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Relationship Between Remission of Symptoms and Screening for Depression

Juliann Molecavage
Walden University

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College of Health Sciences

This is to certify that the doctoral study by

Juliann Molecavage

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
2017

Abstract

Relationship Between Remission of Symptoms and Screening for Depression

by

Juliann Molecavage

MHA, Walden University, 2014

BSHCM, Walden University, 2013

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Healthcare Administration

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Abstract

Depression is the leading cause of disability in the United States. Insufficient evidence is available about the types of follow-up care that may be most effective. The purpose of this quantitative, retrospective cohort study was to determine whether remission of depression symptoms was associated with recommended follow-up care when controlling for age, gender, and number of previous episodes of depression, and whether symptom reduction was more likely for those who completed a course of treatment from a mental health specialist in comparison to those who were treated by their primary care providers (PCPs) when controlling for the same variables. The theoretical framework for this study was Reingold's theory of outbreak investigations. Existing was retrieved from Geisinger Health System's electronic health record. The following covariates were evaluated for their effects on the re

lationship between positive depression screening and follow-up care: baseline (initial) depression screening score, date of service, age, gender, consecutive depression screening score, date of consecutive depression screening, outcomes, and documented previous history of depression. Retrospective cohort data from 1,246 patients were collected from the study site and analyzed using descriptive statistics, *t* tests, ANOVAs, and multiple linear regression. Findings showed that PCP-initiated medication change and referral to community health were significantly associated with successful intervention. Findings may be used to encourage routine depression screening and increase positive health outcomes for patients with depression.

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Section 1: Foundation of the Study and Literature Review

In January 2016, the U.S. Preventive Services Task Force (USPSTF) recommended screening for depression in all adults (Siu & USPSTF, 2016). Their recommendation was to screen patients before they presented with depression-like symptoms while using a validated screening tool (Siu & USPSTF, 2016). They also recommend that although screening is important, it is also vital to ensure that accurate diagnosis, a plan of care, and routine follow-up are put in place for treatment to be effective (Siu & USPSTF, 2016).

Because depression is one of the leading reasons for disability in the United States, it can be greatly beneficial to screen patients for any type of signs or symptoms of depression (Siu & USPSTF, 2016). Depression can create difficulties at work and in people's personal lives (Siu & USPSTF, 2016). However, screening is just the beginning. Follow-up care is a crucial element in ensuring that patients are receiving quality care that is effective. As indicated by Olfson, Bianco, and Marcus (2016), 72% of patients who screen positive for depression are not getting the follow-up care required to effectively manage and/or treat their mental illness.

Problem Statement

In a U.S. survey, 35% of people with severe depression symptoms reported that they had had no care from a medical professional in the past year (Pratt & Brody, 2014). Routine follow-up care is essential in managing mental illness, especially depression (Pratt & Brody, 2014). Mental illness is a burden on society and is the leading cause of disability across the world (World Health Organization [WHO], 2016a). However, insufficient evidence is available about the type of follow-up care that may be the most cost-effective. Some patients are referred to

mental health specialists and complete a course of treatment, others are referred but do not complete the treatment, others are treated entirely by their primary care provider, and some may decline any treatment (Pratt & Brody, 2014). The current study was designed to fill a gap in understanding by focusing on the outcomes of treatment after testing positive during depression screening (see Pratty & Brody, 2014).

Purpose of the Study

The purpose of this study was to determine whether remission of depression symptoms was associated with recommended follow-up care. This study was unique because by addressing the problem of depression and proposing a way in which primary care providers can play a role in screening and managing patients with depression. The results of this study may improve understanding of the vital role of primary care physicians in mental health. Given the limited resources available in the mental health profession, findings may be used to ensure patients are receiving high-quality mental health services.

Depression accounts for 4.3% of the global burden of disease and is the largest cause of disability worldwide, particularly for women (WHO, 2016). Depression also causes a great burden on the economy (WHO, 2016). The total global impact of mental disorders is estimated to be $16.3 million between 2011 and 2030 (WHO, 2016). Through the creation of a systematic approach for routine depression screening and a standard of care for primary care physicians, the effects of this disease on health, comorbidity, and the economy may be reduced.

Research Questions and Hypotheses

Research Question 1: Among patients who are screened as positive for depression, is symptom reduction more likely for those who receive treatment when controlling for age, gender, and number of previous episodes of depression?

$H_0 1$: There is no statistically significant association between untreated and treated patients in symptom reduction when controlling for age, gender, and number of previous episodes of depression.

$H_a 1$: There is a statistically significant association between untreated and treated patients in symptom reduction when controlling for age, gender, and number of previous episodes of depression.

Research Question 2: Among patients who are screened as positive for depression, is symptom reduction more likely for those who complete a course of treatment from a mental health specialist in comparison to those who are treated by their primary care providers when controlling for age, gender, and number of previous episodes of depression?

$H_0 2$: There is no statistically significant association between symptom reduction and completing a course of treatment from a mental health specialist in comparison to not completing treatment when controlling for age, gender, and number of previous episodes of depression.

$H_a 2$: There is no statistically significant association between symptom reduction and completing a course of treatment from a mental health specialist in comparison to not completing treatment when controlling for age, gender, and number of previous episodes of depression.

Theoretical Framework

The theoretical framework for this study was Reingold's (1998) theory of outbreak investigations. Because this theory provides an approach to investigation of outbreaks using epidemiological principles, it allows for a thorough analysis of hypotheses and can ultimately aid in creating prevention measures (Reingold, 1998). The approach provides details on how to properly investigate outbreaks to design prevention measures and educate the public (Reingold, 1998). Research and application of Reingold's theory of outbreak investigation offered guidance on ways to facilitate standards for screening for primary care physicians as well as standards for follow-up care, thereby allowing for insight into the gap in care around depression by primary care physicians (see Reingold, 1998).

In the current study, unresolved depression was the outbreak. Reingold (1998) provided epidemiological principles that allowed for analysis of the hypotheses and to create prevention measures. Moreover, using this model, implementation of control measures could be applied to people with a depression diagnosis to prove the theory of reduction of symptoms once treatment has started.

Nature of the Study

When it comes to follow-up care for depression, often patients with a positive depression screening do not have follow-up care. The concept of standardizing care is something many regulatory bodies are attempting, such as NCQA and accountable care organizations (Health Affairs, 2014). To be effective with the care that is provided in depression treatment, there needs to be a standard of care (MacArthur Foundation, 2009). From my secondary data source, I extracted the patients who screened positive for depression through a total score of 10 or higher

on the Patient Health Questionnaire-9. Using evidence-based follow-up guidelines, I compared

patients who received recommended follow-up visits for 1 year and patients who did not receive

recommended care. This approach helped to validate treatment guidelines or point to

modifications (see MacArthur Foundation, 2009).

Literature Search Strategy

The following Walden University Library databases were used for this study: Walden

Library Books, PubMed, CINAHL Plus with Full Text, MEDLINE with Full Text, Cochrane

Database of Systematic Reviews, Dissertations & Theses, Dissertations & Theses at Walden

University, ProQuest Central, SAGE Knowledge (formerly SAGE Encyclopedias), SAGE

Research Methods Online, SAGE Stats, Science Journals, and ScienceDirect. I also used Google

Scholar, Google, and the WHO, UNICEF, and CDC websites. The following key terms were

used for the search: *depression*, *mental health*, *anxiety*, *depression follow up*, *depression*

outcomes, *primary care*, *psych*, *depression management*, *PHQ2*, *PHQ9*, *depression screening*,

collaborative care model, *depression clinical outcomes*, *depression remission*, *depression and*

geriatric patients, *depression and comorbid conditions*, *WHO report*, and *CDC outcome reports*.

Although I conducted an open-ended search for literature, emphasis was placed on peer-

reviewed primary publications spanning a period of 5 years (2011-2016). In addition, national

documents, WHO reports, and CDC reports were used to augment the literature review.

Literature Review Related to Key Variables and/or Concepts

Population

In a national survey, 35% of people with severe depression symptoms reported that they

had no care from a medical professional in the past year (Pratt & Brody, 2014). Routine follow-

up care is essential in managing mental illness, especially depression (Pratt & Brody, 2014).

Mental illness is a burden on society and is the leading cause of disability across the world

(WHO, 2016). This study was designed to fill a gap in the literature by focusing on depression

screening and insufficient coordination of follow-up care.

Olfson et al. (2016) reviewed 46,000 patients who screened positive for depression. The

results indicated that only 28% had a follow-up. Follow-up interventions included monitoring,

psychotherapy or counseling, exercise and yoga, pharmacological treatment, and combinations

of treatments. In patients who had serious psychological distress, the results showed that only

21% were treated.

Significance

Depression accounts for 4.3% of the global burden of disease and is the largest cause of

disability worldwide, particularly for women (WHO, 2016). Depression also causes a great

burden on the economy (WHO, 2016). The total global impact of mental disorders is estimated

to be $16.3 million between 2011 and 2030 (WHO, 2016). Through a systematic approach for

routine screening for depression and a standard of care for primary care physicians, the effects of

this disease on health, comorbidity, and the economy may be reduced.

Nationally Validated Screening Tools

Patient-administered screening tools are quick and reliable for patients. This is a natural

first step in assessing patients for depression and monitoring treatment (Bienenfeld & Stinson,

2016). Once a patient-administered screening tool is used, clinical review is required as a follow-

up to make a diagnosis (Bienenfeld & Stinson, 2016). The Diagnostic and Statistical Manual of

Mental Disorders (DSM-5) criteria for major depression indicates that at least five symptoms

must be present within the previous 2 weeks (Bienenfeld & Stinson, 2016). Those symptoms

include depressed mood, marked diminished interest or pleasure, significant weight loss or

weight gain, insomnia or hypersomnia, fatigue, feelings of worthlessness or excessive guilt,

inability to concentrate, or recurrent thoughts of death or suicidal ideation (Bienenfeld &

Stinson, 2016).

