

SCREENING FOR ADOLESCENT DEPRESSION IN A RURAL PRIMARY CARE CLINIC

A Dissertation
Submitted to the Graduate Faculty
of the
North Dakota State University
of Agriculture and Applied Science

By

Hannah Taylor Bailey

In Partial Fulfillment of the Requirements
for the Degree of
DOCTOR OF NURSING PRACTICE

Major Program:
Nursing

February 2021

Fargo, North Dakota

North Dakota State University
Graduate School

Title

Screening for Adolescent Depression in a Rural Primary Care Clinic

By

Hannah Taylor Bailey

The Supervisory Committee certifies that this *disquisition* complies with North Dakota State University's regulations and meets the accepted standards for the degree of

DOCTOR OF NURSING PRACTICE

SUPERVISORY COMMITTEE:

Dean Gross, PhD

Chair

Mykell Barnacle, DNP

Molly Secor-Turner, PhD

James Korcuska, PhD

Approved:

03/03/2021

Date

Carla Gross, PhD

Department Chair

ABSTRACT

In the United States, 11.4% of adolescents between the ages of 12-17 are diagnosed with depression each year (Leslie & Chike-Harris, 2017). Unfortunately, research shows that as many as two in three youth with depression are not identified by their primary care providers and fail to receive any kind of treatment (Zuckerbrot, Cheung, Jensen, Stein, & Laraque, 2018). The burden of depression is high during adolescence, including high rates of recurrence and elevated risk of suicide (Forman-Hoffman & Viswanathan, 2018). According to the CDC, from 2014-2016, North Dakota had a significant overall suicide rate increase of 57% throughout the state. Death rates from suicide were higher in rural areas than in urban areas during this time.

As of 2016, the United States Preventative Service Task Force recommends routinely screening all adolescents, age 12-18, for depressive disorder. The purpose of this project was to increase the rates of adolescent depression screening, detection, and intervention by rural primary care providers. Providers at the Washburn and Underwood, ND clinics participated in the project, routinely utilizing the Patient Health Questionnaire-9 modified for Adolescents (PHQ-A) screening tool and Guidelines for Adolescent Depression in Primary Care (GLAD-PC) to assist in detecting and managing depression in adolescents aged 12-18.

The project included a co-investigator led educational session in which the PHQ-A screening tool and the GLAD-PC recommendations were introduced. Screening tool and guideline implementation occurred over the following six months. Lastly, a post-implementation provider survey was conducted to further assess provider confidence and likelihood of continued use of the PHQ-A and GLAD-PC as well as any barriers encountered during the implementation period. All of the project objectives were achieved. Rates of screening for depression in adolescents aged 12-18, using the PHQ-A screening tool, increased from 0% in the 6 months

preceding the implementation period to 94% during the implementation period. Results of the post-implementation provider survey indicated increased provider confidence using the PHQ-A and GLAD-PC as well as high likelihood of continued use following the project.

ACKNOWLEDGEMENTS

I would like to acknowledge those who played a role in my academic accomplishments. The completion of this project could not have been possible without the participation and assistance of many people whose support and contributions are sincerely appreciated. My deepest gratitude is extended particularly to the following:

Dr. Dean Gross, my advisor and committee chair, who has provided me with patient advice, guidance, and encouragement throughout the duration of the research process and academic program.

Committee members Dr. Mykell Barnacle, Dr. Molly Secor-Turner, and Dr. James Korcuska whose expertise and constrictive feedback have been vital to success of the project.

The Washburn and Underwood Clinics who allowed me to implement my dissertation project at their facilities. Without their participation and support, I would not have accomplished all I have with this project.

DEDICATION

To my family who has helped me through this journey and continuously instilled confidence in my success. I am eternally grateful for the endless love, patience, support and encouragement to pursue my dreams.

TABLE OF CONTENTS

ABSTRACT	iii
ACKNOWLEDGEMENTS	v
DEDICATION	vi
LIST OF TABLES	x
CHAPTER ONE: INTRODUCTION.....	1
Background	1
Risk and Protective Factors	2
Diagnosis	5
Significance	5
Statement of the Problem	6
Healthy People 2020.....	7
North Dakota	9
Project Description	9
Project Purpose	9
Project Objectives.....	10
CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK.....	12
Literature Review	12
Relevance to Primary Care	12
Guidelines	14
Screening	15
Treatment.....	18
Psychotherapies	20
Pharmacotherapy	21
Theoretical Framework	22

Roger’s Diffusion of Innovation Theory	22
The Iowa Model	23
CHAPTER THREE: PROJECT DESIGN AND IMPLEMENTATION	25
Project Design	25
Methods.....	25
Setting.....	26
Evaluation.....	27
Data Collection.....	29
Protection of Human Subjects.....	29
CHAPTER FOUR: RESULTS	30
Presentation of Findings.....	30
Objective One.....	31
Objective Two	32
Objective Three	32
CHAPTER FIVE: DISCUSSION AND RECOMMENDATIONS	35
Interpretation of Results	35
Objective One.....	35
Objective Two	36
Objective Three	37
Evaluation of Theoretical Framework.....	37
Limitations	39
Recommendations	41
Implications for Practice	42
New Findings.....	42
Dissemination	45

Implications for Future Research	45
Application to Nurse Practitioner Role	46
REFERENCES	48
APPENDIX A. PHQ-A.....	54
APPENDIX B. THE IOWA MODEL REVISED	55
APPENDIX C. POST-STUDY PROVIDER ASSESSMENT TOOL	56
APPENDIX D. CLINICAL ASSESSMENT FLOWCHART	57
APPENDIX E. CLINICAL MANAGEMENT FLOWCHART.....	58
APPENDIX F. PERMISSION TO USE IOWA MODEL.....	59
APPENDIX G. AGENCY LETTER OF SUPPORT.....	60
APPENDIX H. LOGIC MODEL	61
APPENDIX I. IRB APPROVAL.....	62

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. MHMD-2: Reduce suicide attempts by adolescents.....	8
2. MHMD-4.1: Reduce the proportion of adolescents aged 12 to 17 years who experience major depressive episodes (MDEs)	8
3. MHMD-11.2: Increase the proportion of primary care physician office visits where youth ages 12 to 18 years are screened for depression	8
4. Self-administered screening tools.....	17
5. Treatment recommendations.....	20
6. Roger’s Diffusion of Innovation Theory: Phases of the decision process.....	23
7. The Iowa Model implementation.....	24
8. Post-implementation survey results	34
9. MHMD-02: Reduce suicide attempts by adolescents.....	44
10. MHMD-08: Increase the proportion of primary care physician office visits where adolescents and adults are screened for depression	44
11. MHMD-06: Increase the proportion of adolescents with depression who get treatment	44

CHAPTER ONE: INTRODUCTION

Background

Recent studies have identified the largest burden of disease among young people as mental health problems, including depression (Gedhill & Hodes, 2015). Depression is a disorder of the brain that may be caused by genetic, biological, environmental, and psychological factors (National Institute of Mental Health, 2019). Depression often begins in teens and young adults however it may begin at any age. More than 19 million teens and adults in the United States are affected by depression. Symptoms are persistent and may interfere with everyday life. Symptoms may include feeling sad or "empty"; loss of interest in favorite activities; overeating or not wanting to eat at all; not being able to sleep or sleeping too much; feeling very tired; feeling hopeless, irritable, anxious, or guilty; aches or pains, headaches, cramps, or digestive problems; and thoughts of death or suicide (National Institute of Mental Health, 2019). In the United States, 11.4% of adolescents between the ages of 12-17 are diagnosed with depression each year (Leslie & Chike-Harris, 2017). In community samples, up to 20% of children under the age of 18 have been found to have depression revealing that depression may be significantly underdiagnosed. The burden of depression is high during childhood, including high rates of recurrence, elevated risk of suicide, poor social and school functioning, relationship problems, and obesity (Forman-Hoffman & Viswanathan, 2018).

In adulthood, depressive disorders are the main cause of absence in the workplace (Bodden, Stikkelbroek, & Dirksen, 2018). The mean number of days of absence from work of individuals suffering from depression is 35.3, 22.8 days more than those without a diagnosis of a depressive disorder. In addition, those with depression often exhibit unhealthy lifestyles and are less compliant with medical treatments for physical complaints. As a result, along with the added

risk of suicide, the chance of premature death is 1.65 times higher in adults experiencing depression than those without a depressive disorder (Bodden, Stikkelbroek, & Dirksen, 2018).

Adolescent depression is a significant problem that must be addressed in order to reduce the burden of disease in adulthood. Screening for depression in primary care settings can lead to increased identification and potential intervention of depression in the adolescent population.

Risk and Protective Factors

Efforts to predict and prevent depression in adolescents are enhanced when risk factors have been identified (Kassis, Artz, & White, 2017). A variable is deemed a risk factor when it is shown to precede a negative outcome. Negative outcomes threaten emotional stability and result in higher depression levels. Along with risk factors, an individual also possesses some level of protective factors. Protective factors interact with risk factors to counter negative outcomes and act as a buffer against depression. Protective factors may include individual coping skills, stable home life, consistent parenting style, safe communities, and optimism.

Individual and family factors have an impact on adolescent depression (Kassis et al., 2017). Individuals with low self-esteem, lack of optimism, and negative self-concept are at higher risk for depression (Thummathai, Sethabouppha, Chanprasit, & Lasuka, 2018). Family conflict, separation, divorce, re-marriage, and parental death may also contribute to an adolescent's risk of developing depressive symptoms. In addition, children of mentally ill parents are found to be at a heightened risk for depression (Kassis et al., 2017). The increased risk is likely due to both environmental and genetic factors. Parents with depression tend to display more negative, critical, withdrawn and inconsistent parenting styles that have adverse effects on children. Offspring of parents with a history of depression are 2-3 times more likely to develop depression than children of parents with no history of depression (Dunn et al., 2015).

Demographic

Adolescents are at a higher risk for depression than the adult population (Dever, 2016). The onset of depression increases around puberty (Boyd, Lewis, Borreggine, & Benton, 2018). Females are particularly affected at the onset of puberty (Kassis, Artz, & White, 2017). During adolescence, females are 2-3 times more likely to have major depressive disorder, due to a variety of factors (Boyd et al., 2018). Girls' bodies move away from the thin ideal during puberty which contributes to body dissatisfaction for some (Kassis et al., 2017). Body dissatisfaction includes negative thoughts and feelings about one's physical appearance that lead to low self-esteem. As previously mentioned, low self-esteem places one at higher risk for depression. Along with physical changes, hormonal changes also influence the higher rate of depression in adolescent girls (Gledhill & Hodes, 2015).

Comorbidities

Suffering from a chronic disease has been confirmed as a risk factor for development of depressive disorders in all individuals, including adolescents (Boyd et al., 2018). Dever (2016) emphasized that adolescents with chronic conditions are at a high risk for depressive disorders. Dever's work with the diabetic adolescent population was a prime example of chronic disease and the associated risk of depression. Children with Type 1 Diabetes were studied until age 18 and found to have an increased risk of psychiatric disorders such as anxiety, attention deficit hyperactive disorder (ADHD), eating disorder, mood disorder, and substance misuse when compared to their healthy siblings. Mood disorders, including depressive disorder, were the second most prevalent psychiatric disorder among the diabetic population studied, following substance misuse. The risk of psychiatric morbidity doubled throughout the observation period.

Socioeconomic Status

A study conducted by Hoffmann, Farrell, and Monuteaux (2020) examined the association between pediatric suicide and county level poverty concentration in the United States. In the study, county poverty concentration was divided into 5 categories: 0% to 4.9%, 5.0% to 9.9%, 10.0% to 14.9%, 15.0% to 19.9%, and 20% or more of county households. Among US youths aged 15 to 19 years, counties with a poverty concentration of 10.0% or more were found to have higher suicide rates. Suicide rates were found to increase in a stepwise manner with increased poverty concentration. Increased adversities experienced by children living in poverty including higher rates of chronic disease, family turmoil, social isolation, lack of positive peer influences, and violence may lead to emotional disturbance and ultimately suicidality (Hoffmann, Farrell, & Monuteaux, 2020). In addition, areas of concentrated poverty may lack quality schools, sustainable jobs, healthcare facilities, and mental health resources that support good health. These adversities result in long term exposure to toxic levels of stress which may affect neurobiological stress-mediated pathways in early brain development. Alterations in stress-mediated pathways may ultimately lead to impaired decision-making, behavioral self-regulation, and mood or impulse control resulting in increased suicide risk (Hoffmann, Farrell, & Monuteaux, 2020).

