

**School-Based Initiative for Early Recognition of Depression Among Middle School Students**

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DNP 690: Scholarly Project III

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We have no conflicts to disclose.

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**Abstract**

The purpose of this project is to determine if a Patient Health Questionnaire (PHQ)-9 is useful in identifying, evaluating, and lowering depression in middle school students. Nurses will administer the Patient Health Questionnaire which consists of nine close-ended questions. The questions will be scored zero to 27. Any positive result (score greater than ten) will be referred to a school counselor for further workup. School counselors will then determine if there is a need to refer students for treatment with a mental health provider or primary care provider.

Keywords: pediatric care, depression, PHQ-9, adolescence, screening

### **School-Based Initiative for Early Recognition of Depression Among Students**

Depression and suicidal risks are global phenomena that affect both the young and the old (Maurer et al, 2018). Depression is described as a serious and common disorder that is characterized by feelings of sadness and loss of interest in activities that were once enjoyed by an individual (Torres, 2020). Depression influences how one thinks, feels and how one acts. The physical and emotional problems due to depression drastically reduces one's performance at work or school (Torres, 2020). Depression is a mental health disorder that affects people of all walks of life, and races, genders, ages, professions, and religious affiliates (Torres, 2020). Continuous sadness and lack of pleasure or interest in activities that were previously enjoyable or rewarding is depression (Maurer et al, 2018). Risk factors for depression include: chronic illnesses such as cancer, drug and alcohol abuse, genetics where a family member had depression or mental illness, loss or death of a loved one, and physical and mental abuse (Maurer et al, 2018). In the event of depression, one is likely to lose appetite, lack sleep, feel tired and experience poor concentration in activities that they undertake (Maurer et al, 2018).

Middle school staff including teachers and school nurses have also been highly hit with depression (Industrial Injuries Advisory Council, 2017). The prevalence of depressive disorder episodes in the United States rose drastically from 2019 to 2020 with the current rate in 2020 at 12% of the population (Levis et al., 2017). Although access to care has been increasing, 60% of young people with major depressive disorder did not get any mental health treatment in 2018 (Moriarty et al., 2015). If left untreated, depression can negatively impact psychological health, mental health, and academic progress (Anderson et al., 2015).

The Coronavirus pandemic (COVID-19) has negatively impacted children's mental health (CDC, 2020). During this time, emergency departments experienced an influx of

adolescence seeking mental health services. When compared to 2019, the amount of adolescents ages 12 to 17 utilizing mental health services rose 31% (CDC, 2020). This age group accounted for the highest proportion of mental health-related emergency department visits in 2020 (CDC, 2020). The CDC (2020) warns the lack of treatment for mental health conditions in children can have both short term and long-term consequences on health such as lack of sleep, fatigue, irritability, drug abuse and reckless behavior.

Depression has been cited as the major risk factor of suicide. WHO (2021) estimates 10-20 percent of children and adolescents experience mental health conditions. Mental health deterioration had worsened during the Covid-19 pandemic as a result of food insecurities in the home and disruption of daycare or healthcare services (WHO, 2021). Two percent of the suicide deaths occur for individuals who have been diagnosed and treated with depression (WHO, 2021). Globally, more than 700,000 people die of suicide annually (WHO, 2021). Among the suicide deaths, one is likely to have made 20 attempts to suicide (WHO, 2021). Other risk factors of suicide include drug and substance abuse, mental disorders especially depression and mood disorders, chronic illnesses, access to lethal means of committing the act, social isolation and loss of a loved one through death, separation or divorce (Nock et al., 2016).

According to the U.S. Preventative Task Force (USPSTF, 2017), adolescents should be screened regularly for depression as they are more likely to suffer from mental conditions. Screening instruments should be easy and quick to score, brief, readily available, and free of cost (Moriarty et al., 2015). The Patient Health Questionnaire (PHQ-9) was developed to be administered to adults. It has excellent sensitivity and diagnostic validity, which is why it is considered one of the best tools for screening depression (Gangulu et al., 2013). The PHQ-9 is a nine-item tool that scores each of the nine Diagnostic and Statistical Manual of Mental Disorders

criteria based on the symptom frequency (Levis et al., 2017). The questionnaire was first validated in 1999 and was later modified to fit adolescent criteria (Levis et al., 2017).