Through my literature review, I located many questionnaires available for use in

identifying an underlying depression disorder, including the Hamilton Depression Rating Scale,

Beck Depression Inventory, Patient Health Questionnaire (PHQ), Major Depression Inventory,

Center for Epidemiologic Studies Depression Scale, Zung Self-Rating Depression Scale,

Geriatric Depression Scale, and Cornell Scale for Depression in Dementia (Bienenfeld &

Stinson, 2016). The Patient Health Questionnaire could provide the foundation for an

examination of depression as a syndrome (Zimmerman et al., 2008). The PHQ is the

recommended screening tool from the National Committee for Quality Assurance. The PHQ is

validated starting at age 12 years (Zimmerman et al., 2008).

Adolescents are required to complete the PHQ-9 modified for teens questionnaire

(Zimmerman et al., 2008). Adult patients may be screened using the PHQ-2, which is a two-

question screening tool (Zimmerman et al., 2008). If the patient completes the questionnaire and

receives a total score of 3 or higher, it is recommended the patient then complete the PHQ-9 for a

recommended treatment plan (Zimmerman et al., 2008). This questionnaire is used to assess

patients for depleted interest or pleasure in doing things as well as feelings of depression or

hopelessness. The results allow the clinical team to understand the patient's level of depression

while providing for the effectiveness of treatment (See Appendix A). Measurement is an overall

score from the questions answered. A total score of 10 or higher signifies a positive screen,
requiring a physician's intervention to create a treatment plan. The depression score ranges are as
follows: 5 to 9 (mild), 10 to 14 (moderate), 15 to 19 (moderately severe), 20 or higher (severe).

Screening Outcomes

There are many reasons to measure outcomes for screening, including quality patient
care, regression of symptoms, identification of new symptoms, and treatment adjustments.
Studies showed that many patients are on an antidepressant for several months and are not seeing
any benefits (Zimmerman et al., 2008). Regression of symptoms may occur after initial
treatment; however, symptoms may not have significantly changed and therefore additional
treatment or a change in treatment may be required (Zimmerman et al., 2008). Patients who
refuse treatment or drop out of treatment, typically do so within the first 6 months of initiating
treatment (Zimmerman et al., 2008).

Challenges of Screening for Depression

Several researchers have identified a weak standardization in routine screening for
depression within primary care settings (Gill et al., 2012; Loeb et al., 2015). The USPSTF (2016)
and The National Committee for Quality Assurance (2016) added depression screening as a
recommendation for the general population in January 2016. This recommendation has brought
forth the recognition that depression screening should be standard. However, this is a newly
implemented recommendation, and little literature exists regarding the outcomes.

Another challenge in screening for depression is access to behavioral health specialists.
Olfson et al. (2016) reviewed 46,000 patients who screened positive for depression. The results

indicated that only 28% had a follow-up. For patients who had serious psychological distress, the results showed that only 21% were treated.

Contributing Factors Leading to Depression

Gender. Men are less likely to develop depression. In fact, women are twice as likely to develop depression during their lifetime (Bracken & Reintjes, 2010). Hammen and Padesky (as cited in Bracken & Reintjes, 2010) claimed that there was no significant difference between men and women when it came to depression symptoms. This was based on a study including 972 men and 1,300 women (Bracken & Reintjes, 2010). Nolen-Hoeksema (as cited in Bracken & Reintjes, 2010) reported that there were no gender differences with depression symptoms until age 65.

Age. Many studies have been conducted to determine whether age is a contributing factor in depression. Mirowsky and Ross (1990) found a relationship between age and depression. Results indicated the lowest number of depressed people were around 45 years old (Mirowsky & Ross, 1990). However, depression reached its peak in adults 80 years and older (Mirowsky & Ross, 1990).

A more recent study showed that age does not necessarily have a significant impact on a person's mental health (Bracken & Reintjes, 2010). Bracken and Reintjes (2010) conducted a study of 1,900 adults and children, with even distribution between sexes. Using the Clinical Assessment of Depression, Bracken and Reintjes found no significant differences in depression levels among different age groups. Although older adults were more likely to show depression symptoms, it was not solely based on their age. Instead, depression symptoms were linked to comorbid conditions (Bracken & Reintjes, 2010).

Race/ethnicity. White participants showed significantly lower mean scores than Black

participants (Bracken & Reintjes, 2010). However, there was no difference between Black and Hispanic participants (Bracken & Reintjes, 2010). There were also no race/ethnicity differences for depressed mood or anxiety (Bracken & Reintjes, 2010). Regarding diminished interest, White participants scored significantly lower than Black participants, and Hispanics scored significantly lower than White participants (Bracken & Reintjes, 2010).

Socioeconomic status. Low socioeconomic status was associated with a high likelihood of depression (Lorant et al., 2003). Low social status and low income, in conjunction with low access to health care and a higher likelihood of disease, led to a higher likelihood of depression among this subgroup (Lorant et al., 2003). Higher income and higher education showed a lower likelihood of depression (Lorant et al., 2003).

Marital status. Out of a sample of 1,407 Black women, there was a relationship between marital status and depression. Women who were never married showed significantly higher levels of depression compared to those who were married or who were living with a partner (Scarini et al., 2002). Divorced couples also showed a higher significance of depression (Bruce & Kim, 1992). Men showed a greater risk of first-onset major depression after divorce (Bruce & Kim, 1992).

Operational Definitions

Anxiety and ADHD: According to the National Institute of Mental Health, anxiety disorders and attention-deficit hyperactivity disorder (ADHD) are often diagnosed among people with bipolar disorder.

Behavioral health specialist: A behavioral health specialist, as part of the primary care treatment team, identifies triage and manages patients with medical and behavioral health

problems within the primary care setting. In addition, the behavioral health specialist provides

skill training through psychoeducation and patient education strategies and develops specific

behavioral change plans for patients and behavioral health protocols for target populations.

Bipolar disorder: According to the National Institute of Mental Health, bipolar disorder

is different from depression, but it is included in this list is because someone with bipolar

disorder experiences episodes of extremely low moods that meet the criteria for major depression

(called "bipolar depression"). However, a person with bipolar disorder also experiences extreme

high (euphoric or irritable) moods called *mania* or a less severe form called *hypomania*.

Depression: According to the National Institute of Mental Health, depression (major

depressive disorder or clinical depression) is a common but serious mood disorder. It causes

severe symptoms that affect how a person feels, thinks, and handles daily activities such as

sleeping, eating, or working. To be diagnosed with depression, the symptoms must be present for

at least 2 weeks.

Perinatal depression: According to the National Institute of Mental Health, perinatal

depression is much more serious than the "baby blues" (relatively mild depressive and anxiety

symptoms that typically clear within 2 weeks after delivery) that many women experience after

giving birth. Women with perinatal depression experience full-blown major depression during

pregnancy or after delivery (postpartum depression). The feelings of extreme sadness, anxiety,

and exhaustion that accompany perinatal depression may make it difficult for these new mothers

to complete daily care activities for themselves and/or for their babies.

Persistent depressive disorder: According to the National Institute of Mental Health,

persistent depressive disorder (also called dysthymia) is a depressed mood that lasts for at least 2

years. A person diagnosed with persistent depressive disorder may have episodes of major depression along with periods of less severe symptoms, but symptoms must last for 2 years to be considered persistent depressive disorder.

Psychosis: According to the National Institute of Mental Health, psychosis includes severe episodes of mania or depression and psychotic symptoms such as hallucinations or delusions. The psychotic symptoms tend to match the person's extreme mood. Someone having psychotic symptoms during a manic episode may believe she or he is famous, has a lot of money, or has special powers. Someone having psychotic symptoms during a depressive episode may believe he or she is ruined and penniless, or that he or she has committed a crime. People with bipolar disorder who also have psychotic symptoms are sometimes misdiagnosed with schizophrenia.

Psychotic depression: According to the National Institute of Mental Health, psychotic depression occurs when a person has severe depression plus some form of psychosis, such as having disturbed false fixed beliefs (delusions) or hearing or seeing upsetting things that others cannot hear or see (hallucinations). The psychotic symptoms typically have a depressive theme such as delusions of guilt, poverty, or illness.

Seasonal affective disorder (SAD): According to the National Institute of Mental Health, SAD is characterized by the onset of depression during the winter months when there is less natural sunlight. This depression generally lifts during spring and summer. Winter depression, typically accompanied by social withdrawal, increased sleep, and weight gain, occurs predictably every year in seasonal affective disorder.

Substance Abuse: According to the National Institute of Mental Health, people with bipolar disorder may also misuse alcohol or drugs, have relationship problems, or perform poorly in school or at work. Family, friends, and people experiencing symptoms may not recognize these problems as signs of a major mental illness such as bipolar disorder.

Literature Table Summary

The table below gives an in-depth view of the studies that were reviewed to fully research this topic. Although there are many articles written about mental health and the importance of screening, proactive depression screening recommendations from the United States Preventive Task Force were only introduced in 2016 (United States Preventive Services Task Force, 2016). Loeb et al. (2015) wrote a compelling article that explained the importance of screening in primary care, citing that primary care physicians are fully equipped to screen and treat those with mild to moderate depression without having to offer psychiatric services.

There are many protocols in place that helps primary care physicians understand the basics of treating those who have mild to moderate depression, such as The MacArthur Initiative on Depression and Primary Care (2009). This tool kit was comprised to help support primary care physicians in caring for patients who suffer from depression. They used recommendations that were first created by the US Preventive Service Task Force and NIMH guidelines to create a care management process. The kit provides easy to use tools to assist with many areas, recognizing and diagnosing depression, educating patients about depression, engaging participation, treatment options and monitoring for response of treatment (MacArthur Foundation., 2009).