Rural Suicide Risk

Significant mental health disparities exist between urban and rural settings, as evidenced by suicide mortality rates. Suicide rates in the adolescent population are significantly higher in rural areas. According to Goldman-Mellor, Allen, and Kaplan (2017), adolescent suicide rates in rural areas are 84% higher than in urban areas. Geographic variations in suicide prevalence may be explained by multiple sociodemographic factors (Helbich et al., 2017). Those living in rural

areas have less access to health services due to location, are of lower socio-economic status, may have increased stigmatization of mental disorders, and may face social isolation due to location (Jones et al., 2015). Each of these are risk factors for poor mental health outcomes. Rural adolescents may also be less likely to report suicidal behavior compared to urban adolescents (Goldman-Mellor et al., 2017). In addition, those living in rural areas have easier access to lethal means which also increase their suicide risk (Helbich et al., 2017). Although Kassis et al. (2017) identified protective factors for depression and suicide such as individual coping skills, stable home life, consistent parenting style, safe communities and optimism, additional review of current literature failed to differentiate protective factors that are unique to the rural setting.

Diagnosis

The Diagnostic and Statistical Manual of Mental Disorders (DSM- 5) is used to diagnose mental health disorders such as depression (American Psychiatric Association, 2015). In order to obtain a diagnosis of depression, an individual must fit criteria listed in the manual relating to mood, pleasure, appetite, sleep, restlessness, fatigue, feelings of worthlessness, ability to think/concentrate, and thoughts of death. This is applicable to both the pediatric and adult populations. The most common depressive disorder diagnosed in adolescents is major depressive disorder (Boyd et al., 2018) Other depressive disorders which may be diagnosed during adolescence include persistent depressive disorder, disruptive mood dysregulation disorder, premenstrual dysphoric disorder, and specified/ unspecified depressive disorder.

Significance

Half of all mental disorders in adults have onset before the age of 14 years (Gedhill & Hodes, 2015). Throughout child development, the prevalence of childhood depression increases (Forman-Hoffman & Viswanathan, 2018). In 2017, the National Survey on Drug Use and Health

(NSDUH) gathered valuable information regarding major depressive disorders in the United States (National Institute of Mental Health, 2017). The study definition of a major depressive episode was based on the Diagnostic and Statistical manual of Mental Disorders (DSM-5) criteria. The study revealed that an estimated 3.2 million adolescents aged 12 to 17 experienced at least one depressive episode. Overall, 60.1% of adolescents with major depressive disorder did not receive treatment. Depression occurring in adolescence or before age 18 is considered early onset (Gedhill & Hodes, 2015). Early onset depression is more severe, chronic and often leads to depressive illness in adulthood. Depression can reduce quality of life significantly and even lead to suicide in severe cases (Kassis et al., 2017). Suicide is defined as “death caused by self-directed injurious behavior with intent to die as result of the behavior” (National Institute of Mental Health, 2019, p.1). Worldwide, suicide is the leading cause of death for those age 15-29 (Kassis et al., 2017). According to the National Institute of Mental Health (2019), suicide was the tenth leading cause of death overall in the United States in 2017. Suicide claimed the lives of over 47,000 people. Suicide was the second leading cause of death for those between the ages of 10 and 19, second only to unintentional injury. In 2017, there were twice as many suicides in the United States as there were homicides. A review conducted by Bodden, Stikkelbroek, and Dirksen (2018) revealed that nearly 60% of depressed adolescents reported experiencing suicidal thoughts. Of those endorsing suicidal thoughts, 30% reported a previous suicide attempt. Identification and treatment of adolescent depression must be addressed by providers in primary care to prevent further burden of disease and comorbidities.

Statement of the Problem

Depression in adolescence is a condition that needs to be properly identified and treated (Boyd et al., 2018). Adolescent onset depression is strongly associated with recurrent and

chronic depression in adulthood. Current studies recognize depression as the leading cause of burden of disease among young people. Unfortunately, research shows that only 50% of adolescents with depression are diagnosed before adulthood (Zuckerbrot, Cheung, Jensen, Stein, & Laraque, 2018). As many as two in three youth with depression are not identified by their primary care providers and fail to receive any kind of treatment. Additionally, when diagnosed by primary care providers, only half of patients are treated appropriately (Forman-Hoffman & Viswanathan, 2018). Early identification of depression in the adolescent population is necessary in order to reduce future burden of disease. It is crucial that primary care providers are confident and competent to identify and manage youth depression, especially those working in rural settings.

Healthy People 2020

According to the U.S. Department of Health and Human services (2017), the Healthy People initiative provides 10-year national objectives for improving the health of all Americans. Objectives are science based and strive to identify nationwide health improvement priorities, increase public awareness and understanding of the determinants of health, social disparities, disease, and disability and the opportunities for progress. Currently, Healthy People 2020 contains the most recent goals and objectives. The overall 2020 goal for adolescent health is to improve the healthy development, health, safety, and well-being of adolescents and young adults. Although adolescence and young adulthood are generally healthy times of life, some important health and social problems either start or peak during these years including mental disorders, substance use, academic problems and dropping out of school, and suicide. In order to address these problems, multiple objectives were set relating to adolescent mental health including the following as detailed in the tables 1-3.

Table 1

MHMD-2: Reduce suicide attempts by adolescents

Baseline:	1.9 suicides per 100 population occurred in 2009
Target:	1.7 suicides per 100 population
Target-Setting Method:	10 percent improvement
Progress:	Suicide rates have increased from 1.9 per 100 population in 2009 to 2.4 per 100,000 population in 2017

Table 2

MHMD-4.1: Reduce the proportion of adolescents aged 12 to 17 years who experience major depressive episodes (MDEs)

Baseline:	8.3 percent of adolescents aged 12 to 17 years experienced a major depressive episode in 2008
Target:	7.5 percent
Target-Setting Method:	10 percent improvement
Progress:	Occurrences of major depressive episodes in adolescents age 12-17 have increased from 8.3 percent in 2008 to 14.4 percent in 2018

Table 3

MHMD-11.2: Increase the proportion of primary care physician office visits where youth ages 12 to 18 years are screened for depression

Baseline:	1.6 percent of primary care physician office visits included screening for depression in youth aged 12 to 18 years in 2010–12
Target:	1.7 percent
Target-Setting Method:	10 percent improvement
Progress:	Not documented

U.S. Department of Health and Human services (2017)

Adolescent mental health objectives have not been met since release of the 2020 healthy people objectives. In reviewing the data, it is noted that both suicide rates and incidences of

major depressive episodes in adolescents have continued to increase. This emphasizes the need for added screening/intervention. Universal screening in the primary care setting is essential in identifying youth depression in order to reduce rates of suicide and implement treatment methods to reduce and prevent future episodes of depression.

North Dakota

The Youth Risk Behavior Survey (YRBS) was developed in 1990 by the Centers for Disease Control and Prevention (North Dakota Department of Public Instruction, 2019). The goal of the survey is to increase our understanding of behaviors that contribute to the leading causes of death, disability and social problems among students. North Dakota began participating in the YRBS survey in 1995. Middle school and high school students are surveyed every other year. The survey is voluntary and responses are completely anonymous. Most recently, the 2019 YRBS was conducted which revealed that occurrences of depression and suicide attempts are on the rise in North Dakota's youth. The percentage of middle school students who reported ever trying to kill themselves increased from 6.0% in 2009 to 10.3% in 2019. The percentage of high school students who reported feeling sad or hopeless (almost every day for 2 or more weeks in a row so that they stopped doing some usual activities ever during the 12 months before the survey) has risen from 22.9% in 2009 to 30.5% in 2019. Also, the percentage of high school students who attempted suicide (one or more times during the 12 months before the survey) has increased from 5.7% in 2009 to 13.0% in 2019.

Project Description

Project Purpose

According to the United States Preventative Service Task Force (2016), screening tests can accurately detect depressive disorder in the adolescent population. As of 2016, the United

States Preventative Service Task Force (USPSTF) recommends routinely screening all adolescents, aged 12-18 years, for depressive disorder. Screening tools should be provided to all primary care providers to improve occurrence of depression identification in the adolescent population (Dever, 2016). The purpose of this project is to increase the rates of adolescent depression screening, detection, and intervention by rural primary care providers. Screening tools will be discussed in further detail however, the USPSTF recommendation promotes use of self-administered screening tools such as the Patient Health Questionnaire for Adolescents (PHQ-A) in the primary care setting. The Washburn and Underwood, ND clinics did not conduct routine screening for depression in the adolescent population. A review of the electronic health record during the 6-month period prior to project implementation revealed that none of the 99 patients, aged 12-18, seen by a primary care provider at the Washburn and Underwood clinics were screened for depression using a self-administered screening tool. For this reason, the PHQ-A screening tool for depression will be implemented at the Washburn and Underwood, ND clinics to all adolescents ages 12-18 at the beginning of each visit. After screening is completed, provider interventions will be guided by the Guidelines for Adolescent Depression in Primary Care (GLAD-PC). With increased detection of depression, the co-investigator anticipates an increase in the incidence of diagnosis and intervention for depressive symptoms in the targeted adolescent population.

Project Objectives

1. In six months, following the implementation of the PHQ-A, the number of adolescents (aged 12-18) completing routine screening for depression will increase to 75% or greater.
2. Primary care providers in a rural primary care clinic will report an increase in confidence screening for depression in 12-18-year-old patients.

3. Primary care providers in a rural primary care clinic will report an increase in confidence using the GLAD-PC recommendations for adolescent depression management.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

A variety of current literature was examined to gain a better understanding of adolescent depression. Sources were selected based on their relevance to the topic. Key terms used to guide the search for literature included: *depression, adolescent, screening, prevalence, treatment, and prevention*. Databases in association with the North Dakota State University libraries website were searched including CINAHL, PubMed, Academic Search Premier (EBSCO), ScienceDirect (Elsevier) and Ovid- Lippincott Williams &Wilkins. The following criteria was used in limiting searches:

- Full text available
- Written in the English language
- Literature published between 2015 and 2019
- Literature from journal articles, reports, and practice guidelines
- Information relevant to depression in adolescents

Exclusion Criteria

- Information relevant to only the adult population
- Information relevant to only those under the age of 12

Literature Review

Relevance to Primary Care

The primary care provider may be the only healthcare provider who comes in contact with the adolescent (Gledhill & Hodes, 2016). Primary care providers are able to form long standing relationships with their patients which helps to detect depression in the earliest stages (Forman-Hoffman & Viswanathan, 2018). In addition, primary care providers are able to consult with caregivers who accompany patients to appointments and follow up on complaints

previously reported. Often, adolescents with depression present with problems including poor school performance or attendance, increased outbursts, unexplained somatic symptoms, or substance abuse. Studies have indicated an increase in visits to the primary care provider for non-mental health related complaints in the year prior to suicide (Leslie & Chike-Harris, 2017). This emphasizes the need for detection and intervention of depression in the primary care setting.

Rural North Dakota

The Biennial Report, published by the University of North Dakota School of Medicine and Health Sciences, is completed every two years with the goal of addressing health issues for the state of North Dakota (University of North Dakota, 2019). Among other topics, the report provides valuable information pertaining to the healthcare needs and disparities in rural North Dakota. According to the report, rural areas are defined as those with a population fewer than 10,000. Historically, more than 50% of North Dakota's population is designated as rural. Rural North Dakotans face more constraints in accessing care and achieving acceptable health outcomes, leading to health disparities. Health disparities are significant differences between populations, including the incidence and prevalence of mortality and burden of disease. Demographic characteristics may contribute to rural health disparities. In general, those in the rural areas of North Dakota are older, poorer, and have less insurance coverage than those in urban areas. Access to care including the availability of health professionals, specialty services, and healthcare facilities is also limited in rural areas. Along with the demographic characteristics previously mentioned, natural barriers such as distance, weather and road conditions all hinder access to care in the rural setting.

Health disparities of North Dakotan's are addressed in detail in the Biennial Report (University of North Dakota, 2019). Behavioral health conditions, including suicide, are

discussed in terms of prevalence and burden. Currently, for young people between the ages of 15-24 in North Dakota, suicide is the second leading cause of death. According to the CDC, from 2014-2016, suicide rates increased across most states. During this time, North Dakota had a significant overall suicide rate increase of 57% throughout the state. Death rates from suicide were higher in rural areas than in urban areas during this time. Despite the increasing and continued need for behavioral health services in rural areas, access to specialty providers remains limited. According to the report, only 9 of 53 counties in North Dakota provide access to psychiatry services. Despite the overall workforce shortage there are currently primary care providers, including physicians and nurse practitioners, providing services in all 53 counties in North Dakota. This further emphasizes the need for integration of behavioral health services into primary care. Primary care providers are in a position to identify and assist youth with depression, especially when access to mental health specialty providers is limited (Zuckerbrot et al., 2018).