Screening an individual for depression means employing a screening questionnaire to determine if the patient is depressed or not or help determine the severity of depression (Ganguly et al., 2013). Nurses are generally advised and trained on how to use screening questionnaires which includes information regarding the cut-off threshold and allows them to identify whether the result is positive or negative (Levis et al., 2017). Nurses can administer screening questionnaires to adolescents and adults suspected of suffering from a mental health problem and determine if they are depressed (Levis et al., 2017). If the patient is depressed, treatment should begin as soon as possible to ensure a quick recovery (Levis et al., 2017).

The PHQ-9 is a well-known depression screening tool that can be employed in educational settings (Levis et al., 2017). School nurses need to recognize students suffering from depression and refer them to a school psychiatrist or nurse for diagnosis (Levis et al., 2017). Due to the poor recognition and assessment of depression and suicide cases, many of these cases remain unidentified until a serious act occurs (Allagaier et. al., 2012). Stigmatization due to depression and suicide also contributes to the numerous unreported cases (Allagaier et. al., 2012).

### **Review of Literature**

Depression screening scales are commonly used to diagnose major depressive disorder (MDD) in adolescents (Stockings et al., 2014). Ganguly (2013) administered the PHQ-9 to 233 adolescents and found the screening tool to be psychometrically sound due to it being brief, simple, and easy to use. They concluded that the PHQ-9 could help adolescents and their depression. The USPSTF (2017) recommends screening in adolescents. It employs systems to ensure an accurate diagnosis and effective treatment and advises against screening children aged

between six to eleven years old for depression due to insufficient evidence concerning the benefits versus harm in using the screening tool (Stockings et al, 2014).

Depression is expected to be one of the most significant causes of disability (Murray & Lopez, 2006). The PHQ-9 is a standard instrument used for screening depression. It is administered to confirm a positive PHQ-2 and takes two to five minutes to complete (Nease & Maloin, 2003). Antje-Kathrin et al. (2012) used an algorithm to test the validity of the PHQ-9. The PHQ-9 demonstrated high criterion validity and is recommended as a depression screening tool for adolescents to improve recognition rates in pediatric care.

In a study conducted by Kim et al. (2021) to assess the efficacy of PHQ-9 in evaluation of suicidal ideation in a primary care setting, the results confirmed the reliability and accuracy of the PHQ-9 in screening individuals with depression and suicide ideas. In most of the primary care settings, clinicians use depression tests as a tool to assess suicidal ideation. However, low detection rate was achieved since the depression tests are not specifically designed to detect suicide risk factors (Kim et al, 2021). Item nine of the PHQ-9 is primarily used. In a study by Beard et al. (2016) to determine the utility and the psychometric properties of PHQ-9 as a severity measure in individuals with psychiatric disorders, it was confirmed that PHQ-9 is a valid and reliable tool for measuring the severity of depression in clinical and research settings.

Healthy People (2030) aims to resolve mental health problems by prevention and by ensuring proper access to quality facilities. According to Healthy People (2030), an estimated 18.1% of adults in the United States have some mental illness, and 4.2% suffer from a serious mental illness. Moreover, the major cause of death in the U.S. is identified to be suicide, which is one of the consequences of depression and early screening may prevent further deaths from occurring (Healthy People, 2030). Understanding this can help alleviate the prevalence of

adolescent depression in the United States, which may reduce the future risk for adult mental health issues (Beard et al, 2016). This is important since teenage depression is an epidemic in the United States that has detrimental effects on physical health, psychosocial well-being, and academic productivity (Beard et al, 2016).

### **Purpose**

The purpose of this quality improvement (QI) project was to create an innovative policy which allowed school registered nurses to utilize a PHQ-9 screening tool for middle school students. A new algorithm followed by school nurses will guide parental notification and referral to appropriate services with positive scores. This will be done by changing current policies in place and creating an algorithm to guide the school nurses in their decision-making during interventions, and teaching nurses appropriate ways to ask questions. Allowing school nurses to screen for depression and training to recognize symptoms of depression will enable prompt intervention (Levis et al., 2017).