Table 1

Summary of Literature on Depression Screening, Treatment Recommendations, and Outcomes

Author & Year	Title	Study Design	Study Population	Independent Variable	Dependent variables	Results	Other
Angstman, K., Rohrer, J., Rasmussen, N. (2012)	PHQ-9 Response Curve: Rate of Improvement for Depression Treatment with Collaborative Care Management	Retrospective Cohort Study	7340 patients with depression cared for at 4 outpatient primary care clinics	Collaborative Care Management Patients & Usual Care Patients	Remission of Depression and persistent depressive symptoms	This study demonstrated that patients enrolled in CCM have a faster rate of remission and a shorter duration of PDSs than patients choosing UC.	
Angstman, K., et al. (2014)	Depression Remission Decreases Outpatient Utilization at 6 and 12 months after Enrollment into Collaborative Care Management.	Retrospective Chart Review Analysis	773 patients enrolled into CCM with 6- and 12-month follow-up data	Follow Up at 6 and 9 months	outpatient visit outlier status	remission at 6 months (odds ratio [OR] 0.519, CI [confidence interval] 0.349-0.770, P=0.001) and remission at 12 months (OR 0.573, CI 0.354-0.927, P=0.023) were predictive. With this inverse relationship between remission and outlier status, those patients who were not in remission had an OR of 1.928 for outpatient visit outlier status at 6 months after enrollment and an OR of 1.745 at 12 months	
Ganguly, S., et al. (2012)	Patient Health Questionnaire -9 as an Effective Tool for Screening for Depression Among Indian Adolescents	PHQ9 Randomized Survey	233 adolescent students aged 14-18 years of age with a confirmed diagnosis of depression	Students	Depression	PHQ9 showed to be a successful tool to use with adolescent for early detection of mental illness.	

(table continues)

Author & Year	Title	Study Design	Study Population	Independent Variable	Dependent variables	Results	Other
Gill, J., et al. (2012)	Electronic Clinical Depression Support for Management of Depression in Primary Care: A Prospective Cohort Study.	Prospective Cohort Study	19 primary care practices with 119 providers	PHQ-9 Questionnaire	PHQ-9 Results	the PHQ-9 form was used in 45.6% of the 16,052 adult patients with depression and in 73.7% of the 1,422 patients with new depression.	Many providers reported often using the PHQ-9 and suicide forms and felt them to be very helpful in patient care, with 85% planning to continue their use after the study.
Loeb, D., et al. (2015)	Evaluation of the Role of Training in the Implementation of a Depression Screening and Treatment Protocol in 2 Academic Outpatient Internal Medicine Clinics Utilizing the Electronic Medical Record.	Retrospective Cohort Study	58 providers answered the survey	provider type (resident/faculty), clinic site (Anschutz/Lowry), and training attendance (yes/no)	Survey	The Collaborative Care Model, as well as other integrated care models, improves management of psychiatric illness within the primary care setting	
Meunier, M., et al. (2014)	Impact of Symptom Remission on Outpatient Visits in Depressed Primary Care Patients Treated with Collaborative Care Management and Usual Care.	Retrospective Chart Review Analysis	1733 primary care patients enrolled in collaborative care management or usual care with 6-month follow up data	Clinical remission at 6 months, enrollment into CCM or UC	Decrease in outpatient visit counts after diagnosis of depression	Patients treated in primary care, who had remission (PHQ-9 score < 5) at 6 months decreased the likelihood of the patient having more than 8 visits during the 6 months after diagnosis	
Olfson, M., Bianco, C., Marcus, S. (2016)	Treatment of Adult Depression in the United States	Retrospective Cohort Study	46,417 responses surveys taken in US households by participants aged 18 years or older in 2012 and 2013	Treatment, recurrence of depression symptoms	PHQ9 Score	Approximately 8.4% (95% CI, 7.9-8.8) of adults screened positive for depression, of which 28.7% received any depression treatment	Among all adults treated for depression, 29.9% had screen-positive depression and 21.8% had serious psychological distress

(table continues)

Author & Year	Title	Study Design	Study Population	Independent Variable	Dependent variables	Results	Other
O'Connor, E., et al. (2009)	Screening for Depression in Adult Patients in Primary Care Settings: A Systematic Evidence Review	Retrospective Analysis	9 good quality trials. 7 regulatory reviews or metaanalyses and 3 large cohort studies	Mental health	Depression	Depression screening programs without substantial staff-assisted depression care supports are unlikely to improve depression outcomes.	Close monitoring of all adult patients who initiate antidepressant treatment, particularly those younger than 30 years, is important both for safety and to ensure optimal treatment
Reeves, W., et al. (2011)	Mental Illness Surveillance Among Adults in the United States	Retrospective Cohort Study	CDC Data from 2005-2008	Mental health	Depression	Future mental illness surveillance should measure both depression and anxiety disorders	BRFSS and PRAMS can help identify areas in more need
Rohrer, J., Angstman, K., Pecina, J. (2013)	Application of a case-control design to the analysis of a drop-outs from integrated behavioral health care.	Case-Control	Drop outs from all cases discharged patients	Collaborative Care Patients	Follow up	Dropping out was associated with female sex (P=0.015), younger age (P=0.000) and treatment site (P=0.004)	Sites still in the shake-down period had higher drop-out rates. Depression diagnosis and severity were not significant.
Zimmerman, Mark. (2013)	Using Scales to monitor symptoms and treat depression (measurement based care)	Retrospective Analysis	12 controlled trials (10 random) – 5458 patients with different mental health disorders	Other mental health disabilities	Patients with Depression	Inconsistent scale used to monitor treatment. Too many varieties of screening tools.	Recommendation for screenings to be done consistently at each visit.

Literature Summary

Throughout the literature study there are four major themes; collaborative care management, standardized screening, clinical standards for follow up and patient education on the importance of mental health. Collaborative care management allows for patients to receive subsequent treatment using various care team members. The below literature shows that through this method, there are better outcomes for patients. Additionally, it is important to use a standard tool for screening patients with depression. The PHQ-9 showed to be an effective tool when compared to the Beck Depression Inventory survey. Clinical standards for the treatment of patients with depression is essential. Through the implementation of protocols, preceded by training and standard follow up, patients receive better quality care and have reduced utilization. Finally, patient education is an important aspect of treatment. Patients require time and attention when it comes to mental health concerns and proactively educating patients on the importance of good mental health as well as adhering to treatment regimens is essential. The below information details these themes and provides published articles and research that has laid the groundwork for much of the basis of this study.

Collaborative Care Management

Angstman et al. (2014) completed a retrospective cohort study where they reviewed 7,430 patients with depression and just four were cared for in outpatient primary care sites. This study was conducted to understand whether having collaborative care management embedded in depression treatment would show better outcomes (Angstman et al., 2014). Through their analysis, they could prove that having collaborative care management within primary care is successful (Angstman et al., 2014). Results of the study indicated that the patients who were

enrolled in the collaborative care management program had better outcomes when compared to those who were not (Angstman et al., 2014). Thus, having an improvement in depression symptoms, they could relate this to decreased outpatient utilization for patients diagnosed with depression (Angstman et al., 2014).

Angstman, Rohrer & Rasmussen (2012) completed a retrospective chart review analysis where they reviewed 718 patients who were enrolled in collaborative care model. Patients with a diagnosis of depression were enrolled in the collaborative care model (CCM). These patients and their providers had the option to choose the CCM model or treatment as usual (Angstman, Rohrer & Rasmussen, 2012). Based on retrospective chart reviews in the data that was collected, those who had reached remission by 180 days after diagnosis were included in the study (Angstman, Rohrer & Rasmussen, 2012). At one month, there was a 40% remission rate (Angstman, Rohrer & Rasmussen, 2012). At five months, they were at a 70% remission rate, and the groups were in remission by six months by study design (Angstman, Rohrer & Rasmussen, 2012).

Results of this study suggest that clinical practice varies significantly regarding how often patients receive follow-up after a depression diagnosis (Angstman, Rohrer & Rasmussen, 2012). Early follow up is suggested to decrease the burden of the disease; however, follow up care does not require a physician. Screening can be completed by a nurse care manager, as in this case (Angstman, Rohrer & Rasmussen, 2012).

Patient Health Questionnaire-9

Ganguly et al. (2012) performed a random sampling of pediatrician administered PHQ-9 questionnaires on patients between the ages of 14 and 18 with a clinical diagnosis of depression.

The reason for this study was to test the diagnostic accuracy of the PHQ-9 (Ganguly et al., 2012). 233 patients in total were screened and they concluded that the PHQ-9 questionnaire, when compared to, the Beck Depression Inventory survey was psychometrically sound Ganguly et al., 2012).

Zimmerman (2013) completed a retrospective analysis on 5,458 patients who were randomly selected with a baseline of having a mental health disorder diagnosis. Zimmerman (2013) used scaled to monitor symptoms and treat depression (Zimmerman, 2013). He concluded that inconsistent scales were used to monitor treatment and that too many varieties of screening tools were available (Zimmerman, 2013). He recommended that there should be an alignment of screening tools to set one standard for better measurement of outcomes (Zimmerman, 2013).

Clinical Standards for Treatment

Loeb et al. (2014) explained that systematic approaches to depression identification and management are effective though not consistently implemented. The team created an algorithm for the care team to follow which was also embedded in their electronic medical record Loeb et al., 2014). The team completed a retrospective data analysis and found that attending training sessions were associated with an increase in documenting the PHQ-9 by 2.4 times (Loeb et al., 2014). The research team implemented a depression protocol, preceded by training, in two faculty-resident practices. Medical assistants used the Patient Health Questionnaire (PHQ)-2 for initial screening; providers performed the PHQ-9. These were documented in the electronic medical record.

Meunier et al. (2014) explained that depression remission and treatment decreases the number of visits to primary care. Successful treatment at six months reduced the likelihood of the

patient having more than eight visits during the six months following the original diagnosis of depression (Meunier et al., 2014). This study included a retrospective chart review analysis on 1,733 primary care patients who were enrolled in collaborative care management and had six months follow up data (Meunier et al., 2014). They concluded that there is a decrease in outpatient utilization when a patient has successful remission at six months after the initial depression diagnosis (Meunier et al., 2014).