Guidelines

In 2007, due to the shortage of mental health clinicians, the barriers to children's access to mental health professionals, and need for primary care clinicians to learn how to manage adolescent depression, multiple agencies partnered to develop the GLAD-PC. In 2018, the Guidelines for Adolescent Depression in Primary Care (GLAD-PC) were published (Zuckerbrot et al. 2018). The guidelines are based on available research and the consensus of experts in adolescent depression and primary care including the Center for the Advancement of Children's Mental Health at Columbia University, the Sunnybrook Health Sciences Center at the University of Toronto, the New York Forum for Child Health, the New York District II Chapter 3 of the American Academy of Pediatrics (AAP), and the Resource for Advancing Children's Health

(REACH) Institute. The guidelines include recommendations for the primary care provider regarding identification and care of youth with depression. The GLAD-PC is a valuable tool for planning and implementing the practice improvement project as it provides a comprehensive source of evidence-based information.

Screening

Early detection of depression allows for the possibility of diminishing the negative consequences of depression (Thummathai et al., 2018). The United States Preventative Service Task Force (USPSTF) found that screening tests can accurately detect depressive disorder in the adolescent population (Dever, 2016). As of 2016, the USPSTF recommends routinely screening all adolescents, age 12-18, for depressive disorder. The benefits of screening all adolescent patients for depression outweigh the potential harms of screening those without known risk factors when systems are in place to provide adequate follow up assessment and care (Forman-Hoffman & Viswanathan, 2018). Because adolescents often have infrequent provider visits, screening for depression at every visit regardless of chief complaint is recommended (Leslie & Chike-Harris, 2017). Additionally, universal screening protocols have been shown to increase communication between the provider, patient, and caregiver regarding mental health concerns. Screening tools should be provided to all primary care providers to improve occurrence of depression identification in the adolescent population. Although primary care providers generally report that screening for depression is accepted by patients and caregivers, some report barriers to implementation of screening tools including lack of training and confidence in depression assessment and management, time during appointments, and scarce referral and follow up resources (Forman-Hoffman & Viswanathan, 2018). Despite the fact that screening for adolescent depression in primary care is strongly recommended, rates remain low at around 25%

(Harder, Barry, French, Consigli, & Frankowski, 2019). Providers must be reassured that collaborative care based in primary care is crucial and has been shown to dramatically improve outcomes for adolescent depression (Brent, 2016).

Studies suggest that the use of patient self-administered screens are more sensitive in recognizing mental health disorders when compared with routine assessment by providers as they offer more privacy (Leslie & Chike-Harris, 2017). According to the Guidelines for Adolescent Depression in Primary Care (GLAD-PC) there is insufficient evidence to recommend one self-administered tool over the others (Zuckerbrot et al., 2018). The guidelines suggest use of the Columbia Depression Scale- Teen Version, Kutcher Adolescent Depression Scale, or the Patient Health Questionnaire-9: Modified for adolescents (PHQ-A) to screen for adolescent depression. Self-administered tools are further described in Table 4. Providers should implement whichever tool best fits their practice (Forman-Hoffman & Viswanathan, 2018). Factors to consider when selecting a tool include length of the tool, time it takes to administer, ease of interpretation, and costs associated with the tool.

Table 4

Self-administered screening tools

Screening Tool	Sensitivity	Specificity	# of questions	Benefits	Drawbacks
PHQ-2	83% (Score of 3 points or more)	92% (Score of 3 points or more)	2	Fast and easy	Must be followed by another tool if screening is positive Does not indicate severity of depression
PHQ-A	73%	94%	13	Directly reflects the DSM-5 diagnostic criteria Scoring is easily applied to GLAD-PC treatment guidelines Indicates severity of depression Modified from the PHQ-9 to better fit the adolescent	Longer than some other tools
Columbia Depression Scale- Teen Version	83%	82%	22	Straightforward yes/no questions Includes optional assessment to be completed by parents in addition to teen assessment	Lengthy Indicates presence of depression but does not indicate severity of depression
Kutcher Adolescent Depression Scale	92%	71%	6	Shorter than some other tools Straightforward scoring	May rule out depression but does not indicate severity when positive

(Roseman et al., 2016)

The PHQ- 9 modified for adolescents (PHQ-A) is a 13-item questionnaire that has been validated for use in patients between the ages of 12-18 (Kelly, 2019). The tool takes less than 5 minutes to complete and was adapted and modified from the PHQ-9 which is widely used in the adult population. Much like the PHQ-9, each of the first nine questions of the PHQ-A (Appendix A) assess for functional impairment of depression and correlate to the nine diagnostic criteria in the DSM-5 for major depression. Each item is rated on a scale ranging from 0-Not at all, 1-

Several Days, 2-More than half the days to 3-Nearly every day. PHQ-9 total scores range from 0-27 with a score of 5-9 indicating mild depression, 10-14 indicating moderate depression, 15-19 indicating moderately severe depression, and 20-27 indicating severe depression. Following the first nine questions, the PHQ-A includes four additional items that addresses dysthymia throughout the past year, extent of symptoms interfering with daily life, thoughts of suicide, and past suicide attempts (Clinton & Kaszuba, 2015). The tool is distinctive because it not only screens for depression but provides a measure of severity based on the scoring system. Although multiple screening options are suggested by the GLAD-PC, the PHQ-A is the most suitable for this project. The short amount of time required to administer, ability to provide a measure of depression severity, correlation with the DSM-5 diagnostic criteria, and high sensitivity make the PHQ-A an ideal tool for use in this practice improvement project. In addition, GLAD-PC treatment recommendations are guided by scores on the PHQ-9. Since the PHQ-A uses the same scoring system as the PHQ-9, interpretation of the tool to determine appropriate treatment interventions is straightforward and efficient. The PHQ-A is publicly available and no permission is required to use, reproduce, or distribute the tool.

Treatment

Overall, depression is undertreated throughout the lifespan (Gledhill & Hodes, 2015). In 2016, only 40.9 % of adolescents diagnosed with major depression received treatment (Forman-Hoffman & Viswanathan, 2018). On average, only 25% of adolescents with mental health disorders access a specialized mental health provider such as a psychiatrist, psychologist, psychiatric mental health nurse practitioner, or behavioral therapist (Reardon et al., 2017). Being Caucasian, having insurance, and living in an urban area all increase the likelihood of accessing specialist services for treatment. Although only a minority of young people access specialist

mental health services, many visit primary care (Glehill & Hodes, 2015). Early identification and treatment of depression may prevent more significant episodes in the future (Dever, 2016).

A study conducted by Reardon et al. (2017) investigated caregiver's perceived barriers to accessing treatment. The study reviewed parental perceptions of barriers to their adolescents' access to mental healthcare services. Many parents reported not knowing how or where to seek help as a barrier to treatment. Additionally, parents reported barriers such as the cost of accessing services, long waits to access services and location of the service provider. The study also evaluated parental attitudes about mental health. Parental attitudes have been shown to influence utilization of mental health services. Influences on neglecting help-seeking decisions included negative perceptions of mental health services, perceived stigma associated with mental health problems, and belief that mental health problems are caused by the adolescent's personality or relational issues. In addition to the beliefs of their caregivers, adolescents with depression have cited perceived barriers to seeking mental healthcare including embarrassment, stigma, desire to handle problems without outside help, lack of perceived need, and misperception about consequences of treatment (Leslie & Chike-Harris, 2017). As mentioned in the Biennial Report (University of North Dakota, 2019), rural adolescents face additional natural barriers that hinder access to care such as distance, weather, and road conditions. Many of these barriers reinforce the need for routine depression screening as well as the importance of the role of primary care providers in managing adolescent depression.

There has been a rapid growth in the development of treatment for mental health disorders in adolescents in recent decades (Reardon et al., 2017). As previously discussed the GLAD-PC, developed in 2018, includes recommendations for the primary care provider regarding identification and care of youth with depression (Zuckerbrot et al., 2018). According to

the guidelines, treatment will vary depending on the adolescent’s level of depression however the primary care provider is qualified to manage initial interventions for depression including supportive counseling and first line medications. Mental health specialists should be consulted for implementation of psychotherapies and second-line medication use. The GLAD-PC treatment recommendations are summarized in table 5.

Table 5

Treatment recommendations

	PHQ-A score	Treatment recommendation
Mild depression	5-9	Watchful waiting Identify peer and adult support networks Encourage exercise and other healthful activities Follow up visit in 6-8 weeks (if symptoms persist consider evidence-based treatment for depression)
Moderate depression	10-14	Combination of medication and /or psychotherapies Initially, therapy may be considered on its own however if the adolescent does not respond the addition of medication should be strongly considered.
Moderately severe and Severe depression	15-19 and 20-27	Medication is initial treatment Therapy may be initiated as soon as the severity of symptoms decreases

(Boyd et al., 2018)

Psychotherapies

Cognitive Behavioral Therapy (CBT) and Interpersonal Psychotherapy (IPT) are two of the most commonly utilized psychotherapies (Boyd et al., 2018). Both therapies are typically performed in the specialty setting by a psychotherapist and limited studies are available supporting use in the primary care setting. CBT is based on the social learning theory and focuses on the relationship between thoughts, feelings, and behavior (Gledhill & Hodes, 2015). Skills that are taught in CBT include identifying and modifying thoughts that may lead to

depressed mood, encouraging activities that promote positive mood, increasing and improving social interaction, and improving conflict resolution and problem-solving skills to promote better coping with negative life events (Boyd et al., 2018). Of all psychotherapies, CBT holds the strongest evidence base for treatment of depression (Gledhill & Hodes, 2015). CBT has been shown to have a role in preventing recurrence of depression after remission and preventing new onset in high risk adolescents. IPT focuses on the links between interpersonal relationships, emotions, and affect (Boyd et al., 2018). Each session, an interpersonal problem area is defined and techniques are used to practice skills and strategies useful in targeting the identified problem area. Strategies and techniques such as modeling, role-playing, communication analysis, and interpersonal problem solving are used.

Pharmacotherapy

The use of pharmacotherapy in adolescents is determined by duration and severity of depression, comorbidity, and history of response to other treatments and antidepressants (Gledhill & Hodes, 2015). As previously mentioned, the GLAD -PC recommends SSRIs as the drug of choice based on recent studies with fluoxetine and escitalopram being the only drugs approved by the Food and Drug Administration (FDA) for use in adolescents with depression (Zuckerbrot et al., 2018). After treating the adolescent with medication for 2-3 weeks, some positive response should be noted. If no positive response is noted after 2-3 weeks, medication dose should be increased. The full effects of SSRI medication should be seen after 4-6 weeks of medication therapy. Throughout medication initiation and dose adjustment, the provider should follow up in person or by phone every 2-4 weeks. Visits may be more frequent if preferred by the patient or provider. SSRIs should be continued for 6-9 months following a response to treatment.

In 2004, the FDA issues a black box warning indicating that antidepressants were associated with an increased risk of suicidality in young people. Since then, there has been a decline in prescription of antidepressants in the adolescent population (Forman-Hoffman & Viswanathan, 2018). Primary care providers commonly cite their belief that pharmacologic treatment can increase suicidality as a barrier to prescribing medications with known efficacy (Brent, 2016). Use of an SSRI has shown no significant difference in the occurrence of suicidal ideation than a placebo in the adolescent population and benefits of use outweigh potential risks (Gledhill & Hodes, 2015).

Theoretical Framework

Roger's Diffusion of Innovation Theory

Diffusion refers to the process occurring as people adopt new ideas or practice (Kaminski, 2011). Everett Rogers depicted this process using a variety of figures. In one of the figures, five adopter categories are displayed on a bell-shaped curve. The adopter categories include innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%), and laggards (16%). Although the project sample size is only 4 nurse practitioners, the adopter categories may be useful to guide project implementation. The co-investigator's role as an innovator will be to propose the practice improvement interventions. The co-investigator will then focus efforts on identifying one nurse practitioner who will serve as a project champion and early adopter. The early adopter is likely to persuade the three remaining nurse practitioners, who may prefer the status quo or be skeptical of change, to embrace the change and support success of the project by embracing the change and sharing evidence of the intervention's effectiveness.

Rogers' Diffusion of Innovation Theory also uses a figure to introduce five phases of the decision process in relation to change (Kaminski, 2011). The phases include knowledge,

persuasion, decision, implementation, and confirmation (Barrow & Butler, 2018). These stages may be used to structure and guide the planning and implementation of change. In this practice improvement project, the behavior of the primary care provider must be changed in regard to screening and managing adolescent depression. The five phases of the decision process are useful in guiding the progression of the proposed change and described in Table 6.