This study is designed to achieve the following outcomes: A change in policy, allowing nurses to screen students in Health and Physical Education class yearly, using the PHQ-9; nurse scoring and interpretation of the PHQ-9 results; and proportion of students referred out pre and post PHQ-9 implementation.

### **Methods**

This quality improvement project has a mixed method design. This project was conducted in a middle school in North Carolina which consists of 632 students, and a student to teacher ratio of 17. This study was approved by the Institutional Review Board (IRB) at Lenoir-Rhyne University. There was no risk for harm to staff or students during this project.

### **Participants**

Participants will be student human subjects of age 12 and older, who willingly provide assent to take the PHQ-9, and whose parents have not chosen to opt out. All students enrolled in a participating school in Gaston County will be eligible to be enrolled into the study.

### **Measures**

#### *PHQ-9 scores*

Data was collected and resulted based on questions answered on the PHQ-9.

#### *Referrals*

Algorithm used to guide nurses in decision making.

#### *Student profile*

Used for informational purposes only.

### **Procedure**

This will be a two-month quality improvement project implemented at a middle school, managed by the school nurses. Permission has been obtained to complete this project from the school board, middle school principal, and all procedures were approved by Lenoir-Rhyne Universities Institutional Review Board. Nurses will observe outcomes and number of referrals. Assent consent form was obtained from legal guardians at the beginning of the school year to screen children. Prior to screening, a letter was sent to the students and parents detailing the project and shall attach a copy of the actual screening tool, the PHQ-9. The principal sent a memo to all parents indicating that the students were free to opt out of the screening. An algorithm was used when screening adolescence (see Appendix B), and appropriate referrals will be made.

Nurses and counselors were presented information regarding the PHQ-9 by powerpoint presentation. Nurses were educated thoroughly on how to ask PHQ-9 questions, calculate results,



and how to follow the algorithm. Nurses went into the community and established a partnership with several mental health and primary care offices willing to accept referrals such as a private family practice office and pediatric offices. Screenings were performed in health and PE class. The total number of students screened was 98. The implementation of this project took place at a rural, midsized, title one middle school, serving about 700 students. There were two nurse screeners. There was no cost associated with the implementation of this project for the staff or facility.

Stakeholders include the director of school nurses, school counselors, and DNP student involved in implementing this QI project. DNP student will work together with the middle school staff to set up a good time to go over the intervention and educate regarding its importance. In addition, the staff will review the educational material presented.

Two assessment processes were used during implementation– informal and formal – to determine the impact of evidence-based changes. Informal evaluation included monitoring the project's activities and discussions with the school's staff. The formal assessment included medical record reviews and outcome measures.

Intervention commenced two months after the consent form was sent home, allowing adequate time to opt out. Every participant was assigned a specification code as an identity to keep them confidential. The demographic data collected included age, gender, ethnicity, and mental health history.

### **Data Analysis**

To evaluate the effectiveness of the depression screenings, school nurses reviewed the number of students referred out for mental health services. Descriptive statistics were used for samples to measure frequency of students who scored high on the PHQ-9.

### ***Scoring***

The tool consists of nine closed end questions whose score is between zero and 27. Of this, the participants recording a score higher than 10 will be recorded as a positive result. This indicates moderate to severe depression and a parent conference is initiated at this time and a referral made for treatment with the help from school counselors. Scores below 10 are considered none to mild depression and nurses will check in with the student as needed. The last unscored item on difficulty in functionality was not included in recorded scores. For the last item in PHQ-9, asking on suicidal thoughts, any score above 0 required immediate response using the school's crisis response which was already in place. Each student's parent was contacted with their results.

### ***Data Management Plan***

Participant's data is kept on excel data sheets using descriptive statistics. Unique coding was used (last five digits of students PowerSchool number), and no personal information of the participant was taken. Accessibility of the data was limited and only available to the implementer. All measures available in technology was used to prompt confidentiality and integrity in data handling throughout the project such as password protection. Also, the data is stored with school officials on hardcopies for a three-year period after the study results are shared with stakeholders. After three years, all data will be destroyed based on the ethical data management guidelines for DNP studies.