O'Connor et al., (2009) completed an analysis of 33 articles on the benefits and harms of screening patients for depression in primary care settings. They concluded that without having systematic support within the primary care clinics, the depression outcomes would unlikely improve (O'Connor et al., 2009). Additionally, patients who have an initial diagnosis of depression should be carefully monitored, particularly those younger than 30 years old to ensure safety and optimal treatment (O'Connor et al., 2009).

Olfson, Blanco & Marcus, 2016 completed a retrospective cohort study on 46,417 responses to surveys in the United States households of patients 18 years of age or greater in 2012 and 2013. Their efforts were to characterize the treatment of the above patient population (Olfson, Blanco & Marcus, 2016). 8.4% screen positive for depression, yet only 28.7% of that population received treatment (Olfson, Blanco & Marcus, 2016). If they had received treatment, studies suggest their remission scores would improve (Olfson, Blanco & Marcus, 2016). Lastly, they suggest that it is vital to strengthen the efforts to align depression care based on individual patient's needs (Olfson, Blanco & Marcus, 2016).

Patient Education on Mental Health

Reeves et al. (2011) completed a retrospective cohort study of data from CDC surveillance systems that measure the prevalence and impact of mental illness. From 2005 to 2008, the CDC collected data showing that 6.8% of adults have moderate to severe depression and that depression prevalence is higher in southeastern states compared to other states (Reeves et al., 2011). They concluded that increasing awareness around the value of mental illness surveillance is essential, is increasing emphasis on public health actions and using monitoring to measure outcomes (Reeves et al., 2011).

Rohrer, Angstman & Pecina (2013) completed a case-control design study to demonstrate the feasibility of the method in a primary care practice setting and to understand why dropout patients chose not to follow up with the care provided to them. The study showed that dropout rates were more likely in geographic areas that had newer primary care sites, and that, established sites had a significantly lower drop-out rate (Rohrer, Angstman & Pecina, 2013). When implementing a program, it is crucial to address managerial problems in healthcare organizations (Rohrer, Angstman & Pecina, 2013).

Accessibility of Mental Health Care

Access is a significant issue when it comes to professional care for mental disorders (Costello et al., 2013). Less than half of adolescents with psychiatric disorders received any treatment (Costello et al., 2013). While access to care is challenging, social stigma continues to surround mental health disorders (Costello et al., 2013).

In 2013, 10% of adolescents lacked insurance. Even in those that are covered, a number of mental health services they can receive is often limited (Mustangs, Garofalo, & Emerson,

2010). Initially identifying a mental health disorder is also challenging and routine screening is seldom done. In relation to children, mental health disorders are often times first recognized in school (Mustanski, Garofalo, & Emerson, 2010).

There are several disparities documented by researchers. Those who are least likely to receive care are homeless or have been in child welfare and/or juvenile justice systems (Mustanski, Garofalo, & Emerson, 2010). Additionally, disparities exist in categories among those who are lesbian, gay, bisexual and/or transgender and of these groups, they are often the least likely to receive services (Mustanski, Garofalo, & Emerson, 2010).

Care-Seeking Behaviors for Mental Health Disorders

Models of behavior surrounding illness and care-seeking, such as Andersen's (1995) and Mechanic's (1962), accentuate the social and behavioral reinforcements of health decision making (Ojeda & Bergstresser, 2008). Andersen identifies health beliefs as an essential component of perceived need for health services and actual utilization (Ojeda & Bergstresser, 2008).

Health attitudes and values explain how social structure may influence resources, the need and the future use (Ojeda & Bergstresser, 2008). Since beliefs about health and the perceived need, are not sufficient to explain a person's future behavior. Understanding health attitudes and valuces can help to understand the variation between the utilization of services across various groups (Ojeda & Bergstresser, 2008).

This model of behavior and theory supports the concept that proactive screening will allow primary care physicians to find underlying depression symptoms that perhaps were not known to the patient. Many patients feel depressed but think that is a normal way of life,

especially those who are elderly. This type of mindset then puts the patient's overall health at

risk, as well as any comorbid conditions they have, leaving them with a diminished quality of life

and susceptible to earlier death (Sharp & Lipsky, 2002).

Mechanic (1962) identifies 'illness behavior' as a vital component of whether diagnosis

and treatment will ever occur; this behavior is in part based upon whether the adoption of a 'sick

role' is consistent with an individual's social setting and position within the social group (Ojeda

& Bergstresser, 2008). Shame and embarrassment is one deterrent to seeking care in mental

health situations as is perceived loss of social status (Ojeda & Bergstresser, 2008).

Gender also has implications for help-seeking (Ojeda & Bergstresser, 2008). Males and

females seek out care for mental health care differently (Ojeda & Bergstresser, 2008). Stigma is

considered a potential explanatory factor for the lower rate of mental health treatment among

men; however little research has found the reasons why (Ojeda & Bergstresser, 2008).

This theory has been shown to be consistent with the overall screening success rates

between men and women. Many times, men will decline to be screened because of the stigma.

Additionally, men are less likely to seek care for mental health problems because of the

vulnerability that they must put themselves in.

Many patients have a primary care provider whom they bond with and the patient and

primary care provider have a trusted relationship. This relationship could help create a better

atmosphere for the patient to be more likely to agree to screen for depression and expressing

their feelings, therefore leading to better outcomes. This outcome could lead to better overall

health as well as better results for any comorbid conditions they may have.

Assumptions

There were assumptions made to this study, such as, missing data, which could occur in a completely random manner and thus their absence will not bias the study, even if a list wise or case wise data deletion technique will be used in data manager. Participants in this study told the interviewers the truth concerning the various variables for this study. Previous history of depression, when applicable, is in an area of the patient's chart that can be pulled with the data set. Lastly, documentation of follow up is retrievable. Considering these assumptions enhances the validity of the study.

Limitations

The following limitations of this study are hereby acknowledged, this study relied on primary data analysis, thus some variables that may have added value to the study may not be in the dataset. Any data that was missed may affect the inferences drawn from this study and the researcher could not modify the dataset to ensure no missing data. Information bias resulting from varying levels of recall capacities of the respondents (whom have different levels of health literacy) may have negatively affected the findings of this study. Patients who were seen outside of the health system where the data will be pulled could be missing.

Scope and Delimitations

The data was collected from Geisinger's electronic health record and only included depression screenings that were completed in one year's time. The delimitations of this study included a retrospective study from electronic health records over a 5-year period. There were no control groups for comparison nor interventions for temporal analysis. The study was delimited to the variables present in the dataset selected for this study.

Potential for Positive Change

In a national survey, 35% of people with severe depression symptoms reported that they had no care from a medical professional in the past year (Pratt & Brody, 2014). Routine follow up to care is essential in managing mental illness, specifically for depression (Pratt & Brody, 2014). Mental illness is a burden on society and is the leading cause of disability across the world (World Health Organization, 2016). However, insufficient evidence is available about the type of follow-up care that may be most cost-effective.

Depression alone accounts for 4.3% of the global burden of disease and is among the most significant single causes of disability worldwide, particularly for women (WHO, 2016). Depression also causes a significant burden on the economy (WHO, 2016). The total global impact of mental disorders is estimated to be $16.3 million between 2011 and 2030 (WHO, 2016). By creating a systematic approach for routine screening for depression and a standard of care for primary care physicians, the significance that this disease has on health, comorbidity, and the economy could be drastically improved. Healthcare organizations could find benefit in the overall cost savings by decreasing utilization, particularly for overuse of emergency departments and inpatient services. Additionally, by creating a standard follow-up, patients will receive continuous follow up and utilizing outpatient services less, creating more access to primary care.

The findings of the proposed study may be used to strengthen decision-making and policy guidelines, and the implementation of the following decisions and policies. Also, the results may fill the gap knowledge currently seen in factors hindering the effective and efficient utilization of available resources for the improvement of mental health screening and proper

follow up. There are several disparities documented by researchers. Of those who are least likely to receive care of those who are homeless or have been in child welfare and/or juvenile justice systems (Mustanski, Garofalo, & Emerson, 2010). Additionally, disparities exist in categories among those who are lesbian, gay, bisexual and/or transgender and of these groups, they are often the least likely to receive services (Mustanski, Garofalo, & Emerson, 2010).

Knowledge gained from the findings could empower health workers with information for better health programming in primary care for mental health. Findings should service as baseline information for evidence-based health policies, especially in the management of depression. Results should be used for extensive bottleneck analysis of the mental health burden across the United States.

Finally, education of both health workers and community members in the implementations of the findings may result in community empowerment and ownership and occasionally, community development and implementation of public programming. Furthermore, their involvement may help develop the need for access to more mental health providers.

Summary and Conclusion

Section 1 elaborately described the practice and benefits of screening for depression and the need for routine follow up in primary care settings. In addition, the purpose of the study, the nature of the study, the research questions and hypotheses, a detailed literature review with emphasis on limitations, delimitations and assumptions were given. The section ended with a description of the social change impact of the study.

Section 2 is focused on the methodology used for this inquiry. In this section, the population studied were described, the dataset used discussed, data management processes elaborated, and ethical issues and threats to validity explained.

Section 2: Research Design and Data Collection

The purpose of this study seeks was to examine whether intervention with positive depression screening was related to improved overall depression symptoms. Depression places a tremendous burden on society, and determining a correlation between standard follow-up practices for those who screen positive could lead to standardization of treatment. This study focused on patients with a positive depression screening. The following covariates were evaluated for their effects on the relationship between positive depression screening and follow-up care: baseline (initial) depression screening score, date of service, age, gender, consecutive depression screening score, date of consecutive depression screening, outcomes, and documented previous history of depression. This chapter includes a description of the study variables, covariates, research design, research questions and hypotheses, sampling procedures, instruments and constructs, sample size, data analysis plan, threats to validity, ethical considerations, and data management processes.

Modeled Studies

Angstman et al. (2014) completed a retrospective cohort study in which they reviewed 7,430 patients with depression who were cared for in four outpatient primary care sites. This study was conducted to understand whether having collaborative care management embedded in depression treatment would show better outcomes, which could domenstrate that having collaborative care management within primary care is successful (Angstman et al., 2014). Findings showed that the patients who were enrolled in the collaborative care management program had better outcomes compared to those who were not (Angstman et al., 2014).