Table 6

Roger's Diffusion of Innovation Theory: Phases of the decision process

Knowledge	Primary care providers at the Washburn and Underwood clinics must first be educated about the topic of adolescent depression and the need for screening and intervention.
Persuasion	After the providers are presented information, they will discuss the need for routine screening for adolescent depression and use of the Guidelines for Adolescent Depression in Primary Care (GLAD-PC) in their clinic setting. Hopefully, if any of the providers are reluctant to implement the change, the co-investigator and supporting peers will persuade them to accept the intervention by building a case through evidence.
Decision	Ultimately, the providers will decide if they are accepting of the interventions and will allow for implementation of the interventions at their clinics
Implementation	The PHQ-A screening tool for adolescent depression and GLAD-PC will be routinely implemented in visits for adolescent ages 12-18 years old.
Confirmation	Following the implementation period, the co-investigator will evaluate provider confidence using the PHQ-A screening tool and GLAD-PC. Provider reported increase in confidence using the screening tool and GLAD-PC will demonstrate confirmation. With increased confidence, providers are likely to continue to routinely utilize the PHQ-A and GLAD-PC following the project. Continued use will confirm acceptance of the change intervention.

The Iowa Model

The Iowa Model of Evidence-Based Practice to Promote Quality Care (Appendix B) was originally developed in 2001 and is widely used to guide decision making about clinical practice changes (Melnik & Fineout-Overholt, 2015). The model outlines multiphase change and is based on the problem-solving steps in the scientific process. In 2015 The Iowa model of Evidence- Based Practice was revised to better fit the changing healthcare arena (Iowa Model Collaborative, 2017). The revised model includes several steps that facilitate practice change based on research findings. Permission to use The Iowa Model Revised was obtained from the

University of Iowa Hospitals and Clinics (Appendix F). The Iowa Model Revised will be useful in guiding the project and steps will be applied as described in Table 7.

Table 7

The Iowa Model implementation

Identifying Triggering Issues/ Opportunities	As of 2016, the United States Preventative Service Task Force (USPSTF) recommends screening all adolescents, age 12-18, for depressive disorder. Unfortunately, routine screening is not common practice in all clinical settings. The Washburn and Underwood Clinics did not routinely implement screening for depression in the adolescent population.
State the Question or Purpose	The purpose of the project is described by three objectives mentioned previously. The goals of the project are to increase the rate of adolescent depression screening, increase provider confidence in screening for adolescent depression, and increase provider confidence in using the Guidelines for Adolescent Depression in Primary Care (GLAD-PC).
Forming a Team	The team will consist of advanced practice nurses at the Washburn and Underwood Clinics, clinic support staff, supervisory committee members and myself. The co-investigator role will be to facilitate implementation of the project at the clinics and evaluate results following project implementation. Clinic staff will be responsible for ensuring that screening is administered and documented. Supervisory committee members include Dean Gross as chair from the School of Nursing, Mykell Barnacle and Molly Secor-Turner from the School of Nursing, and James Korcuska from the School of Education serving as the graduate appointee.
Assembling, Appraising, and Synthesizing Body of Evidence	A thorough literature review and synthesis was completed providing sufficient evidence to support practice change. The literature review investigated relevance of the topic to primary care in rural North Dakota. The Biennial Report (2019) published by the University of North Dakota School of Medicine and Health Sciences was reviewed, providing evidence of health disparities in rural North Dakota such as increased rates of suicide in young adults and limited access to mental health services. Appropriate screening tools for the adolescent population were identified and compared. Ultimately, the PHQ-A was selected for use in the project. In order to guide decision making regarding treatment of depression, a review of depression treatment recommendations in the adolescent population was conducted as well. The Guidelines for Adolescent Depression in Primary Care (GLAD-PC) published in 2018 was identified as useful tool in guiding treatment decisions in the primary care setting.
Designing and Plotting the Practice Change	Baseline data will be collected to determine the rate of detection of screening for adolescent depression using the PHQ-A 6 months prior to routine implementation of the screening tool. After committee and site approval, implementation of the PHQ-A will take place for 6 months from June, 2020- December, 2020.
Integrating and Sustaining the Practice Change and Disseminating Results	Evaluation of the project objectives will be completed through evaluation of data and provider survey. Data will be evaluated following the implementation period to determine if at least 75% of adolescents were screened for depression using the PHQ-A during the implementation period. A survey will be administered to providers to assess their level of confidence using the screening tool and utilizing the GLAD-PC.

CHAPTER THREE: PROJECT DESIGN AND IMPLEMENTATION

Project Design

The purpose of this practice improvement project was to increase the rates of adolescent depression screening, detection, and intervention by rural primary care providers. The project was guided by the following objectives:

1. In six months, following the implementation of the PHQ-A, the number of adolescents (aged 12-18) completing routine screening for depression will increase to 75% or greater.
2. Primary care providers in a rural primary care clinic will report an increase in confidence screening for depression in 12-18 year-old patients.
3. Primary care providers in a rural primary care clinic will report an increase in confidence using the GLAD-PC recommendations for adolescent depression management.

Methods

A thorough literature review was completed supporting the implementation of routine depression screening in the adolescent population. A need was identified for increased detection of depression in the adolescent population, especially in the primary care setting (Zuckerbrot et al., 2018). Many adolescents visit a primary care provider but do not readily disclose symptoms of depression upon interview. Literature suggests that screening tools have been effective at detecting depression in the adolescent population (Dever, 2016). Detecting adolescent depression was recognized as being crucial in order to provide early intervention and prevent further symptoms and comorbidities. The focus of this project was to increase the rates of screening and intervention of adolescent depression in the rural primary care setting. The project design involved routine implementation of the Patient Health Questionnaire-A (PHQ-A) depression screening tool and Guidelines for Adolescent Depression in Primary Care (GLAD-PC) by rural

primary care providers. The PHQ-A was selected for use as it demonstrates significant sensitivity (0.73) and specificity (0.94) in the adolescent population (Clinton & Kaszuba, 2015).

The primary care provider may be the only healthcare provider that an adolescent comes in contact with, especially in rural areas where access to care is often limited. Up to 50% of adolescents with depression are not diagnosed in the primary care setting (Gledhill & Hodes, 2016). As previously discussed, adolescent suicide rates have risen in North Dakota, including rural areas. Routine depression screening in the adolescent population provides an opportunity for identification and provider intervention before symptoms escalate. For this reason, the rural primary care clinic was identified as an ideal setting for implementation of the project.

Setting

The project took place at the Washburn and Underwood primary care clinics. The Washburn and Underwood primary care clinics are independently owned and serve residents of all ages in McLean County, North Dakota. Primary care services are provided by four family nurse practitioners, who work cooperatively to share hours between the two clinics. Registered nurses and support staff also aid in providing health and wellness care for children, teens, adults, and seniors. In 2019, 1487 total patients were seen between the two clinics with 159 being adolescents ages 12 to 18. Inclusion criteria for participation in the project included being a primary care provider at the Washburn and Underwood Clinics. Exclusion criteria included unwillingness to participate in the project as participation is voluntary. Sample size was predicted to be four Nurse Practitioners.

Prior to implementation of the screening tool, a meeting was held with primary care clinic staff and a letter of support was obtained (Appendix G). During the meeting, education was offered to clinic providers on the topic of adolescent depression including evidence-based

recommendations for the identification and treatment of adolescent depression in the primary care setting as described in the GLAD-PC. The providers were introduced to reference materials from the GLAD-PC including the “Clinical Assessment Flowchart” (Appendix D) and “Clinical Management Flowchart” (Appendix E). The implementation process was also discussed in detail with all clinic staff involved in implementation. Following the meeting, clinic providers and staff verbalized understanding of the implementation process including use of the PHQ-A and GLAD-PC.

All adolescent patients between the ages of 12 and 18, visiting the Washburn and Underwood, ND clinics, were given a paper copy of the PHQ-A screening tool by nursing staff when shown to room at the beginning of their visit. The patient was then given up to 5 minutes to complete the screening tool independently. The completed paper copy of the PHQ-A was then given to the primary care provider who evaluated the results. If appropriate, the provider further assessed for depressive symptoms and provided appropriate interventions per the GLAD-PC. Following each visit, the provider documented completion of screening using the PHQ-A as well as any interventions completed in the electronic health record (EHR). Clinic provider knowledge and confidence in screening for depression in the adolescent population were evaluated following the implementation period using a survey as described in further detail below.

Evaluation

Three objectives were developed to guide the project as previously discussed. Objectives included increasing rates of screening for adolescent depression using the PHQ-A, reported increase in provider confidence in screening for adolescent depression, and increase in provider confidence utilizing the GLAD-PC guidelines following the study.

The first objective involving increased rates of screening for adolescent depression was evaluated by provider survey and chart review. In order to establish comparative data, a review of the electronic health record was completed evaluating rates of screening for adolescent depression using a screening tool in the 6 months prior to project implementation. The chart review revealed that 87 patients age 12-18 were seen by a primary care provider at the Washburn and Underwood clinics in the 6 months preceding the project (01/01/2019-06/01/2020). According to the electronic health record, none of the 12-18-year-old patients were screened for depression using a self-administered screening tool during that time. In order to evaluate if screening rates using the PHQ-A increased to 75% or more following the 6-month implementation period, a chart review was once again performed.

The second and third objectives were evaluated similarly using a survey assessing provider self- perceived confidence in screening for adolescent depression and utilizing the GLAD-PC recommendations. Providers at the Washburn and Underwood clinics were given a survey following the project that contained multiple questions about the practice improvement project (Appendix C). The first question investigated the second project objective, assessing for increase in confidence screening for adolescent depression. The second question investigated the third project objective, assessing for increase in confidence utilizing the GLAD-PC recommendations. Three additional questions were also listed on the post-project provider survey to help assess sustainability of the project interventions. Questions evaluated likelihood of continued implementation of routine screening for adolescent depression using the PHQ-A, anticipated utilization of the GLAD-PC following the project, and barriers to routine screening encountered during the implementation period. Results of these questions also helped to identify opportunities for further research.

Data Collection

Study related data were generated in the following manner. At clinic visits in Washburn and Underwood, ND, adolescent patients were administered the PHQ-A depression screening tool. Completion of the PHQ-A screening as well as any interventions completed were documented in the providers note in the electronic health record (EHR). Completion of screening using the PHQ-A was also indicated using diagnosis code Z13. 31, “Encounter for screening for depression”. The period of data collection occurred following the 6-month implementation period of the PHQ-A screening tool and GLAD-PC guidelines. All data were stored in the EHR for review by the co-investigator to determine completion rate. Using the EHR, the co-investigator reviewed the number of patients age 12-18, seen in the Washburn and Underwood clinics during the 6-month implementation period that were screened using the PHQ-A compared with the total number of patients age 12-18 seen during that time in order to determine the percentage of adolescents age 12-18 screened for depression using the PHQ-A.

Protection of Human Subjects

This practice improvement project was considered exempt by the North Dakota State University Institutional Review Board (IRB) on June 17, 2020 (Appendix I).

CHAPTER FOUR: RESULTS

Following the 6-month implementation period, the project was evaluated to determine whether objectives were achieved. The implementation period began on June 22, 2020 and ended on December 18, 2020. Throughout the 6-month period, the PHQ-A screening tool and GLAD-PC were utilized by Washburn and Underwood clinic providers. The end of the implementation period, participating providers were asked to complete a brief survey to further assess their experience. Once the implementation period ended, data were collected and analysis began. Quantitative data was analyzed to determine results of the project. Four providers at the Washburn and Underwood clinics participated in the project and completed the post-study evaluation survey. All providers were female nurse practitioners working in the rural setting.

Presentation of Findings

As a reminder, the objectives of the project include:

1. In six months, following the implementation of the PHQ-A, the number of adolescents (aged 12-18) completing routine screening for depression will increase to 75% or greater.
2. Primary care providers in a rural primary care clinic will report an increase in confidence screening for depression in 12-18-year-old patients.
3. Primary care providers in a rural primary care clinic will report an increase in confidence using the GLAD-PC recommendations for adolescent depression management.

A link to the post-implementation survey, created using Qualtrics software, was sent out to each provider who participated in the project. The purpose of the survey was to evaluate results of implementation of the PHQ-A and GLAD-PC. All of the providers participating in the project completed the survey. The post-implementation survey consisted of five questions (Appendix C). Questions one and two consisted of a yes or no response, questions three and four

consisted of a seven-point Likert scale response and question 5 consisted of a yes or no response with the option to further describe the selected answer with free text. Data were collected and analyzed from hard copies of the screening tools administered as well as patient lists provided by the clinic. In total, 50 hard copies of completed screening tools were collected as well as a list revealing 57 office visits with patients aged 12-18 that occurred during the implementation period. The following sections include results in relation to the objective addressed.

