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Enhancing Depression Screening for the Adolescent Population in the Pediatric Emergency Department by Utilizing the Patient Health Questionnaire: A Quality Improvement Project

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Recommended Citation

Enhancing Depression Screening for the Adolescent Population in the Pediatric Emergency

Department by Utilizing the Patient Health Questionnaire:

A Quality Improvement Project

Chelsea Alvarez, BSN, RN

A DNP project submitted in partial fulfillment of the requirements for the degree of Doctor of

Nursing Practice

Ranbir Bains, Ph.D, APRN, CPNP; Project Faculty Advisor

Carolyn Bradley MSN, RN, CCRN; Practice Mentor

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May 2022

This is to certify that the DNP Project Final Report by
Chelsea Alvarez
has been approved by the DNP Project Team on
[04/18/2022]
for the Doctor of Nursing Practice degree

DNP Project Faculty Advisor: [Ranbir Bains, Ph.D, APRN, CPNP]
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Approval Page

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TO: Chelsea Alvarez

FROM: Janet Parkosewich, DNSc, RN, FAHA, Nursing Scientific Review Sub-Committee Chair
(On behalf of the Yale New Haven Health System Nursing Research and Evidence-Based
Practice Committee)

DATE: 7/14/2021

RE: Enhancing Mental Health Screening for Adolescents in the Emergency Department by Utilizing
the Patient Health Questionnaire

Thank you for submitting your Scholarly Project Application.

On behalf of the Nursing Scientific Review Sub-Committee of Yale New Haven Health Nursing Research
and Evidence-Based Practice Steering Committee, your scholarly has been reviewed and endorsed.

After committee review, the main purpose of the project was determined to improve the quality of care.
Given the nature of the project, it is not seeking to generalize knowledge, generate new knowledge, or
create a scientific inquiry. The project is not considered human subjects research. Your application will
be entered into the Yale New Haven Health System Office of Privacy and Corporate Compliance
database with **AIM # 708**. Your approval will expire in 12 months from the date of this letter.

The committee suggested that you determine the passing grade on the post test and if nurses failed
once, what would the remediation plan be? Retake? How many times or would they receive 1:1 review
of material?

Please remember to inform me (janet.parkosewich@ynhh.org) when you begin work on your project
and conclude work at Yale New Haven Health. We also ask for an abstract upon completion of the
project.

Please let me know if you have any questions.

Table of Contents

Abstract

Background
Mental health disparities make up 16% of the global burden of disease and injury in people ages 10-19. Many cases of mental health are unidentified and left untreated. Failure to address mental health disorders in children can lead to poor outcomes of health and well-being. Evidence-based practice supports the utilization of screening tools such as the Patient Health Questionnaire-9 (PHQ-9) for depression screening in adolescents ages 12-18 years.

Objectives

By implementing the PHQ-9 in the pediatric emergency department, the goals for this quality improvement project were to increase staff knowledge on the PHQ-9, improve staff screening compliance, and to improve the identification of depression.

Methods

The Plan-Do-Study-Act (PDSA) model was utilized during the implementation and completion of this quality improvement project. From July 2021 to November 2021, staff nurses were educated on the PHQ-9 depression screening and then evaluated by a seven question pre- and post- test. Implementation of the PHQ-9 in the PED was then initiated and an evidence-based quality improvement algorithm was used to standardize treatment of patients scoring positive on the PHQ-9 in the PED. Based on the PHQ-9 algorithm and the overall score on the screening tool, specific resources were provided for the patient.

Results
The overall objective to increase screening of patients in the PED at risk for depression was achieved. Although rates of documented depression screening increased from 0% to 28.95% over a four-month project timeframe, the goal of increasing screening rates to 50% was not reached. The 1:1 educational intervention increased staff knowledge about the PHQ-9 depression screening and the implementation process, meeting the educational objective of 100% of nurses staffed in the PED to be educated and trained on the PHQ-9 screening tool.

Conclusion
A ten-minute educational session with the project manager was determined to be successful as evidenced by the pre- and post-test results. Results depict an improvement in depression screening rates in the PED. Several advantages of this project were identified: ease of administering the tool, ease of documenting the scores through the patient's electronic health record, and low cost. Thus, the overall impact in screening those in the PED resulted in the identification and evaluation for depression in a population that had not previously been screened.