Collaborative care management was related to decreased outpatient utilization for patients

diagnosed with depression (Angstman et al., 2014).

Angstman et al. (2012) completed a retrospective chart review analysis in which they

reviewed 718 patients who were enrolled in a collaborative care program. Patients and/or

providers had the option to choose the CCM model or treatment as usual (Angstman et al.,

2012). Based on retrospective chart reviews, those who had reached remission by 180 days after

diagnosis were included in the study (Angstman et al., 2012). At 1 month, there was a 40%

remission rate, and at 5 months there was at a 70% remission rate (Angstman et al., 2012).

Care-Seeking Behaviors for Mental Health Disorders

Models of behavior around illness and care seeking, such as Andersen's (1995) and

Mechanic's (1962), emphasize the social and behavioral reinforcements of health decision-

making (Ojeda & Bergstresser, 2008). Andersen (as cited in Ojeda & Bergstresser, 2008)

identified health beliefs as an important component of perceived need for health services and

utilization. Health attitude and values explain how social structure may influence resources,

need, and future use (Ojeda & Bergstresser, 2008). Because beliefs about health and the

perceived need are not sufficient to explain a person's future behavior, it can help understand the

variation between utilization of services across various groups (Ojeda & Bergstresser, 2008).

According to this model of behavior, proactive screening will allow primary care

physicians to find underlying depression symptoms that perhaps were not known to the patient.

Many patients feel depressed but think that is a normal way of life, especially those who are

elderly. This mind-set then puts the patient's overall health at risk, as well as any comorbid

conditions they have, leaving the person with a diminished quality of life and susceptible to premature death (Borowsky et al., 2000).

Mechanic (1962) identified illness behavior as a crucial component of whether diagnosis and treatment will occur. This behavior is in part based on whether the adoption of a sick role is consistent with an individual's social setting and position within a social group (Ojeda & Bergstresser, 2008). Shame and embarrassment is one deterrent to seeking care in mental health situations, as is perceived loss of social status (Ojeda & Bergstresser, 2008).

Research Design and Rationale

After receiving IRB approval (06-21-17-0344093) by Walden University, I extracted the raw data set from the study site. I used a retrospective cohort inquiry approach to collect the data followed by a retrospective quantitative study to analyze the data. The data set chosen for this research was available to me from Geisinger Health System. Geisinger agreed to allow me to use de-identified data from their electronic health record. Geisinger began screening patients for depression in 2012, using the PHQ-9 tool in their community medicine clinics which spans across northeastern and central Pennsylvania. This tool is used for patients age 18 and older, is available at each office visit, and is required once per year unless there is a previous score higher than 10. The data set has over 750,000 patients who completed the questionnaire, including their scores, interventions, and follow-up treatments. Based on my G Power analysis, I chose to have SPSS randomly choose 1,282 cases out of the original 15,784 available for the 2015 year.

Treatment was considered as having seen a professional mental health provider and whether the overall PHQ-9 score had decreased.

The independent variable in this study was treatment. The selection criteria for this study included a positive depression score. Patients with a score of 10 or higher were categorized as having a positive depression screening, which required further intervention. The PHQ-9 was used in all outpatient primary care offices for patients 18 and older. The exclusion criteria for this sample were patients who were referred outside of the study site health system for professional mental health services.

The dependent variable was symptom reduction. Covariates were initial date of visit, age, initial screening, gender, and location. Covariates were broken into groups so they could be measured appropriately. Patients who had previous treatment were also added. Multiple linear regression analysis was used to evaluate the relationship between positive depression screening and symptom reduction follow-up for these covariates.

Screening referred to a screening within a primary care outpatient visit. For patients who were seen more than once during the measurement period, each visit was considered a separate screening. The data included patients who were 18 years of age or older who had a completed office visit with a PHQ-9 score of 10 or higher within the calendar year 2015. Additional inclusion criteria were those who had a follow-up with either a professional mental health provider or their primary care provider, or anyone who had a previous history of depression dating back 5 years from 2015. The comparison group consisted of patients with a primary score of 10 or higher with subsequent office visits and another depression screening based on the criteria above.

Descriptive statistics were run for each variable; then two-way tables were run between the follow-up screening and each independent variable. A multivariable linear regression model was used to evaluate the relationship with intervention in the two-way tables, with depression screening results as the primary predictor. Results included analyses of relationships between the various covariates and intervention. Individuals who underwent intervention after their initial positive depression screening were compared to their original score to test the hypothesis that the patient with treatment had a more successful intervention.

Methodology

The methodology included the area/population, data management processes, sampling techniques, threats to validity, and ethical considerations.

Population

The target population consisted of outpatient primary care patients age 18 or over who were seen in 2015. The sample was taken from the total number of office visits that were completed using the PHQ-9 throughout 2015.

Sampling and Sampling Procedures

The sampling criteria included patients who had a completed office visit in a primary care office, completed a PHQ-9 in 2015, and were 18 years of age or older. Sample size was calculated using G*Power. Sample size analysis was carried out for the dependent variable of depression results, to give a power of 95%, and a 95% two-sided confidence interval. The minimum sample size was 1,282.

Procedures for Data Collection

The study site nurse information officer gave permission to use the requested de-identified data for research purposes. The data set included all patients who completed PHQ-9 questionnaires, were age 18 or over at the time of visit during 2015, and completed primary care visit. For each case, I confirmed the date of office visit and completed PHQ-9 score. Additionally, I confirmed the patient's age and gender at the time of the visit, the medical record number, the follow-up visit date with either a professional mental health provider or PCP, and the corresponding PHQ-9 results. The following were confirmed for the independent variable: referred to mental health professional, referred to treatment, and completion of treatment. The second variable included whether the primary care provider completed any of the following: medication therapy, education, or counseling.

Instrumentation and Operationalization of Constructs

The Patient Health Questionnaire was used as the foundation for an examination of depression as a syndrome (Zimmerman et al., 2008). The Patient Health Questionnaire is the recommended screening tool by the National Committee for Quality Assurance. The Patient Health Questionnaire is validated starting at 12 years of age (Zimmerman et al., 2008). Adolescents are required to complete the PHQ-9, modified for teens questionnaire (Zimmerman et al., 2008).

Adult patients may be screened using the PHQ-2, which is a two-question screening tool (Zimmerman et al., 2008). If the patient completes the questionnaire and receives a total score of 3 or higher, the patient is encouraged to complete the PHQ-9 for a recommended treatment plan (Zimmerman et al., 2008). This questionnaire is used to assess patients for depleted interest or

pleasure in doing things as well as feelings of depression or hopelessness. The results allow the

clinical team to understand the patient's level of depression while providing for the effectiveness

of treatment (See Appendix A). Measurement is an overall score from the questions answered. A

total score of 10 or higher signifies a positive screen, requiring a physician's intervention to

create a treatment plan. The depression score ranges are as follows: 5 to 9 (mild), 10 to 14

(moderate), 15 to 19 (moderately severe), 20 or higher (severe).

Screening Outcomes

There are many reasons to measure outcomes for screening, including quality patient

care, regression of symptoms, identification of new symptoms, and treatment adjustments.

Studies showed that many patients are on an antidepressant for several months and are not seeing

any benefits (Zimmerman et al., 2008). Regression of symptoms may occur after initial

treatment; however, symptoms may not have significantly changed and therefore additional

treatment or a change in treatment may be required (Zimmerman et al., 2008).

Data Analysis Plan

Data were reviewed for duplicate cases, clear inconsistences, and missing data to

determine whether cases could be retained. Patients seen more than once in the data collection

period were treated as separate screenings. Descriptive statistics were calculated on each

variable, and data were examined to identify outliers or erroneous data.

Research Questions and Hypotheses

Research Question 1: Among patients who are screened as positive for depression, is

symptom reduction more likely for those who receive treatment when controlling for age,

gender, and number of previous episodes of depression?

H_01: There is no statistically significant association between untreated and treated patients in symptom reduction when controlling for age, gender, and number of previous episodes of depression.

H_a1: There is a statistically significant association between untreated and treated patients in symptom reduction when controlling for age, gender, and number of previous episodes of depression.

The method of measurement was a difference score analysis, which involved subtracting the dependent variable (baseline score) from the follow-up score, followed by a multiple linear regression analysis for the independent variable and covariate. A *t* test, which was derived from multiple linear regression analysis, was used to compare mean depression screening change for patients who were treated.

Research Question 2: Among patients who are screened as positive for depression, is symptom reduction more likely for those who complete a course of treatment from a mental health specialist in comparison to those who are treated by their primary care providers when controlling for age, gender, and number of previous episodes of depression?

H_02: There is no statistically significant association between symptom reduction and completing a course of treatment from a mental health specialist in comparison to not completing treatment when controlling for age, gender, and number of previous episodes of depression.

H_a2: There is no statistically significant association between symptom reduction and completing a course of treatment from a mental health specialist in comparison to not completing treatment when controlling for age, gender, and number of previous episodes of depression.

The method of measurement was a difference score analysis, which involved subtracting the dependent variable (baseline score) from the follow-up score, followed by a multiple linear regression analysis for the independent variable and covariate. A *t* test, which was derived from multiple linear regression analysis, was used to compare mean depression screening change for patients who initially screened positive and were treated by a mental health specialist.

Threats to Validity

Threats to External Validity

Each outpatient clinic has various workflows for rooming patients and capturing data, however, each clinic has a standard way to complete the screening. Physicians, physician's assistants, certified registered nursing practitioners and mental health specialists all use their own clinical judgement and have their own approaches. Lastly, one commonality to all care providers is that they have a commitment to quality care and to improve outcomes for patients with a positive mental health evaluation.

Threats to Internal Validity

One potential threat to internal validity is the extent to which of my statistical test assumptions are met.

Threats to Construct or Statistical Conclusion Validity

Threats to construct or statistical conclusion validity in this study may be found in potential selection bias, in that patients who are found to receive intervention could be of those who are deemed at higher risk or are more willing to intervention.