Objective One

Objective one, to increase the number of adolescents completing routine screening for depression to 75% or greater following the implementation of the PHQ-A, was evaluated by comparing the rate of screening adolescents (aged 12-18) for depression using the PHQ-A in the 6 months prior to project implementation with the rate of screening adolescents for depression using the PHQ-A during the 6-month implementation period. Rates of screening were calculated by taking the number of adolescents completing the PHQ-A screening tool divided by the total number of adolescents seen at office visits during the specified time frame. A total of 87 patients aged 12 to 18 were seen at an office visit by a primary care provider in the 6 months preceding the project, none of which were screened for depression using a self-administered screening tool during that time. During the implementation period, 53 patients were seen at an office visit by a primary care provider, 50 of which were screened for depression using the PHQ-A screening tool. Data analysis revealed that rates of screening for depression in adolescents aged 12-18 increased from 0% in the 6 months preceding the implementation period to 94% during the implementation period. In addition to analysis of screening rates, presence of barriers to routinely implementing screening using the PHQ-A were assessed in the post-implementation survey. Four (100%) providers answered “no” to the questions “In the past 6 months, did you

encounter any barriers to routinely implementing the PHQ-A screening tool in adolescents aged 12-18 years?”. See Table 8 for an illustration of post-implementation survey findings.

Objective Two

Objective two, to evaluate for an increase in rural primary care provider confidence in screening for depression in 12-18-year-old patients, was evaluated through the use of a yes or no question on the post-implementation provider survey. Additionally, likelihood of continued use of the PHQ-A was evaluated through use of the seven-point Likert scale on the post-implementation survey. The statements provided on the survey to evaluate the second objective included:

1. In the past 6 months, has your confidence in screening for adolescent depression increased?
2. How likely are you to continue routinely screening adolescents aged 12-18 years for depression using the PHQ-A?

Four providers stated “yes”, that their confidence in screening for adolescent depression increased in the past 6 months. Four (100%) of the providers stated that they are “extremely likely” to continue routinely screening adolescents aged 12-18 years for depression using the PHQ-A. See Table 8 for an illustration of post-implementation survey findings.

Objective Three

Objective three, to evaluate for an increase in rural primary care provider confidence using the GLAD-PC recommendations for adolescent depression management, was evaluated through the use of a yes or no question on the post-implementation provider survey.

Additionally, likelihood of continued use of the GLAD-PC recommendations was evaluated

through use of the seven-point Likert scale on the post-implementation survey. The statements provided on the survey to evaluate the second objective included:

1. In the past 6 months, has your confidence in utilizing the GLAD-PC recommendations increased?
2. How likely are you to continue utilizing the GLAD-PC recommendations in the future?

Four providers stated “yes”, that their confidence in utilizing the GLAD-PC has increased in the past 6 months. Three (75%) of the providers stated that they are “extremely likely” and one (25%) of the providers stated that they are “moderately likely” to continue utilizing the GLAD-PC recommendations in the future. See Table 8 for an illustration of post-implementation survey findings.

Table 8

Post-implementation survey results

Question	Answer						
	Yes	No					
In the past six months, has your confidence in screening for adolescent depression increased?	4 (100%)	0					
In the past 6 months, has your confidence in utilizing the GLAD-PC recommendations increased?	4 (100%)	0					
	Extremely likely	Moderately likely	Slightly likely	Neither likely nor unlikely	Slightly unlikely	Moderately unlikely	Extremely unlikely
How likely are you to continue routinely screening adolescents aged 12-18 years for depression using the PHQ-A?	4 (100%)	0	0	0	0	0	0
How likely are you to continue utilizing the GLAD-PC recommendations in the future?	3 (75%)	1 (25%)	0	0	0	0	0
	Yes, please describe	No					
In the past 6 months, did you encounter any barriers to routinely implementing the PHQ-A screening tool in adolescents aged 12-18 years?	0	4 (100%)					

CHAPTER FIVE: DISCUSSION AND RECOMMENDATIONS

Interpretation of Results

The purpose of the project was to increase the rates of adolescent depression screening, detection, and intervention by rural primary care providers. The project included a co-investigator led educational session in which the PHQ-A screening tool and the GLAD-PC recommendations were introduced. Screening tool and guideline implementation occurred over the following six months. All of the project objectives were achieved. Results of the project indicate an increased rate of screening for adolescent depression in the rural primary care clinic as well as increased provider confidence using the screening tool and guidelines. Results of the project also indicate that participating rural primary care providers plan to use the screening tool and guidelines in future practice. Below, the results of each objective are discussed and interpreted.

Objective One

Objective one was that in six months following the implementation of the PHQ-A, the number of adolescents (aged 12-18) completing routine screening for depression would increase to 75% or greater. The objective was evaluated by comparing the rate of screening adolescents (aged 12-18) for depression using the PHQ-A in the 6 months prior to project implementation with the rate of screening adolescents for depression using the PHQ-A during the 6-month implementation period. Data analysis revealed that rates of screening for depression in adolescents aged 12-18 increased from 0% in the 6 months preceding the implementation period to 94% during the implementation period. Since the rate of screening increased to greater than 75%, a conclusion can reasonably be made that objective one was met.

In addition to analysis of screening rates, presence of barriers to routinely implementing screening using the PHQ-A were assessed in the post-implementation survey. Four (100%) providers answered “no” to the questions “In the past 6 months, did you encounter any barriers to routinely implementing the PHQ-A screening tool in adolescents aged 12-18 years?”. The absence of reported barriers to routine screening tool implementation likely promoted increased rates of screening.

Objective Two

Objective two was that primary care providers in a rural primary care clinic would report an increase in confidence screening for depression in 12-18-year-old patients. Objective two was evaluated through the use of a yes or no question on the post-implementation provider survey. Four providers (100%) answered “yes”, to the question “In the past 6 months, has your confidence in screening for adolescent depression increased?”. From the results of the post-implementation provider survey, a conclusion can reasonably be made that providers have reported an increase in confidence screening for depression in 12-18-year-old patients and therefore objective two was met.

In addition to assessing provider confidence screening for depression, likelihood of continued use of the PHQ-A screening tool was evaluated through use of the seven-point Likert scale on the post-implementation survey. Four (100%) of the providers stated that they are “extremely likely” to continue routinely screening adolescents aged 12-18 years for depression using the PHQ-A. A conclusion can be reasonably made that participating rural primary care providers will continue to routinely screen adolescent patients for depression using the PHQ-A screening tool.

Objective Three

Objective three was that primary care providers in a rural primary care clinic would report an increase in confidence using the GLAD-PC recommendations for adolescent depression management. Objective three was evaluated through the use of a yes or no question on the post-implementation provider survey. Four providers (100%) answered “yes”, to the question “In the past 6 months, has your confidence in utilizing the GLAD-PC guidelines increased?”. From the results of the post-implementation provider survey, a conclusion can reasonably be made that providers have reported an increase in confidence utilizing the GLAD-PC guidelines and therefore objective two was met.

In addition to assessing provider confidence utilizing the GLAD-PC guidelines, likelihood of continued use of the guidelines was evaluated through use of the seven-point Likert scale on the post-implementation survey. Three (75%) of the providers stated that they are “extremely likely” to continue utilizing the GLAD-PC guidelines in the future while one (25%) provider reported being “moderately likely” to continue utilizing the guidelines in the future. A conclusion can be reasonably made that participating rural primary care providers will continue to utilize the GLAD-PC guidelines and resources such as the Clinical Assessment Flowchart (Appendix D) and Clinical Management Flowchart (Appendix E) in the future.

Evaluation of Theoretical Framework

As discussed in chapter two, Roger’s Diffusion of Innovation Theory and The Iowa Model of Evidence-Based Practice were used to help design and facilitate the project. Both the theory and model proved helpful in successful project implementation. Favorable results of the project can be attributed to suitability of the chosen theory and model.

Roger's Diffusion of Innovation Theory was utilized to understand the uptake and influences of screening and managing adolescent depression. The five phases of the decision process: knowledge, persuasion, decision, implementation, and confirmation were useful in guiding the progression of change interventions. Primary care providers at the rural clinic were provided education about the topic of adolescent depression including the needs for screening and intervention. Following the educational session, providers expressed support for the proposed interventions. All providers participated in the implementation of the change interventions. Following the implementation period, a conclusion was made that the innovation was successful as providers reported increased confidence using the PHQ-A and GLAD-PC. Providers also reported moderate to extreme likelihood of continued use of the PHQ-A and GLAD-PC, confirming acceptance of the change interventions.

The Iowa Model of Evidence-Based Practice pathway served as a guide for planning and implementing the project. Decision points and feedback loops within the model were helpful in steering decisions made throughout the project. Ultimately, the project was successful in integrating practice change as evidence by the increased rate of depression screening in adolescent patients as well as increased provider confidence screening for depression and utilizing the GLAD-PC guidelines. Although the project did not allow for monitoring of key indicators through quality improvement following the implementation period, the practice change is likely to be sustained as providers reported notable likelihood of continued use of the change interventions.

The Logic Model (Appendix H) was created to concisely illustrate the resources and actions necessary to produce the desired results. The inputs and outputs of the project remained accurate throughout the project. Short term outcomes of the project were reached as described

through evaluation of project objectives. Although long term outcomes of the project will not be assessed prior to dissemination, they are likely to be met as evidence by plausibility of continued use of the PHQ-A and GLAD-PC.

Limitations

Throughout the course of the project, multiple limitations were identified. The first limitation involved the ongoing COVID-19 pandemic. The pandemic potentially affected the project in multiple ways. First, the participating providers were noted to have significantly less office visits with adolescent patients during the implementation period when compared with the 6 months preceding project implementation. A total of 87 adolescents between the ages of 12-18 were seen in the clinic from January 2020 to June 2020. Only 53 adolescents of the specified age range were seen from June 2020 to December 2020. Additionally, providers integrated use of telehealth visits into their practice throughout the implementation period due to the pandemic. Since screening tool use was focused on office visits and an electronic copy of the tool was not readily available in the electronic health record, providers did not utilize the screening tool when completing telehealth visits.

Another limitation noted was the inability to embed the PHQ-A and GLAD-PC into the electronic health record (EHR) in a time frame conducive to the project. Throughout the project, providers administered paper copies of the screening tool to adolescent patients. Once completed, providers computed total scores of the PHQ-A on the paper copy and evaluated results using the printed copy of the GLAD-PC to determine treatment interventions. When completed, paper copies of the PHQ-A were then scanned into the media tab of the EHR. Although the screening tool should continue to be administered via paper copy to allow for the patient to complete independently, it would be reasonable for the provider to enter results and

calculate PHQ-A total scores in the electronic health record. Having the screening tool and guidelines embedded in the EHR may increase accessibility and ease of use. Embedding the PHQ-A and GLAD-PC into the EHR would streamline use and eliminate human error as the computer would be able to calculate total scores on the PHQ-A and automatically apply them to the recommendations in the GLAD-PC. Additionally, this would save providers time as they would not have to manually calculate scores and apply them to GLAD-PC interventions. Providers would also have results of previously completed to trend screenings more readily for reference in future visits.

In addition, the project was completed at only one healthcare system in one rural area. Although results of the project are representative of the participating healthcare system, they may not be representative of other healthcare systems in other geographical locations. The number of providers participating in the project was also a limitation. Although all four providers at the healthcare system participated in the project, the sample size does not allow for findings to be assumed as representative of rural primary care providers in North Dakota as a whole.

Lastly, use of the PHQ-A and GLAD-PC was not tracked after the implementation period to determine the impact of the project with the providers at the Washburn/Underwood clinics. The timeline of the project did not allow for the co-investigator to directly evaluate continued use of the screening tool and guidelines. In addition, doing so would not have contributed to meeting project outcomes. Although continued use was not directly evaluated, post-implementation provider survey results suggest plans to sustain use in future practice. For this reason, future provider adherence can be anticipated.

Recommendations

Findings from the project support a need for primary care providers to utilize a tool such as the PHQ-A and GLAD-PC in order to improve confidence detecting and managing youth depression. For the participating clinics in Washburn and Underwood, continued use of the PHQ-A and GLAD-PC for the routine screening and management of adolescent depression are recommended.

In order to detect adolescent depression, the PHQ-A should be completed at each visit regardless of chief complaint. The GLAD-PC serves as a guide for managing adolescent depression once it has been detected. With sustained use of the PHQ-A and GLAD-PC, rural primary care providers should improve their practice by ensuring that adolescent depression is detected and properly managed. Early detection and management of adolescent depression has the potential to reduce the burden of disease.

In the future, it would be beneficial to ensure that the PHQ-A and GLAD-PC are embedded in the EHR. Having the screening tool and guidelines embedded into the EHR would improve accuracy of results by eliminating human error when calculating screening tool scores and save providers time by streamlining application of scores to guidelines to identify interventions. In addition, providers would have results of previously completed screenings more readily available to reference during future visits.

On a larger scale, an opportunity exists for increased rural primary care provider education on the topic of youth depression. It would be ideal to develop a brief educational module that could be completed at the providers convenience. The educational module would bring awareness to the prevalence of adolescent depression, the need for routine screening using a self-administered tool such as the PHQ-A, and the availability of tools to guide intervention

such as the GLAD-PC. The educational module would allow for sharing of information with rural providers across the state, promoting widespread practice change.