Problem Identification, Development of Clinical Question, and Evidence Review

Background and Significance of Problem

According to the World Health Organization (2021), mental health disparities make up 16% of the global burden of disease and injury in people ages 10-19 years old. Although half of all mental health conditions start around the ages of 14 years old, many cases are unidentified and left untreated. Failure to address mental health disorders in children can lead to poor outcomes of health and well-being. Unaddressed mental health disorders can lead to violence, sexual risk behaviors, academic failure, substance abuse, chronic physical disorders, and suicide (Wenhua, 2017). The United States Preventative Services Task Force (USPSTF) has recognized supportive evidence in identifying major depressive disorder in adolescents (12-18 years of age) by using screening tests such as the Patient Health Questionnaire (PHQ-9) (2016). It is essential to implement screening measures for mental health illnesses for this vulnerable population to quickly identify those at risk for serious health outcomes. Timely identification of depression and other mental health disorders among adolescents may ensure they receive appropriate treatment and resources.

Description of Local Problem

A hospital in Connecticut has its own pediatric emergency department. The pediatric emergency department (PED) cares for behavioral health patients in addition to others. The patients presenting to the PED needing a psychiatric evaluation are screened for suicidal ideation. Patients presenting to the PED with complaints that are not related to mental health illnesses are not screened for depression or suicide.

Organizational Priority

In 2015-2016, the Connecticut hospital was ranked among the best in the nation for six of its pediatric specialties published online by the U.S News and World Report (Yale New Haven Health, 2021). Among many different specialties, the psychiatric specialty was not included in its rankings. Thus, an organizational priority is for the behavioral and mental health specialties to be integrated. One requirement involves the implementation of a suicide and depression screening such as the Patient Health Questionnaire for all patients ages 12 years and older.

Focused Search Question

To ensure best practices for the implementation of the Patient Health Questionnaire in ages 12 and over, the following clinical question was used for the literature search: In youth 12 years and older presenting to the emergency department (P), how does the use of the Patient Health Questionnaire-9 (I) compared to current practice (C), affect the identification of those at risk for depression (O)?

Evidence Review

External Evidence. The following databases were searched for evidence; CINAHL and MEDLINE. The key words investigated included Patient Health Questionnaire, PHQ-9, depression screening, suicide screening, pediatric depression screening, pediatric suicide screening, and emergency department. Adding a Boolean operator such as "and" between two key words helped narrow down the initial searches. For example, depression screening and emergency department prompted 25 articles for review in CINAHL. Limits and filters were utilized for all searches. Filters such as the English language, full text, and published between 2015-2021 were included. For article selection, exclusion criteria consisted of qualitative and observational design studies.

Internal Evidence. The hospital started implementing the Patient Health Questionnaire for those at risk for suicide and depression among the Pediatric Specialty Centers in 2020. While collecting baseline data is still in progress, the specialty centers have seen positive results in identifying children at risk that would have ordinarily been missed. With the increasing identification of children scoring positive for depression with the Patient Health Questionnaire at these centers, it is essential to have a screening process in the pediatric emergency department (E. Setzer, personal communication, January, 2021). The goal is to identify children at risk for depression and suicidality and prompt timely mental health interventions for them.

Evidence Appraisal, Summary, and Recommendations

A level of evidence synthesis was created for the topic of the PHQ-9 utilization. Six articles were chosen that met the search criteria and were included in the evidence review. The level of evidence for the six articles was a combination of levels 2, 4, and 6. The six selected articles focused on expected outcomes of the PHQ-9 screening in primary care and in the emergency department. The PHQ-9 were associated with improved screening for depression among adolescents and improved referral rates to mental health services (Bhatta, 2018). Appendix A provides the evidence search process for the focused search question.