Summary and Conclusions

Section 2 included a description of the study variables, covariates, research design, research questions and hypothesis, sampling procedures, explanation of instruments and constructs used, determinations of sample size, a data analysis plan, report of threats to validity, ethical considerations, and data management processes.

The results of this study are in pursuit to provide further insight into whether intervention with positive depression screening is related to overall improved depression symptoms. As previously defined, mental health problems are a tremendous burden on society, and by understanding, there is a relationship between standard follow up for those who screen positive could lead to standardization of treatment. Hence, this research is designed to fill a gap in understanding by focusing specifically on the outcomes of treatment for those patients who have a positive depression screening (Pratty & Brody, 2014).

The results of this study focused on patients with a positive depression screening, because of the burden undiagnosed depression can cause. The following covariates were evaluated for their effects on the relationship between positive depression screening and follow up care: baseline (initial) depression screening score, date of service, age, gender, consecutive depression screening score, date of consecutive depression screening, outcomes and documented previous history of depression, when applicable. In Section 3, methodology, and procedures for the data collection and findings are reviewed.

Section 3: Presentation of the Results and Findings

The purpose of this study was to determine whether remission of depression symptoms was associated with recommended follow-up care. This project was unique because it addressed the problem of depression and proposed a way in which primary care can play a role in screening and managing patients with depression. The results may be used to understand the vital role of primary care physicians in mental health. Through creation of a systematic approach for routine depression screening and a standard of care for primary care physicians, health, comorbidity, and the economy could be improved. In this section I describe the data collection, descriptive and demographic characteristics, data analysis, and results. The following hypotheses were used to guide the study:

$H_0 1$: There is no statistically significant association between untreated and treated patients in symptom reduction when controlling for age, gender, and number of previous episodes of depression.

$H_a 1$: There is a statistically significant association between untreated and treated patients in symptom reduction when controlling for age, gender, and number of previous episodes of depression.

$H_0 2$: There is no statistically significant association between symptom reduction and completing a course of treatment from a mental health specialist in comparison to not completing treatment when controlling for age, gender, and number of previous episodes of depression.

$H_a 2$: There is no statistically significant association between symptom reduction and completing a course of treatment from a mental health specialist in comparison to not completing treatment when controlling for age, gender, and number of previous episodes of depression.

Before describing the findings of this study related to the research questions, I explain how the data were handled including the data translation process, why data were discarded, data cleaning and preparation, and data organization.

Data Handling

Data Transfer, Translation, Cleaning, Coding, and Organizing

Data transfer. After receiving IRB approval (06-21-17-0344093) by Walden University, I extracted the raw data set from the study site and saved it to my personal laptop, which is password protected.

Data translation. I transferred the data from the original file to an Excel spreadsheet and formatted the data appropriately. Once the data were cleaned and organized, I imported them to SPSS for statistical analysis.

Data cleaning and discarding. Data transferred from the study site were received without any patient identification. The file was saved with only medical record numbers, location of the completed questionnaire, demographic information, and questionnaire results. No data were missing for any case. The original G* Power analysis suggested 1,282 cases. Out of the 1,282 cases obtained, there were 36 duplicate records. This resulted in a final data set of 1,246 cases.

Data Coding and Recoding

Dependent variable coding and recoding. Although only one dependent variable (difference score) was considered for this study, it was subjected to a two-step coding process. The first coding process included a dichotomic variable for correlation and linear regression analysis. The difference score resulted in a new variable that resulted from subtracting the

follow-up PHQ-9 score from the original PHQ-9 score. This coding process was designed to determine whether the patient had a positive or negative response to the initial intervention. Patients who either declined or did not have a follow-up response value were considered dropouts. The dropout variable was created based on a result in the follow-up response field of patient declined or no follow-up was detected in the variable category.

Independent variable coding and recoding. The data set comprised a 10 independent variables (IVs) that included three demographic variables of age, gender, and county. These variables were used in descriptive statistical analysis and in correlation analysis. Age was categorized using the following groups: 18-29, 30-45, 46-55, 56-64, 65-74, and 75-101. Gender was coded as a bivariate with 0 assigned to men and 1 to women. County was coded categorically based on the county where the questionnaire was completed. Month was also used as an IV and coded categorically as well.

A total of six outcome variables were used as IVs: previous treatment, no change in follow-up by mental health, no change in follow-up by primary care provider (PCP), patient declined treatment, PCP initiated a medication change, and patient was referred by PCP to a community mental health provider. Each of these variables were originally coded by a manual chart review as yes or no based on the outcome of the follow-up response. When a patient had a positive PHQ-9, the provider had the responsibility of indicating what the intervention would be. In each case, the patient was put into one of the six outcome interventions. Each variable was then recoded using dichotomized variables; each no was assigned a 0, and each yes was assigned a 1. After completing the data cleaning, coding, recoding, and organizing, I calculated the mean, standard deviation, and p values for demographic data and the six outcome variables.

Description of the Variables

The results are presented in four sections with each section addressing a depression category and as an overall population set. The first section presents results for demographics, and the second section presents results for statistical analyses.

Age

Although the mean age for the study sample was 45 years, the screening was conducted on a wide range of patients, with the youngest being 19 and the oldest being 101. Patients were broken down into categories of ages: 18-29, 30-45, 46-55, 56-64, 65-74, and 75101 (see Table 2). Patients in the age groups between 18 and 64 were found not to be of statistical significance ($p < .05$); therefore the null hypothesis was affirmed. However, the patients in the age category of 75-101 had a p value of .047, ($p < .05$); therefore, the null hypothesis was rejected.

Table 2

Frequency Distribution of Demographic Variables Among Study Subjects (N=1,246)

Variable	Frequency	%
Age *(N=1,246)*		
18-29	266	21.3%
30-45	379	30.4%
46-55	272	21.8%
56-64	164	13.2%
65-74	109	8.7%
75-101	50	4.5%

Gender

Table 3 shows that women composed a larger portion of the sample with a total of 882 (71%). However, gender had a p value of .178, so the null hypothesis was affirmed.

Table 3

Frequency Distribution of Demographic Variables Among Study Subjects (N=1,246)

Variable	Frequency	%
Gender *(N=1,246)*		
Male (% of patients)	364	29.2%
Female (% of patients)	882	70.8%

County

Table 4 shows the distribution of results based on the county in which the patient completed the PHQ-9 questionnaire. Although the sample was intended to be dispersed evenly, there were areas in the data set that had higher patient percentages than others. Mifflin county had the largest portion with 228 patients (18.3%). Juniata and Clinton counties were second with 12 patients (1%) and 23 (1.8%) patients. County showed no statistical significance to the model and therefore was not included in the regression model.

Table 4

Frequency Distribution of Demographic Variables Among Study Subjects (N=1,246)

Variable	Frequency	%
County *(N=1,246)*		
Adams	25	2%
Centre	114	9.1%
Clinton	23	1.8%
Columbia	203	16.3%
Juniata	12	1%
Lackawanna	18	1.4%
Luzerne	134	10.8%
Lycoming	103	8.3%
Mifflin	228	18.3%
Northumberland	49	3.9%
Schuylkill	170	13.6%
Snyder	60	4.8%
Union	69	5.5%
Wyoming	38	3.0%

Month

The time of year was taken into consideration in the statistical analysis. The distribution of completed PHQ-9 questionnaires were well dispersed throughout the data set (see Table 5). The months of January, February, March, April, October, November, and December showed a statistical significance ($p < .05$).

Table 5

Frequency Distribution of Demographic Variables Among Study Subjects (N=1,246)

Variable	Frequency	%
Month (*N* = 1,246)		
January	80	6.4%
February	119	9.6%
March	131	10.5%
April	104	8.3%
May	100	8%
June	119	9.6%
July	129	10.4%
August	120	9.6%
September	94	7.5%
October	105	8.4%
November	71	5.7%
December	74	5.9%

Table 6 shows that the initial mean score for the PHQ-9 was 16 and the minimum was 10 and maximum score was 27. Each total was categorized by severity based on the PHQ-9 severity definition. Most patients reported moderate depression (41.7%), which was a total score between 10 and 14. The next largest group was moderate/severe depression (35.3%) with a total score between 15 and 19.

The follow-up responses had a mean of 9, 7 points lower than the initial score. The minimum was 0 and the maximum was 27. The follow-up results were categorized by depression severity, which is defined by the PHQ-9 questionnaire. The results showed that 30% of patients declined the follow-up questionnaire, 17% scored negatively with a total score of 0 to 4, and 15.7% had no follow-up recorded. Out of the 673 patients who completed a follow-up, 78.5% were already under treatment. Only 1.8% of those patients declined treatment, and 38.4% had a medication change by their primary care provider at the follow-up visit.

Table 6

Descriptive Statistics – Clinical Information – PHQ-9 (N=1,246)

Variable	Frequency	%
PHQ-9 Initial Score *(N=1,246)*		
Mean	16.08	
Median	15.00	
Std. Deviation	4.356	
Range	17	
Minimum	10	
Maximum	27	
PHQ9 Initial Total: Depression Severity *(N=1,246)*		
Moderate Depression 10-14	520	41.7%
Moderate/Severe Depression 15-19	440	35.3%
Severe Depression 20-27	286	22.9%
PHQ9 Follow Up Response *(N=673)*		
Mean	9.40	
Std. Deviation	7.419	
Minimum	0	
Maximum	27	
PHQ-9 Follow Up Response Value: By Category (N=1,246)		
Patient Declined	378	30.3%
No Follow Up	195	15.7%
Minimum/None (0-4)	213	17%
Mild Depression (5-9)	156	12.5%
Moderate Depression (10-14)	128	10.3%
Moderately/Severe Depression (15-19)	98	7.9%
Severe Depression (20-27)	78	6.3%
Interventions:		
Previous Treatment		
Yes	979	78.5%
No	276	21.4%
PCP Initiated Medicaiton Change		
Yes	475	38.2%
No	771	61.9%
Referred to Community Mental Health		
Yes	225	18.1%
No	1,021	81.9%
Referred to Specialty Inpatient Psychiatry		
Yes	0	0%
No	0	0%

Table 7 shows that 99.4% of patients received their initial PHQ-9 by their primary care provider, 99.6% received their follow up by their primary care provider as well. Using difference score analysis which would subtract the dependent variable of baseline follow, then using a multiple linear regression analysis for the independent variable and covariant. T-test derived from multiple linear regression analysis to compare mean depression screening change for patients who initially screen positive and were treated by a mental health specialist.