Implications for Practice

Since significant shortages of mental health providers exist, especially in rural areas, it is crucial that primary care settings are equipped to address adolescent depression. Primary care providers must be confident detecting and managing depression in the adolescent population. Use of the PHQ-A screening tool and GLAD-PC recommendations allow for increased rural primary care provider confidence detecting and managing adolescent depression. For this reason, providers should routinely use the PHQ-A and GLAD-PC in adolescents aged 12-18.

New Findings

New studies reinforce the importance of provider education to facilitate the integration of adolescent depression screening and behavioral health services in primary care. One study, similar to the dissertation project, sought to improve screening, diagnosis, and treatment of depression by implementing a standardized questionnaire (Mansour, Krishnaprasadh, Lichtenberger, & Teitelbaum, 2020). The PHQ-A screening tool was selected for implementation at a Federally Qualified Health Center in New Jersey. For the six-month implementation period, adolescent patients aged 12 to 17 years old presenting for well child visits were screened using the PHQ-A. Prior to the implementation period, no systematic screening tool was being used to screen adolescents for depression. Following the implementation period, the screening rate increased to 70%. Challenges to screening were documented and included inability to integrate the PHQ-A into the EHR and difficulty arranging follow-up mental health services. Overall, the study concluded that using a standardized and validated tool to screen for depression helped

providers to detect and monitor adolescent depression. Outcomes of the study further support the results and impact of the dissertation project.

Another study sought to examine the long-term impact of primary care provider training with standardized patients on screening and diagnosis of adolescent depression in primary care (Fallucco, James, Smotherman, & Greco, 2019). Experiential training consisted of a 60-minute educational seminar followed by a 60-minute session in which primary care providers practiced clinical skills with standardized patients. Throughout the training, the PHQ-A screening tool, suicide risk assessment, treatment of depression with antidepressant medication, and long-term management were reviewed with 25 participating providers. During the 12-month period after the training, adolescent depression screening rates increased significantly from 51% to 80% and the percentage of adolescents newly diagnosed with depression increased from .89% to 2.22%. The study concluded that primary care providers who participated in the experiential training using standardized patients were more likely to screen for, detect, and diagnose adolescent depression. Much like the dissertation project, the study involved the implementation of interventions promoting detection and management of adolescent depression. Results were similar to those of the dissertation project. Adolescent depression screening rates increased with provider education and introduction of the PHQ-A.

The Healthy People national objectives are developed every ten years and strive to improve the health and well-being of Americans. Although final results of the Healthy People 2020 objectives discussed in chapter one remain unpublished, preliminary results suggest inadequate progress. In addition, the new 10-year objectives for Healthy People 2030 have been developed and include objectives similar to those of Healthy People 2020, reflecting a need for further improvement. Healthy People 2030 objectives pertinent to the topic of adolescent

depression include goals to reduce suicide attempts by adolescents, to increase the proportion of primary care physician office visits where adolescents and adults are screened for depression, and to increase the proportion of adolescents with depression who get treatment. The objectives are further described in tables 9-11.

Table 9

MHMD-02: Reduce suicide attempts by adolescents

Baseline:	2.4 suicides per 100 population or students in grades 9 through 12 occurred in the past 12 months, as reported in 2017
Target:	1.8 suicides per 100 population

Table 10

MHMD-08: Increase the proportion of primary care physician office visits where adolescents and adults are screened for depression

Baseline:	8.5 percent of primary care office visits included screening for depression in persons aged 12 years and over in 2016
Target:	13.5 percent

Table 11

MHMD-06: Increase the proportion of adolescents with depression who get treatment

Baseline:	41.4 percent of adolescents aged 12 to 17 years with MDEs received treatment in the past 12 months, as reported in 2018
Target:	46.4 percent

U.S. Department of Health and Human services (2020)

Although recent studies pertaining to the occurrence of depression in adolescents in relation to the COVID-19 pandemic are not yet available, information gathered in the adult population indicates cause for concern. A recent study published by the American Medical Association investigated the prevalence of depression symptoms in United States adults before and during the COVID-19 pandemic (Ettman et al., 2020). Using a survey, the study found that depression symptoms in the US increased more than threefold, from 8.5% before COVID-19 to

27.8% during the COVID-19 pandemic. In addition, prior studies have indicated that depression increases following traumatic events suggesting that depression rates may continue to rise following the pandemic (Goldman & Galea, 2014). One may predict that the rates of depression in adolescents have risen throughout the COVID-19 pandemic, similar to those of the adult population. The potential for increasing rates of depression further supports the need for routine screening and management of adolescent depression in the primary care setting.

Dissemination

Dissemination increases awareness of research which maximizes the impact that results can have on improving health outcomes. Communicating results of research allows audiences to make more informed decisions that may lead to higher quality of care (Melnyk & Fineout-Overholt, 2015). Multiple different methods of disseminating evidence exist including oral presentations, poster presentations, professional committees, journals, and community meetings. The project plan was first presented in September of 2020 at the North Dakota Nurse Practitioner Association (NDNPA) Pharmacology Conference. The project results will be presented at the NDSU College of Health Professions Poster Presentation in the spring of 2021. The co-investigator also plans to submit the project for publication to a suitable journal in the summer/fall of 2021. Journals of interest include those that are focused on the topics of adolescent health, primary care, and rural health such as *The Journal of Rural Health* and *The Journal of Family and Community Health*.

Implications for Future Research

Adolescent depression is a widely researched topic in healthcare and evidence indicating the heavy burden of disease is abundant. Further research for the project, screening for adolescent depression in a rural primary care clinic, may include a number of modifications.

Firstly, increasing the number of clinics and providers participating in the project would increase the amount of screening data and provider feedback and further validate the outcomes of the project. Additionally, measurement of rates of provider use of the PHQ-A and GLAD-PC following the implementation period would provide further information regarding lasting effects of the project. Lastly, development and evaluation of an educational program designed to increase rural primary care provider knowledge and confidence detecting and managing adolescent depression at a statewide level would allow for further evaluation of project objectives and promote widespread practice change.

Although the focus of the project was to increase identification and management of adolescent depression in the rural primary care setting, a need still exists to increase access to specialty provider services. Primary care providers can effectively manage many cases of adolescent depression however, as mentioned in the GLAD-PC some cases require referral to a mental health specialist. Access to mental health specialists remains limited in rural healthcare settings. Further research investigating the barriers to accessing specialty behavioral health services, specifically in rural North Dakota, should be completed. Once major barriers have been identified, plans should be developed to assist in improving mental healthcare in rural North Dakota.

Application to Nurse Practitioner Role

More than 69% of nurse practitioners deliver primary care services, many of which are in rural areas (American Association of Nurse Practitioners, 2018). Nationally, nurse practitioners represent one in four providers in rural practices. Along with managing existing health issues, Nurse Practitioners focus on health promotion and disease prevention. Implementation is

imperative for rural nurse practitioners to follow recommendations for preventative services including those established by the USPSTF in order to promote positive health outcomes.

Since access to specialty services is often limited, rural primary care providers play an important role in detecting and managing youth depression. The USPSTF recommends screening adolescents aged 12-18 years for depression to prevent future morbidity and mortality. The PHQ-A screening tool provides an opportunity for detection of adolescent depression, while the GLAD-PC may guide provider interventions based on results of the screening tool. As previously discussed, consequences of adolescent depression may include functional impairments in performance at school or work, recurrent episodes of depression in adulthood, and increased risk for suicidal ideation, suicide attempts, and suicide completion. With many nurse practitioners providing primary care services in rural areas, there is no doubt that many will encounter adolescents with depression. Not only can Nurse Practitioners complete depression assessment and management interventions during office visits, but also via telehealth. Utilization of telehealth technology by Nurse Practitioners, especially in rural areas, can further increase overall access to mental health services. If nurse practitioners in the rural primary care setting are able to confidently detect and manage adolescent depression using the PHQ-A and GLAD-PC, they are likely to reduce the burden of disease.

REFERENCES

- American Association of Nurse Practitioners. (2018). Retrieved from <https://www.aanp.org/>
- American Academy of Pediatrics. (2018). *Adolescent Depression*. <https://www.aap.org/en-us/aap-voices/Pages/Adolescent-Depression.aspx>
- American Psychiatric Association (2015). *Major Depressive Disorder*.
<http://www.dsm5.org/Pages/Default.aspx>
- Barrow, J. M., & Toney-Butler, T. J. (2018). *Change management*.
<https://www.ncbi.nlm.nih.gov/books/NBK459380/>.
- Brent A. (2016). Penalty for delay of game? Sobering results in treating adolescent depression. *Journal of Adolescent Health, 58*(3), 249-250.
<https://doi.org/10.1016/j.jadohealth.2015.12.004>
- Bodden, D.H., Stikkelbroek, Y., & Dirksen, C. (2018). Societal burden of adolescent depression, an overview and cost-of-illness study. *Journal of Affective Disorders, 241*, 256-262.
<https://doi.org/10.1016/j.jad.2018.06.015>
- Boyd C., Lewis, J., Borreggine, K., & Benton, T. D. (2018). Adolescent depression: Identification and treatment. *Current Treatment Options in Pediatrics, 4*(3), 350-362.
<https://doi.org/10.1007/s40746-018-0135-y>
- Clinton, & Kaszuba. (2015). *Comparing and contrasting depression screening instruments for use among adolescents in primary care*. <https://scholarlyworks.lvhn.org/research-scholars-posters/417/>
- Depression Basics. (2016). <https://www.nimh.nih.gov/health/publications/depression/index.shtml>
- Dever, M. (2016). Screening for depression in adolescents with diabetes. *Journal of Pediatric Nursing, 31*(1), 117-119. <https://doi.org/10.1016/j.pedn.2015.11.004>

- Dunn, E. C., Brown, R. C., Dai, Y., Rosand, J., Nugent, N. R., Amstadter, A. B., & Smoller, J. W. (2015). Genetic determinants of depression: Recent findings and future directions. *Harvard Review of Psychiatry, 23*(1), 1–18.
<https://doi.org/10.1097/HRP.0000000000000054>
- Ettman, C., Abdalla, S., Cohen, G., Sampson, L., Vivier, P., & Galea, S. (2020, September 02). *Prevalence of depression symptoms in US adults before and during the COVID-19 pandemic*. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2770146>
- Fallucco, E., James, L., Smotherman, C., & Greco, P. (2019). Impact of experiential training with standardized patients on screening and diagnosis of adolescent depression in primary care. *Journal of Adolescent Health, 65*(1), 57-62.
<https://doi.org/10.1016/j.jadohealth.2018.12.022>
- Forman-Hoffman L., & Viswanathan, M. (2018). Screening for depression in pediatric primary care. *Current Psychiatry Reports, 20*(8). <https://doi.org/10.1007/s11920-018-0926-7>
- Gledhill, J., & Hodes, M. (2015). Management of depression in children and adolescents. *Progress in Neurology and Psychiatry, 19*(2), 28-33.
<https://doi.org/10.1002/pnp.375>
- Goldmann, E., & Galea, S. (2014). *Mental Health Consequences of Disasters*.
<https://www.annualreviews.org/doi/full/10.1146/annurev-publhealth-032013-182435>
- Goldman-Mellor, Allen, K., & Kaplan, M. S. (2017). Rural-urban disparities in adolescent nonfatal suicidal ideation and suicide attempt: a population-based study. *Suicide and Life-Threatening Behavior, 48*(6), 709-719. <https://doi.org/10.1111/sltb.12390>

- Harder S., Barry, S. E., French, S., Consigli, A. B., & Frankowski, B. L. (2019). Improving adolescent depression screening in pediatric primary care. *Academic Pediatrics, 19*(8), 925-933. <https://doi.org/10.1016/j.acap.2019.02.014>
- Helbich, M., Blüml, V., Jong, T. D., Plener, P. L., Kwan, M., & Kapusta, N. D. (2017). Urban–rural inequalities in suicide mortality: A comparison of urbanicity indicators. *International Journal of Health Geographics, 16*(1). <https://doi.org/10.1186/s12942-017-0112-x>
- Hoffmann J., Farrell C., & Monuteaux M. (2020). *Pediatric suicide associated with county level poverty in the United States.*
https://www.practiceupdate.com/C/95813/56?elsca1=emc_eneews_topic-alert
- Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing, 14*(3), 175-182.
<https://doi.org/10.1111/wvn.12223>
- Jones, S., Walker, C., Miles, A., De Silva, E., & Zimitat, C. (2015). *A rural, community-based suicide awareness and intervention program.*
<https://pdfs.semanticscholar.org/c6c5/57dc03efcd5a5d1596cf86a981408f670348.pdf>
- Kaminski, J. (2011). Diffusion of Innovation Theory. *Canadian Journal of Nursing Informatics, 6*(2). <http://cjni.net/journal/?p=1444>
- Kassis, W., Artz, S., & White, J. (2017). Understanding depression in adolescents: A dynamic psychosocial web of risk and protective factors. *Child & Youth Care Forum, 46*(5), 721-743. <https://doi.org/10.1007/s10566-017-9404-3>
- Kelly N. (2019). *Screening tests in children and adolescents.*
<https://www.uptodate.com/contents/screening-tests-in-children-and-adolescents>