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Project Plan

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Project Goals

1. To increase staff knowledge on the Patient Health Questionnaire.

2. To improve staff compliance of new practice change.

3. To improve the identification of depression in adolescents in the PED.

Project Framework

The framework methodology used for this quality improvement project was the Plan-Do-Study-Act (PDSA) model created by W. Edward Deming. The PDSA model has been utilized in health care as small cycles that can be accomplished in a timely manner (Connelly, 2021). To begin the first PDSA cycle, one first plans the change, then implement the change, study collected data from the change, and then act to make modifications for the next cycle if needed (Connelly, 2021). For this quality improvement project, three cycles of the PDSA model were completed.

PDSA Cycle 1. The first cycle of the PDSA method consisted of assembling a team, identifying aims of a project, and creating a PICO question. The "Do" phase of cycle 1 was for synthesizing evidence based on the PICO question that was made. The "Study" phase was to formulate evidence table and synthesis tables that supports the PHQ-9 intervention (See Appendix A). Lastly, the "Act" phase consisted of reviewing all of the evidence and determining the need for PHQ-9 intervention.

PDSA Cycle 2: The second cycle focused on educating the nurses on PHQ-9 implementation and providing pre/post-tests. For instance, "Plan" focused on drafting aim statements of the PHQ-9 implementation in the PED. Aim statements focused on improving nurse knowledge on the PHQ-9 screening tool, improving PHQ-9 screening to all patients 12 years and older in the PED, and improving referrals to those patients scoring positive for depression in the PHQ-9 screening tool. The "Do" phase consisted of building an algorithm that involves decision making tools for specific scores of the PHQ-9 (See Appendix B) and educating the nurses on the PHQ-9 screening. The "Study" phase focused on evaluation of the pre/post-education surveys and lastly, the "Act" phase focused on 1:1 debriefing with those who have not completed the training session regarding the PHQ-9 implementation.

PDSA Cycle 3: The "Plan" phase consisted of planning the pilot of PHQ-9 screening in the PED on all children ages 12 years and older based on the algorithm that was created in the second cycle. The goal was created for 50% of patients in the PED who are 12 years of age and older to be screened in the first month of implementation of the PHQ-9. The "Do" phase was the implementation of the PHQ-9 in the PED. The "Study" phase included data collection and analysis regarding positive PHQ-9 scores and monitoring staff adherence with screening patients. Lastly, the "Act" phase consisted of reviewing screening success in the PED. If nursing adherence was not at least 50%, the team was to refer to cycle 2 of the PDSA method. The results of the outcomes of the PHQ screenings completed by the nurses were communicated regularly to staff nurses during improvement huddles throughout the day and monthly staff meetings. Internal and external dissemination was also included in this phase of the PDSA cycle.

Context

Setting and Population. The PED sees more than 32,500 children annually (Yale New Haven Health, n.d.). In 2020, the PED cared for a total of 30,366 patients with behavioral health patients, which is about 10% of patient visits. Before the coronavirus pandemic, the average daily census was about 125 patients a day. Since then, for 2020 and so far for 2021, the average daily census is about 65 patients a day with about 50% of patients being 12 years and older (E. Setzer, personal communication, March 1, 2021). The nurse-to-patient ratio is 1:3.

Stakeholders. Several multidisciplinary teams were needed to make this project successful. Key stakeholders include the department chair, PED management, PED educator, social work, child psychiatry, MDs, advanced practice providers, and nurses. In addition to PED staff members, IT specialists were needed for the building of the PHQ-9 into the electronic

health record (EHR). Lastly, patients 12 years and older were needed for inclusion of depression screening in the PED.

Barriers. A barrier to implementation of the PHQ-9 in the pediatric emergency department included the reduced availability of PHQ-9 screening tool in only English and in Spanish. With the diverse population that commonly presents to the emergency department, patients from different backgrounds may be screened inaccurately due to language barriers, which can inadvertently impact screening rates (Mansour et al., 2020). Perhaps, the utilization of qualified interpreters or video-assisted interpreters provided by the hospital can aid in overcoming this possible obstacle. A second barrier to PHQ-9 implementation was the potential increase in the number of mental health services that may be needed after screening. A challenge was to arrange a particular algorithm for mental health services and resource utilization to those patients screening positive or high on the PHQ-9 screening tool.

Timeline

A timeline and project status report for this project can be found in Appendix C.