Table 7

Descriptive Statistics – Initial Screening & Follow Up Screening (N=1,246)

Variable	Frequency	%
Initial PHQ 2_9 Questionnaire *(N=1,246)*		
Primary Care Provider	1,238	99.4%
Mental Health Provider	8	0.6%
Follow Up PHQ 2_9 Questionnaire *(N=1,246)*		
Primary Care Office	1,241	99.6%
Mental Health Provider Office	5	0.4%

Table 8 is the descriptive statistics for the difference score. The difference score was used as the dependent variable which was computed by taking the patients original (initial) score and subtracting it against the follow up score. Taking in account for patients who refused their follow up screening as well as those who did not have a follow up documented were part of the drop out criteria. The total number of patients, out of the original number, accounted for 750 patients where a difference score could be computed.

Table 8

Descriptive Statistics – Difference Score (N=750)

Difference *(N = 750)*	
Minimum	-16.0
Maximum	27
Mean	6.009
SD	7.3489
95% Confidence Interval of the Difference	
Lower	5.483
Upper	6.536

Two-Way Tests

Table 9 is showing the various age categories that were in the total number of difference score output. Each age category was run through ANOVA to total number, mean and standard deviation. A statistically significant value, is one that is p < .05. In the noted ANOVA below, the age ranges from 65 through 101. The age group of 65-74 had a p = .110 and the age group of those 75-101 had a p = .100. Therefore, we can reject the null hypothesis that age does not have a correlation with depression.

Table 9

ANOVA – Dependent Variable (Difference Score Compared to Age Category) (N=750, p=0.027)

Age Group	N	Mean	Std. Deviation
18-29	165	6.624	8.14080
30-45	209	7.110	7.3591
46-55	136	5.985	7.4565
56-64	80	6.563	6.6004
65-74	58	6.500	7.0344
75-101	25	8.480	7.2521

Table 10 is showing gender compared to the total number of difference score output. Females were dominant in this number with a total of 475, whereas only 198 males were

represented. They both had a p value <.05, therefore, we can reject the null hypothesis that gender does not have a correlation with depression.

Table 10

ANOVA – Dependent Variable (Difference Score Compared to Gender) (N=750, p=0.217)

Gender	N	Mean	Std. Deviation
Male	198	6.146	7.7978
Female	475	6.926	7.3042

Each of the independent variables were then ran through ANOVA separately to compare the variable to the difference score (DV). (Table 9-18).

Table 11 is showing the month that the survey was completed compared to the total number of difference score output. The months were fairly distributed with January through April and October through December.

Table 11

ANOVA – Dependent Variable (Difference Score Compared to Month) (N=673, p=.342)

Month	Mean	N	Std. Deviation
January	7.356	45	8.4750
February	5.453	75	6.7949
March	8.944	71	7.2740
April	6.085	59	7.8768
May	6.404	47	6.9522
June	6.636	66	7.6934
July	7.235	68	7.8534
August	6.880	50	7.1504
September	6.958	48	7.5652
October	5.193	57	7.5603
November	6.233	43	6.8966
December	6.818	44	7.1407

Table 12 shows that the difference score compared to a patient being previously treated, has a larger number of those patients treated with 548 patients out of the 673 total.

Table 12

ANOVA – Dependent Variable (Difference Score Compared to Previous Treatment) (N=673, p=.188)

Previous Treatment for Depression	N	Mean	Std. Deviation
No	125	5.904	7.3281
Yes	548	6.878	7.4790

Table 13 shows that the difference score compared to a patient who has no change in therapy by their mental health provider a larger number of those patients did not have a change in treatment by their mental health provider.

Table 13

ANOVA – Dependent Variable (Difference Score Compared to No Change in Treamtnet by Mental Health) (N=673, p=.450)

No Change in Treatment by Mental Health Provider	N	Mean	Std. Deviation
Yes	57	5.982	8.1580
No	616	6.763	7.3908

Table 14 shows that the difference score compared to a patient who has no change in therapy by primary care provider (pcp) a larger number of those patients did not have a change in treatment by primary care provider (pcp).

Table 14

ANOVA – Dependent Variable (Difference Score Compared to No Change In Treatment by PCP) (N=673, p=0.45)

No Change in Treatment by Primary Care Provider (PCP)	N	Mean	Std. Deviation
Yes	143	5.587	7.0853
No	530	6.996	7.5307

Table 15 shows that the difference score compared to those patients who declined follow

up treatment, of the 673-total number of patients, only 9 declined treatment.

Table 15

ANOVA – Dependent Variable (Difference Score Compared to Patient Declined) (N=673,
p=.744)

Patient Declined Follow Up	N	Mean	Std. Deviation
Yes	9	5.889	6.9001
No	664	6.708	7.4669

Table 16 shows that the difference score compared to patients who had a medication

adjustment and/or change by their primary care provider (pcp), 277 of the 673-total number of

patients had a medication adjustment and/or change due to the results of the depression

screening.

Table 16

ANOVA – Dependent Variable (Difference Score Compared to PCP Medication Change)
(N=673, p=.000)

PCP Changed Medication	N	Mean	Std. Deviation
Yes	277	8.206	7.5827
No	396	5.641	7.1884

Table 17 shows that the difference score compared to patients who were referred to their

community mental health provider. Only 127 out of the 673-total number of patients were

referred to a community mental health provider.

Table 17

ANOVA – Dependent Variable (Difference Score Compared to Referred to Community Mental
Health Provider (N=673, p=.005)

Patient was referred to a Mental Health Provider	N	Mean	Std. Deviation
Yes	127	8.370	8.0077
No	546	6.308	7.2737

Table 18 shows that the difference score compared to patients who were referred to inpatient psychiatry care. Out of the entire sample of patients, no patient was referred to inpatient psychiatric care based on their depression screening.

Table 18

ANOVA – Dependent Variable (Difference Score Compared to Referred to Inpatient Psychiatry (N=673)

Patient was referred to Inpatient Psychiatry	N	Mean	Std. Deviation
Yes	0		
No	673	6.697	7.4554

The below table (Table 19) shows the multiple linear regression analysis for each independent variable (IV) and the difference score (DV). With that said, two significant independent variables were PCP initiated medication change *(b=2.5, p<0.01),* and referral to community health *(b=1.6, p=0.037)* indicating successful intervention. When the PCP initiates change in medication the depression score shows improvement by 2.5. Referral for patients to community health produces a 1.6 decrease to the depression score. The clinical interventions of initiating medication changes and referral to community health show benefit to the patient.

Table 19

Multiple Linear Regression for the Difference Score and Independent Variables

	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B	
						Lower Bound	Upper Bound
(Constant)	4.003	.986		4.062	.000	2.068	5.939
Gender	.852	.632	.052	1.349	.178	-.388	2.093
Previous Treatment	.202	.768	.011	.263	.793	-1.306	1.709
No Change in Treatment: Treated by Mental Health	.257	1.079	.010	.238	.812	-1.861	2.375
PCP Initiated Medication Change	2.495	.632	.165	3.950	.000	1.255	3.735
Referred to Community Mental Health	1.564	.748	.082	2.091	.037	.095	3.032
Age Group: 30-45	.941	.773	.058	1.217	.224	-.577	2.459
Age Group: 46-55	.013	.867	.001	.015	.988	-1.689	1.715
Age Group: 56-64	.939	1.021	.041	.920	.358	-1.065	2.943
Age Group: 65-74	.688	1.133	.026	.607	.544	-1.537	2.914
Age Group: 75-101	3.187	1.599	.081	1.994	.047	.048	6.326

Dropout Analysis

The dropout analysis was interpreted to see if they are different from people who had follow up data on because if they are different then your fingings might be biased. Table 20 – 22 show a cross tabulation between the dropout variable compared to each of the independent variables in order to show the frequencies for each. The age group between 56-74 had over 50% patients drop out, meaning they declined treatment or did not have a documented follow up. This is true also for the age group of 75-101. When compared to gender, the dropout rate was interestingly the same for both males and females. Patients who have had been previously treated for depression (44%) had a lower drop out rate than those without any documentation of previous treatment (53.4%).

Table 20

Cross Tabulation: Dropout Compared to Age (N=1,246, p=0.027)

| | | | Dropout | | |
			No	Yes	Total
Age Group	18-29	Count	165	101	266
		% within Age Group	62%	38%	100%
	30-45	Count	209	170	379
		% within Age Group	55.1%	44.9%	100%
	46-55	Count	136	136	272
		% within Age Group	50%	50%	100%
	56-64	Count	80	84	164
		% within Age Group	48.8%	51.2%	100%
	65-74	Count	58	51	109
		% within Age Group	53.2%	46.8%	100%
	75-101	Count	25	31	56
		% within Age Group	44.6%	55.4%	100%
Total		Count	673	573	1,246
		% within Age Group	54%	46%	100%

Table 21

Cross Tabulation: Dropout Compared to Gender (N=1,246, p=0.217)

			Dropout		
			No	Yes	Total
Gender	Male	Count	198	166	364
		% within Age Group	54.4%	45.6%	100%
	Female	Count	475	407	882
		% within Age Group	53.9%	46.1%	100%
Total		Count	673	573	1,246
		% within Age Group	54%	46%	100%

Table 22

Cross Tabulation: Dropout Compared to Previous Treatment (N=1,246, p=.188)

			Dropout		
			No	Yes	Total
Previous Treatment	No	Count	125	142	267
		% within Previous Treatment	46.8%	53.2%	100%
	Yes	Count	548	431	979
		% within Previous Treatment	56%	44%	100%
Total		Count	673	573	1,246
		% within Previous Treatment	54%	46%	100%

Summary

Results failed to reject H1A, there is a statistically significant association between untreated and treated patients in symptom reduction when controlling for age, gender and number of previous episodes of depression. There were no correlations between patient's gender, however age did play a significant factor. The p value shows the probability of finding the observed results when the null hypothesis of the study questions is true.