- Leslie R., & Chike-Harris, K. (2017). Patient-administered screening tool may improve detection and diagnosis of depression among adolescents. *Clinical Pediatrics*, 57(4), 457-460.
<https://doi.org/10.1177/0009922817730343>
- Mansour, M., Krishnaprasadh, D., Lichtenberger, J., & Teitelbaum, J. (2020). Implementing the Patient Health Questionnaire Modified for Adolescents to improve screening for depression among adolescents in a Federally Qualified Health Centre. *BMJ Open Quality*, 9(4). <https://doi.org/10.1136/bmjoq-2019-000751>
- Melnyk, B. M., & Fineout-Overholt, E. (2015). *Evidence-based practice in nursing & healthcare: A guide to best practice* (3rd ed.). Philadelphia, PA: Wolters Kluwer.
- Miloseva, L., Vukosavljevic-Gvozden, T., Milosev, V., & Davis, T. (2018). Can we predict and prevent subclinical depression in adolescents? *The Journal of Nervous and Mental Disease*, 206(2), 102-107. <https://doi.org/10.1097/nmd.0000000000000783>
- Mitchell, G. (2013). Selecting the best theory to implement planned change. *Nursing Management*, 20(1), 32-37. <https://doi.org/10.7748/nm2013.04.20.1.32.e1013>
- National Institute of Mental Health (2017). U.S. Department of Health and Human Services. *Major depression*. https://www.nimh.nih.gov/health/statistics/major-depression.shtml#part_155031
- National Institute of Mental Health (2019). U.S. Department of Health and Human Services. *Suicide*. <https://www.nimh.nih.gov/health/statistics/suicide.shtml>
- North Dakota Department of Public Instruction (2019). North Dakota State Government. *Youth Risk behavior survey*. <https://www.nd.gov/dpi/districtschools/safety-health/youth-risk-behavior-survey>

- Ranney, M. L., Freeman, J. R., Connell, G., Spirito, A., Boyer, E., Walton, M., Cunningham, R. M. (2016). A depression prevention intervention for adolescents in the emergency department. *Journal of Adolescent Health, 59*(4), 401-410.
<https://doi.org/10.1016/j.jadohealth.2016.04.008>
- Reardon, T., Harvey, K., Baranowska, M., O'Brien, D., Smith, L., & Creswell, C. (2017). What do parents perceive are the barriers and facilitators to accessing psychological treatment for mental health problems in children and adolescents? A systematic review of qualitative and quantitative studies. *European Child & Adolescent Psychiatry, 26*(6), 623-647. <https://doi.org/10.1007/s00787-016-0930-6>
- Roseman, M., Kloda, L. A., Saadat, N., Riehm, K. E., Ickowicz, A., Baltzer, F., . . . Thombs, B. D. (2016). Accuracy of depression screening tools to detect major depression in children and adolescents: A systematic review. *The Canadian Journal of Psychiatry, 61*(12), 746-757. <https://doi.org/10.1177/0706743716651833>
- Thummathai, K., Sethabouppha, H., Chanprasit, C., & Lasuka, D. (2018). Depression risk assessment tool for adolescents. *Archives of Psychiatric Nursing, 32*(3), 343-347.
<https://doi.org/10.1016/j.apnu.2017.11.023>
- University of North Dakota. (2019). *Fifth biennial report: health issues for the state of North Dakota* (Rep. No. 5). https://med.und.edu/publications/biennial-report/_files/docs/fifth-biennial-report-interactive.pdf
- U.S. Preventive Services Task Force. (2016). *Depression in Children and Adolescents: Screening*.
<https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/depression-in-children-an-adolescents-screening1>

U.S. Preventive Services Task Force. (2015). *Depression in Adults: Screening*.

<https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/depression-in-adults-screening>

U.S. Department of Health and Human Services (2017). Healthy People 2020. *Adolescent health objectives*.

<http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=2>

Zuckerbrot A., Cheung, A., Jensen, P. S., Stein, R. E., & Laraque, D. (2018). Guidelines for Adolescent Depression in Primary Care (GLAD-PC): Part I. Practice preparation, identification, assessment, and initial management. *Pediatrics*, *141*(3).

<https://doi.org/10.1542/peds.2017-4081>

APPENDIX A. PHQ-A

PHQ-9 modified for Adolescents (PHQ-A)

Name: _____ Clinician: _____ Date: _____

Instructions: How often have you been bothered by each of the following symptoms during the past **two weeks**? For each symptom put an "X" in the box beneath the answer that best describes how you have been feeling.

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

In the **past year** have you felt depressed or sad most days, even if you felt okay sometimes?
 Yes No

If you are experiencing any of the problems on this form, 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

Has there been a time in the **past month** when you have had serious thoughts about ending your life?
 Yes No

Have you **EVER**, in your WHOLE LIFE, tried to kill yourself or made a suicide attempt?
 Yes No

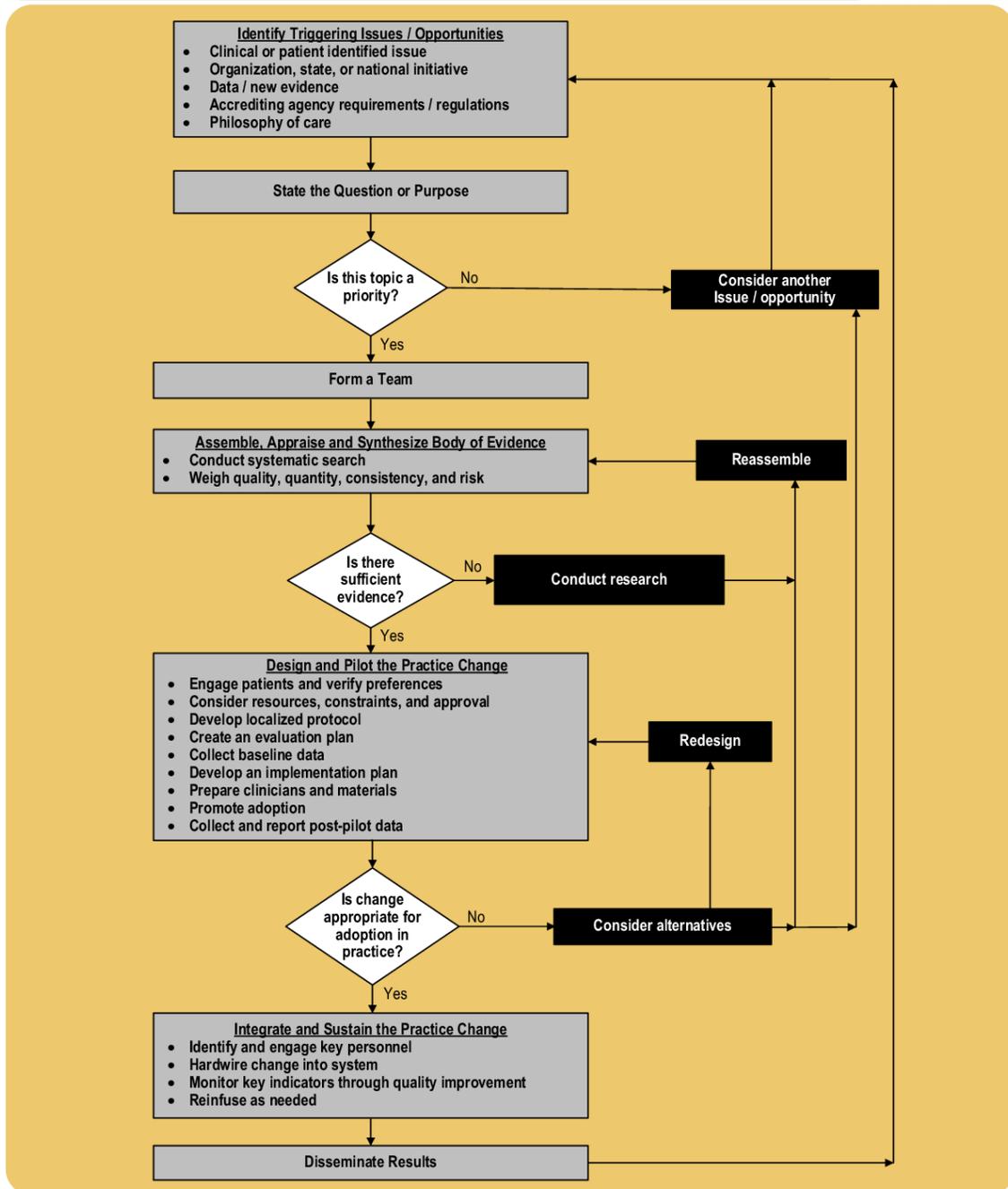
***If you have had thoughts that you would be better off dead or of hurting yourself in some way, please discuss this with your Health Care Clinician, go to a hospital emergency room or call 911.*

Office use only: Severity score: _____

(U.S. Preventative Service Task Force, 2015)

APPENDIX B. THE IOWA MODEL REVISED

The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care



◆ = a decision point

DO NOT REPRODUCE WITHOUT PERMISSION

©University of Iowa Hospitals and Clinics, Revised June 2015
To request permission to use or reproduce, go to
<http://www.uihealthcare.org/nursing-research-and-evidence-based-practice/>

(Iowa Model Collaborative, 2017)

APPENDIX C. POST-STUDY PROVIDER ASSESSMENT TOOL

In the past 6 months, has your confidence in screening for adolescent depression increased?

- yes
- no

In the past 6 months, has your confidence in utilizing the GLAD-PC recommendations increased?

- yes
- no

How likely are you to continue routinely screening adolescents aged 12-18 years for depression using the PHQ-A?

- Extremely likely
- Moderately likely
- Slightly likely
- Neither likely nor unlikely
- Slightly unlikely
- Moderately unlikely
- Extremely unlikely

How likely are you to continue utilizing the GLAD-PC recommendations in the future?

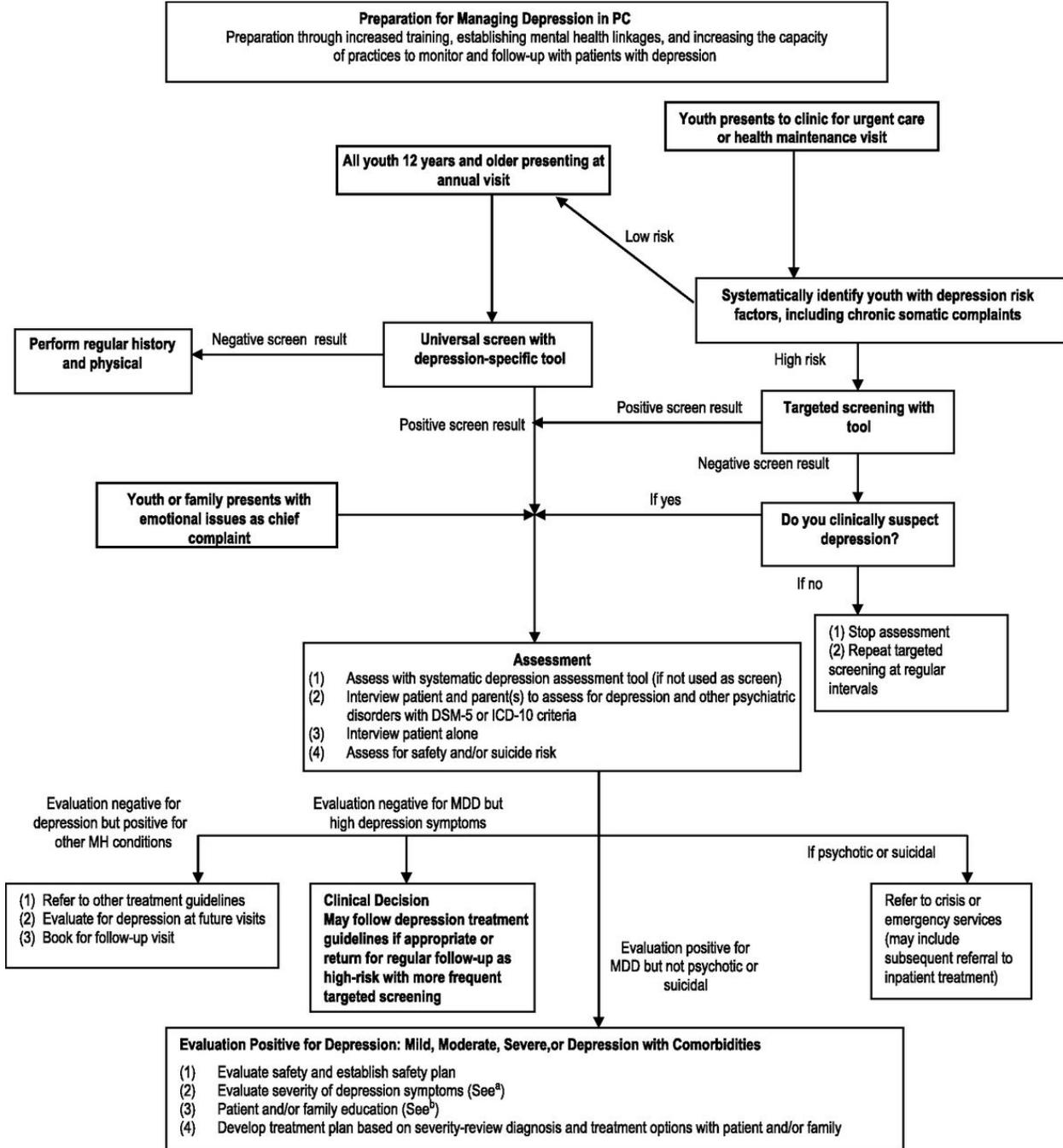
- Extremely likely
- Moderately likely
- Slightly likely
- Neither likely nor unlikely
- Slightly unlikely
- Moderately unlikely
- Extremely unlikely