## **Results**

Table 1 shows the results of the PHQ-9 after given to all students in middle school who are enrolled in physical education and health class and is broken down even further into male and female categories. The last question asks the student: Over the past two weeks, have you had

thoughts that you would be better off dead, or thoughts of hurting yourself? In 8<sup>th</sup> grade, eight students had a score of at least one, 7<sup>th</sup> grade, and 6<sup>th</sup> grade had six students each test positive for the same question. During this time, the school initiated their protocol for mobile crisis to screen further. Parents were contacted and scores were discussed, even a score of zero. Overall, 14 students had a score of 10 or greater and they were referred to mental health services. The pie chart (*Figure 1*) shows the different ethnicities screened. Total number of students screened was 98 (n=98).

**Table 1**

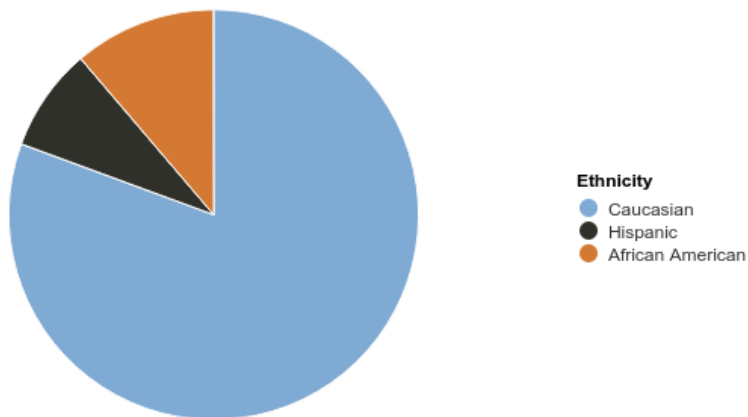
*Patient Health Questionnaire (PHQ-9)  
Results*

<i>Grade</i>	<i>Scores</i>		
	<i>Less than 10</i>	<i>Greater or Equal to 10</i>	<i>1 or More on Last Question</i>
6th Males	4 Caucasian, 1 Hispanic, 1 African American	1 Caucasian	0
6th Females	8 Caucasian, 1 Hispanic	1 Caucasian	6 Caucasian
7th Males	7 Caucasian, 2 African American	1 Caucasian	1 Caucasian, 1 African American
7th Females	10 Caucasian, 1 Hispanic, 3 African American	2 Caucasian	3 Caucasian, 1 Hispanic
8th Males	11 Caucasian, 2 Hispanic	3 Caucasian, 1 Hispanic	3 Caucasian

8th Females	13 Caucasian	2 Caucasian, 3 African American	3 Caucasian, 1 Hispanic, 1 African American
<b>Total</b>	53 Caucasian, 5 Hispanic, 6 African American	10 Caucasian, 1 Hispanic, 3 African American	16 Caucasian, 2 Hispanic, 2 African American

**Figure 1**

*Pie Chart of Ethnicity*



**Discussion**

The US Preventive Services Task Force strongly advises clinicians to begin screening adolescents for depression (Levis et al., 2017). This quality improvement initiative was conducted in response to this recommendation. The PHQ-9 has been extensively tested among adolescents in this middle school and found to have good specificity for detecting major

depression. The PHQ-9 is a promising screening tool for use among adolescents. This tool has already gained familiarity with clinicians as it has been used for screening adults.

Implementation of a depression screening tool in the school systems warrants careful assessment of community readiness among healthcare staff (McCormick et al, 2015). School-based screenings for depression has proved to be an effective means of detecting depression early and addressing the need for further evaluation (McCormick et al, 2015). If left unattended, a serious reduction in cognitive, emotional, and social development can occur which alters a student's chance at academic success (McCormick et al, 2015).

### ***Importance of Interventions***

Adolescent depression is a major public health problem (McCormick et al, 2015). Depressive episodes in adolescents are typically about seven to nine months and have about 70% recurrence rate (McCormick et al, 2015). Prompt intervention is necessary as the potential for adverse outcomes could occur including poor school performance, substance abuse, and suicide (McCormick et al, 2015). Early identification and intervention can relieve depressive symptoms, reduces relapses, and improve academic performance (McCormick et al, 2015). Schools touch the lives of most children and serve as an ideal setting for early detection of depression (McCormick et al, 2015).