The results also supported the second research question, $H2_A$ that there is statistically significant association between completing a course of treatment from a mental health specialist and symptom reduction in comparison to not completing treatment when controlling for age, gender and number of previous episodes of depression. Referral for patients to community health produces a 1.6 decrease to the depression score. The clinical interventions of initiating medication changes and referral to community health show benefit to the patient. The results supported that treatment by the patient's primary care provider (pcp) has more benefit than mental health treatment, though both led to significant improvement.

Table 19, above, showed the multiple linear regression analysis for each independent variable (IV) and the difference score (DV). When controlling for the other independent variables, two significant independent variables were PCP initiated medication change *(b=2.5, p<0.01),* and referral to community health *(b=1.6, p=0.037)* indicating successful intervention. When the PCP initiates change in medication the depression score shows improvement by 2.5. Referral for patients to community health produces a 1.6 decrease to the depression score. The clinical interventions of initiating medication changes and referral to community health show benefit to the patient.

Depression impacts the well-being of patients. As described previously, mental health is a tremendous burden on society and by understanding if there is a correlation between standard follow up for those who screen positive could lead to standardization of treatment. Hence, this research is designed to fill a gap in understanding by focusing specifically on the outcomes of treatment after testing positive during depression screening (Pratt & Brody, 2014).

Section 4 will include information on the implications to change and ways to apply these findings into practice. Through the findings in this study I plan to provide further insight into whether intervention with positive depression screening is related to overall improved depression symptoms in the next section.

Section 4: Application to Professional Practice and Implications for Social Change

The goal of this project was to study patients who completed routine depression screenings in their primary care office. Patients who had a total score of 10 or higher on the depression screen were followed to determine whether their difference score showed any correlation with follow-up care when controlling for age, gender, and previous treatment. The expected follow-up for patients who had a positive screening was with their primary care physician or mental health counselor. Findings indicated that routine depression screening is important and that follow-up care is essential and successful.

Findings and Implications

A sample of 1,246 out of 15,784 cases was randomly chosen using SPSS software. Descriptive analyses, ANOVAs, multiple linear regression, and cross tabulations were conducted to analyze the data. A patient who completed a PHQ-9 and scored a total of 10 or higher was included in the data set (see Appendix A).

Results indicated a statistically significant association between untreated and treated patients in symptom reduction when controlling for age, gender, and number of previous episodes of depression. There was no correlation between patient's gender; however, age did play a significant factor. Results also indicated a statistically significant association between symptom reduction and completing a course of treatment from a mental health specialist when controlling for age, gender, and number of previous episodes of depression.

Results from multiple linear regression analysis indicated that PCP-initiated medication change and referral to community health were significantly associated with successful intervention when controlling for other independent variables. When the PCP initiated change in

medication, the depression score improvement by 2.5 points. Referral for patients to community health produced a 1.6 point decrease in the depression score. The clinical interventions of initiating medication changes and referral to community health were beneficial to patients.

Recommendations

Based on the results of this project, recommended practice guidelines for primary care providers include proactive, routine depression screening for all patients 18 years and older. Continuing education is recommended for clinical staff to address the burden of mental health, health diseases, signs, symptoms, and the appropriate ways to treat patients. Protocols for follow-up standardized treatment should be implemented to ensure that patients are not lost in follow-up. Implementation of recommendations should follow standards of care proposed by the American Academy of Psychology for primary care providers on how to successfully manage patients who are being treated for mental health disorders.

Recommendations for Future Research

Expanded research should be conducted on the correlation between routine screening and treatment outcomes, and whether screening is an effective way to identify patients with underlying mental health problems. Findings may be used to close the gap in care with patients who decline further depression screenings. Researchers could also examine ways to close the gap in care with patients who are lost to follow-up, including creating registries dedicated to patients with defined depression and ensuring they are being managed. This could be part of the collaborative care management process discussed in Section 1.

Strengths and Limitations

One of the strengths of this project was the robust literature review that identified the need for further research on the prevalence of depression screening in the primary care setting. Another strength was providing support for routine screening of patients for depression in the primary care setting using PHQ-9. The findings in this study further demonstrated the reliability and validity of the PHQ-9 depression screening tool.

The first limitation to this study was that the study only included 12 months of follow-up data; patients who had a follow-up after the 12-month data capture were missed. Another limitation was the literacy level of the patients who were randomly chosen. Lastly, using data from a system that has 50+ outpatient primary care settings could have resulted in accidental exclusion of patients who were offered a follow-up screening. Educating the clinical support staff and physicians on the importance of screening all patients for depression at every visit may decrease the number of patients who are lost to follow-up.

Dissemination Plan

I will share findings with my colleagues and partners at the study site to emphaize the need for change in the way depression is viewed in the outpatient setting. I plan to disseminate findings to local health care leaders with the intention to expose gaps in follow-up care and to hold clinical staff accountable for completing necessary screening. The plan for external dissemination includes presenting findings to other health care organizations and providers to raise awareness of successful routine screenings. Routine screening is essential for identifying patients who are not exhibiting symptoms. One of the significant obstacles to overcome with this issue is to ensure that the clinicians and clinical support staff are well versed on this subject and

understand the necessary protocols for follow-up treatment. It is unethical for practicing

physicians and staff members to continue losing patients to follow-up without an action plan to

help close this care gap. Findings from this project may be used to encourage health care

providers to proactively screen patients for depression and create a follow-up protocol to ensure

the patient is receiving the proper intervention to yield positive results.

Social Change Implications

Routine screening is essential for identifying patients who are not exhibiting symptoms.

In January 2016, the USPSTF recommended screening for depression in all adults (Siu &

USPSTF, 2016). Their recommendation was to screen patients before they present with

depression-like symptoms while using a validated screening tool (Siu & USPSTF, 2016). The

USPSTF also recommended that accurate diagnosis, plan of care, and routine follow-up be put in

place for the treatment to be effective (Siu & USPSTF, 2016).

Depression is one of the leading causes of disability in the United States, and screening is

beneficial in the detection of depression (Siu & USPSTF, 2016). Depression can create

difficulties at work and in people's personal lives (Siu USPSTF, 2016). However, screening is

just the beginning. Follow-up care is a crucial element in ensuring that patients receive effective

care. According to Olfson et al. (2016), 72% of patients who screen positive for depression are

not getting the follow-up care required to effectively manage and/or treat their mental illness.

One of the significant obstacles to overcome is to ensure that the clinicians and clinical

support staff are educated on the prevalence of mental health disorders. Nearly 60% of adults

with a diagnosed mental illness have not sought care in the previous year (National Alliance on

Mental Illness [NAMI], 2014). It is unethical for practicing physicians and staff members to

continue losing patients to follow-up without an action plan to close this care gap.

Mental health is one of the costliest diseases in the United States, and each year $193

billion is spent on mental health (NAMI, 2014). Findings from the current study were

statistically significant for two of the 10 independent variables including PCP-initiated

medication change and referral to community health. Findings showed that when the PCP

initiated change in medication, the depression score improved by 2.5 points. Referral of patients

to community health produced a 1.6 point decrease in the depression score. The clinical

interventions of initiating medication changes and referral to community health show benefits to

patients. Standardizing follow-up protocols for clinicians is an important aspect of successful

intervention. Depression is the primary cause for disability worldwide and is the major

contributor to global disease burden (NAMI, 2014). Findings from this study may be used to

educate clinicians and nurses on the importance of routine depression screening. The 43.8

million adults who experience mental illness each year deserve higher quality care (NAMI,

2014).

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Appendix A: Patient Health Questionnaire – 9 (PHQ-9)

PATIENT HEALTH QUESTIONNAIRE-9
(PHQ-9)

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

FOR OFFICE CODING ___0___ + _____ + _____ + _____

=Total Score: _____

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

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

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 C: Data Usage Agreement

DATA USE AGREEMENT

This Data Use Agreement ("Agreement"), effective as of **May 6, 2017** ("Effective Date"), is entered into by and between **Juli Molecavage** ("Data Recipient") and **Geisinger Health System** ("Data Provider"). The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in research in accord with the HIPAA and FERPA Regulations.

1. <u>Definitions.</u> Unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the "HIPAA Regulations" codified at Title 45 parts 160 through 164 of the United States Code of Federal Regulations, as amended from time to time.

2. <u>Preparation of the LDS.</u> Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable HIPAA or FERPA Regulations

Data Fields in the LDS. **No direct identifiers such as names may be included in the Limited Data Set (LDS).** The researcher will also not name the organization in the doctoral project report that is published in Proquest. In preparing the LDS, Data Provider or shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research: **PHQ 2_9 overall score, date of completion, patient gender, patient age, site in which the questionnaire was completed.**

3. <u>Responsibilities of Data Recipient.</u> Data Recipient agrees to:

   a.   Use or disclose the LDS only as permitted by this Agreement or as required by law;

   b.   Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

   c.   Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

   d.   Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and

   e.   Not use the information in the LDS to identify or contact the individuals who are data subjects.

4. <u>Permitted Uses and Disclosures of the LDS.</u> Data Recipient may use and/or disclose the LDS for its research activities only.

5. Term and Termination.

    a.   Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

    b.   Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

    c.   Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

    d.   For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

    e.   Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

6. Miscellaneous.

    a.   Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.

    b.   Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

    c.   No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

    d.   Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

    e.   Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

DATA PROVIDER   **DATA RECIPIENT**

Signed: _____Jean A Adams_____   Signed: Juli Molecavage
Print Name: Jean A Adams_____Print Name: Juli Molecavage

Print Title: _____ACIO_____   Print Title: ____Student_____
_____