In the past 6 months, did you encounter any barriers to routinely implementing the PHQ-A screening tool in adolescents aged 12-18 years?

yes, please describe

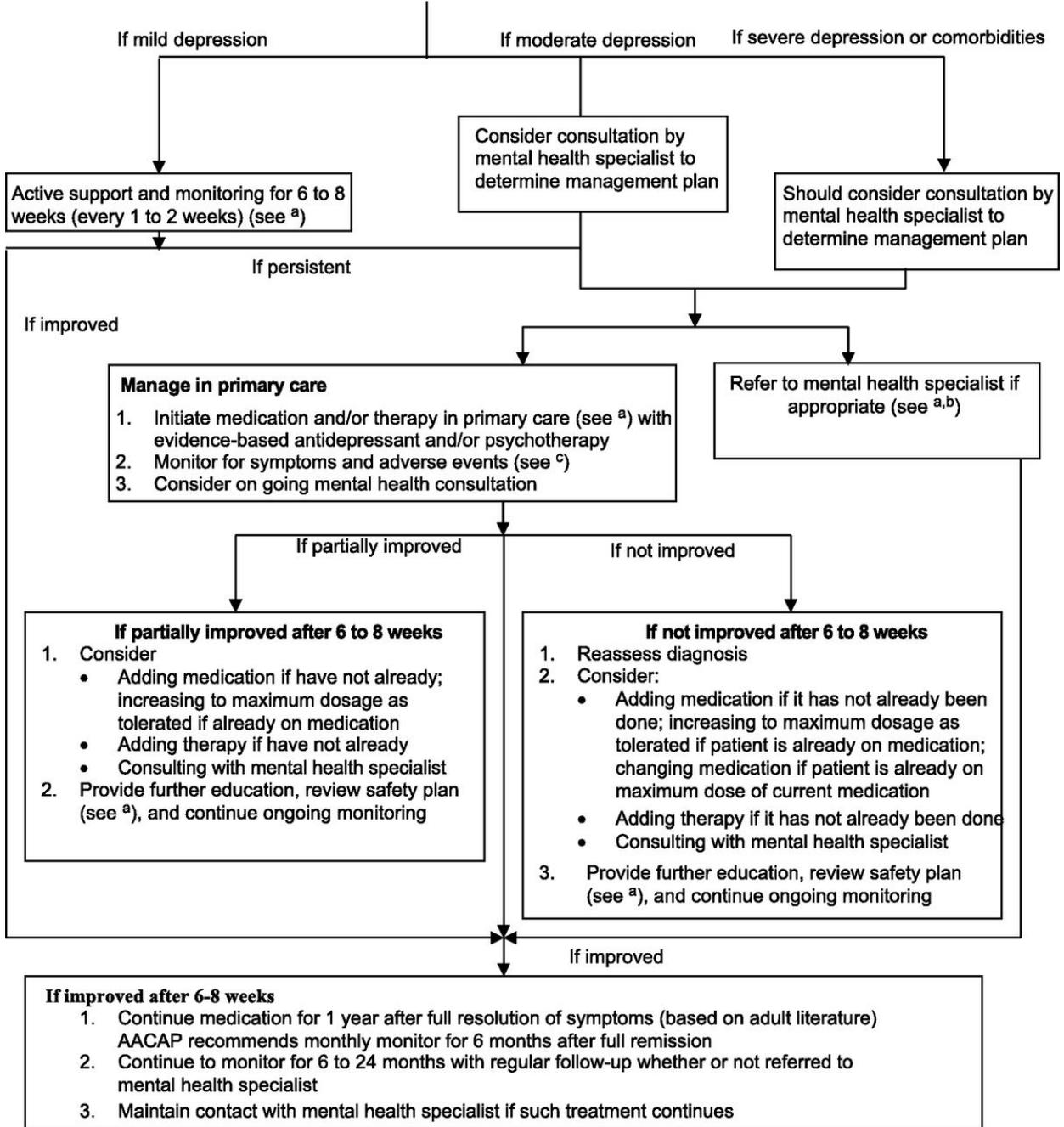
no

APPENDIX D. CLINICAL ASSESSMENT FLOWCHART



(American Academy of Pediatrics, 2018)

APPENDIX E. CLINICAL MANAGEMENT FLOWCHART



(American Academy of Pediatrics, 2018)

APPENDIX F. PERMISSION TO USE IOWA MODEL



Kimberly Jordan - University of Iowa Hospitals and Clinics

<noreply@qualtrics-survey.com>

Fri 11/22/2019 4:48 PM

Bailey, Hannah



You have permission, as requested today, to review and/or reproduce *The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care*. Click the link below to open.

[The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care](#)

Copyright is retained by University of Iowa Hospitals and Clinics. **Permission is not granted for placing on the internet.**

Citation: Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing*, 14(3), 175-182. doi:10.1111/wvn.12223

In written material, please add the following statement:

Used/reprinted with permission from the University of Iowa Hospitals and Clinics, copyright 2015. For permission to use or reproduce, please contact the University of Iowa Hospitals and Clinics at 319-384-9098.

Please contact UHCNursingResearchandEBP@uiowa.edu or 319-384-9098 with questions.

APPENDIX G. AGENCY LETTER OF SUPPORT



*Dedicated to you and your Family's Health.
Michele Leidholm, FNP
Kellie Weisenburger, FNP
Kerri Benning, FNP*

AGENCY LETTER OF SUPPORT

June 4, 2020

North Dakota State University

To whom it may concern:

The Washburn and Underwood clinics are writing to express support for the proposed project: Screening for Adolescent Depression in a Rural Primary Care Clinic. We are supportive of administration of the PHQ-A, subsequent review of the electronic health record for distribution of the PHQ-A, and use of the Guidelines for Adolescent Depression in Primary Care (GLAD-PC) over the 6-month time period beginning in June 2020.

If you have any questions, please contact the Washburn Clinic at 701-462-3389.

Sincerely,

A handwritten signature in black ink, appearing to read "Michele Leidholm".

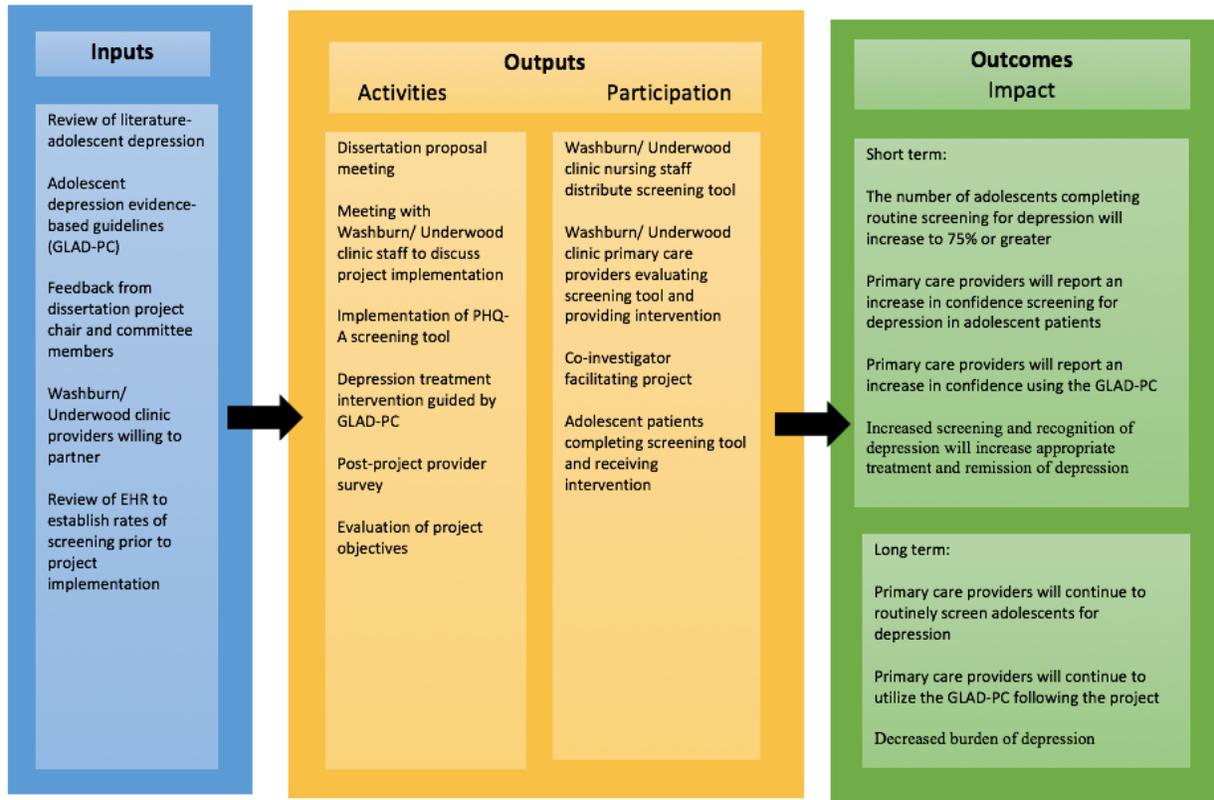
Michele Leidholm, FNP

Clinic Manager

Washburn and Underwood Clinics

Underwood-701-442-3148 | PO Box 253 | Underwood, ND 58578
Washburn-701-462-3389 | PO Box 248 | Washburn, ND 58577

APPENDIX H. LOGIC MODEL



APPENDIX I. IRB APPROVAL



June 17, 2020

Dr. Dean Gross
Nursing

Re: IRB Determination of Exempt Human Subjects Research:
Protocol #PH20281, "Screening for Adolescent Depression in a Rural Primary Care Clinic"

NDSU Co-investigator(s) and research team: Hannah Bailey

Date of Exempt Determination: 6/17/2020 Expiration Date: 6/16/2023

Study site(s): Washburn, ND and Underwood, ND Funding Agency: n/a

The above referenced human subjects research project has been determined exempt (category 1, 2(ii), 4(ii)) in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, Protection of Human Subjects). This determination is based on the revised protocol materials received 6/16/2020.

Please also note the following:

- If you wish to continue the research after the expiration, submit a request for recertification several weeks prior to the expiration.
- The study must be conducted as described in the approved protocol. Changes to this protocol must be approved prior to initiating, unless the changes are necessary to eliminate an immediate hazard to subjects.
- Notify the IRB promptly of any adverse events, complaints, or unanticipated problems involving risks to subjects or others related to this project.
- Report any significant new findings that may affect the risks and benefits to the participants and the IRB.

Research records may be subject to a random or directed audit at any time to verify compliance with IRB standard operating procedures.

Thank you for your cooperation with NDSU IRB procedures. Best wishes for a successful study.

Sincerely,

A handwritten signature in purple ink that reads "Kristy Shirley".

Kristy Shirley, CIP, Research Compliance Administrator

For more information regarding IRB Office submissions and guidelines, please consult https://www.ndsu.edu/research/for_researchers/research_integrity_and_compliance/institutional_review_board_irb/. This Institution has an approved FederalWide Assurance with the Department of Health and Human Services: FWA00002439.

INSTITUTIONAL REVIEW BOARD

NDSU Dept 4000 | PO Box 6050 | Fargo ND 58108-6050 | 701.231.8995 | Fax 701.231.8098 | ndsu.edu/irb

Shipping address: Research 1, 1735 NDSU Research Park Drive, Fargo ND 58102

NDSU is an equal opportunity university.