Depression can be associated with other conditions including other mood disorders, stress, anxiety, grief, and sleep disorders (Moore et al, 2012). Scores of 10 or greater represent moderate to severe depression and scoring at least one on the final question represent suicidal ideation and should be immediately referred for services. Initiating a referral to primary care in line with guidance from the National Institute for Health and Clinical Excellence for monitoring depression (Moore et al, 2012).

### **Conclusion**

The main purpose of this project was to establish a policy change by utilizing the Patient Health Questionnaire (PHQ-9), that focused on the screening of depression in the middle school setting. The algorithm that was designed for this project helped guide the counselor and the nursing staff, depending on the score, to review and plan an action in order to implement the protocol that is desired. Students who are experiencing depression may display various behaviors, as well as poor performance in their academic results. It is important that school nursing staff and counselors become trained to be able to highlight the need of counseling and therapy during the earlier stages and help contribute to an overall change (Allagaier et al, 2012).

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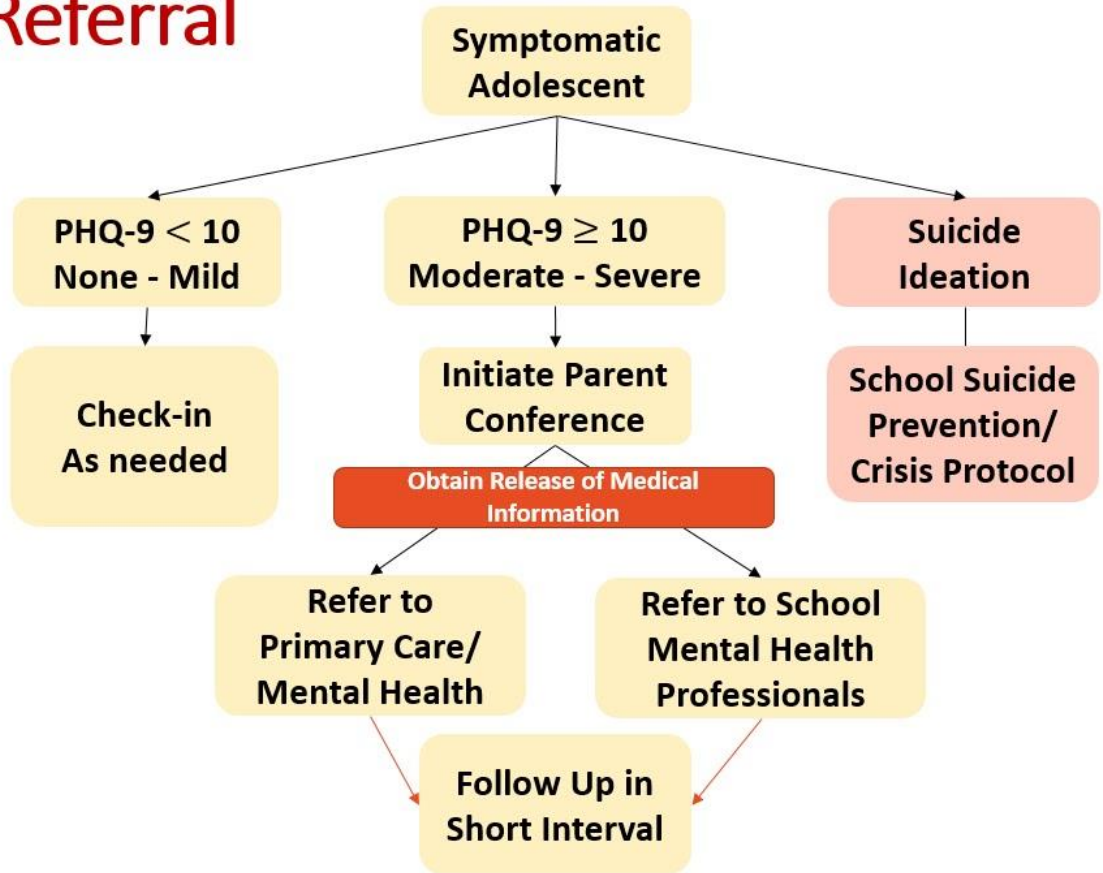
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# Referral



Appendix B: Algorithm for screening adolescence using PHQ-9