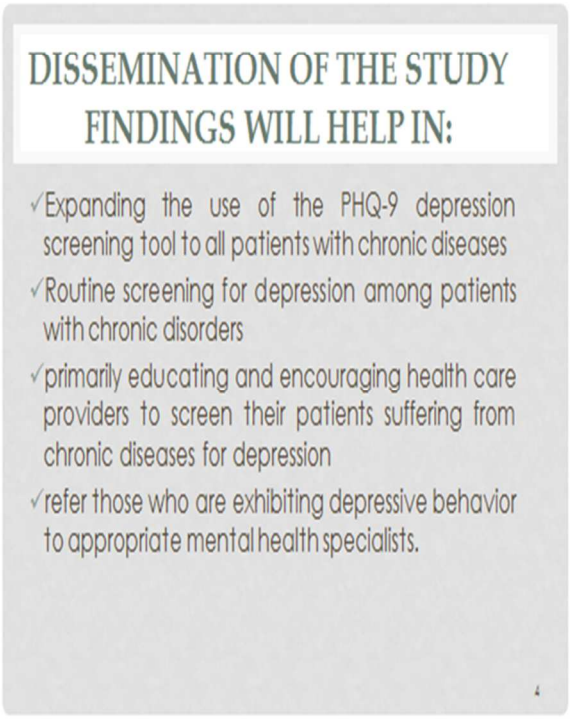
Category for comorbid chronic diseases	Female	PHQ-9 score below 10	PHQ-9 score between 10-14	PHQ-9 score between 15-19	PHQ-9 score between 20-27
1 chronic condition	44	41	3	0	0
1-3 chronic conditions	30	19	5	4	2
Over 3 chronic conditions	42	16	9	11	6

Appendix H: Scholarly Product for Dissemination









BENEFITS TO THE PRIMARY CARE PROVIDERS (PCPS):

- ✓To encourage PCPs to adopt integration of routine screening for depression for their patients
- ✓Lobby for more aggressive depression screening policy guidelines
- ✓Make depression a priority preventive practice in the healthcare industry.
- ✓PCPs to become significant advocates for screening and for promoting depression awareness in their practices and communities.

5

AS A NURSE PRACTITIONER:

- ✓I wish to help patients suffering from depression get the necessary mental health services, they need which would subsequently benefit their medical health
- ✓I would want the results of this study published in the Journal for Nurse Practitioners.

6

AS A NURSE PRACTITIONER:

- ✓I wish to help patients suffering from depression get the necessary mental health services, they need which would subsequently benefit their medical health
- ✓I would want the results of this study published in the Journal for Nurse Practitioners.

7

8