Resources and Budget

The resources for this project include the primary project manager, Chelsea Alvarez BSN, RN who was responsible for the education of staff members, data collection and analysis, and the dissemination of project results. The project manager provided 1:1 debriefing with the staff nurses when the screening compliance was not at goal of 100%. Lastly, the project manager was also involved in data analysis. A multidisciplinary team approach was necessary for this project's success. Other team members included the department chair, PED management, PED educator, social work, child psychiatry, and providers such as MDs, mid-levels, and nurses.

Staff members were educated on the PHQ-9 implementation during their scheduled workdays along with staff meetings and huddles. Table 1. describes the anticipated materials for project implementation. All materials needed were provided by the pediatric emergency department without any additional costs for the project manager.

Table 1.

Anticipated Project Costs for Implementation and Evaluation of Project

Materials	
Staff Meeting and Huddles	$0.00
Staff Education	$0.00
Laminated PHQ-9 Scales	
HP Office20 8.5x11"	$0.00
Laminating Machine (in PED office)	$0.00
Laminating Sheets, 26 Count, 8.5" x 11"	$0.00
Dry erase markers 26 Count	$0.00
Total Estimated Cost	$0.00

Ethical Review. This project involved educating the nurses on PHQ-9 depression screening and the implementation of this screening to all patients in the PED ages 12 years and older. This project did not require Institutional Review Board Approval due to the project meeting criteria for quality improvement (see Appendix D). Approval for project implementation has been granted in July 2021 by the Nursing Scientific Review Committee at the hospital. A

Letter of Intent and Scholarly Project Application was required for submission for approval. (See

Appendix E for Letter of Intent and Scholarly Project Application).

Data Collection Plan. All data was collected retrospectively by looking back at

completed screenings of the PHQ-9 through the electronic health record's (EPIC) dashboard via

Tableau software. No manual data collection was necessary. Tableau allowed the project

manager to run EPIC reports on data collection, without having to audit individual patient charts.

The project manager collected data from the pre/post-tests individually and overall test scores

were entered on excel. The percentages of overall scores pre and post education were displayed

in a table for the comparison on results. In addition, nursing education completion was recorded

on an attendance list. Results of the tests remained confidential, and the nurses were coded in

excel file using identification numbers starting with 1. Nursing screening compliance was

collected through EPIC dashboard reports via Tableau software. Other data that was collected

through EPIC dashboard reports via Tableau software include data on positive scores of the

PHQ-9 and data on positive PHQ-9 scores needing additional resources such as social work

referral.

Data Analysis Plan. The analysis and interpretation of screening and nursing compliance

data will be completed through the EPIC dashboard reports as stated above in the data collection

plan. Monthly progress on three metrics will be tracked:

1. Number of nurses educated in the PED

2. Number of patients screened in the PED

3. Number of patients screened severe risk

4. Number of patients screened moderate risk

5. Number of patients screened mild risk

6. Number of patients screened minimal risk

The analysis and interpretation of pre/post-tests were completed by the DNP student.

Project Implementation

Descriptions of Project Implementation

From July 2021 to November 2021, the algorithm for decision making (Appendix B) in the PED based on PHQ-9 scores were displayed throughout the unit for nurses and providers to use as a guideline during implementation. Education of all staff nurses on the PHQ-9 depression screening (Appendix F) was completed the first week of July. Staff nurses were provided a pre- and post-test to measure education and understanding of the PHQ-9 (Appendix G). Post-tests were provided immediately after education and were reviewed 1:1 with the project manager after completion.

From July 2021-November 2021, laminated PHQ-9 screening tools were placed in all 20 rooms in the PED with a dry erase marker. Once triaged and roomed for treatment, those who met criteria for screening (12 years and older), were provided the PHQ screening tool to fill out while waiting to be seen by the provider and nurses. Once the PHQ-9 was filled out, the bedside nurse obtained and submitted the answers of the screening tool into the patient's electronic health record, automatically calculating the overall score. Based on the PHQ-9 algorithm and the overall score on the screening tool, interventions would be initiated. Interventions included adding printed resources to the discharge paperwork, notifying the patient's primary care provider upon discharge to PED, obtain social work consult, and lastly, obtaining a suicide screening using the Columbia Suicide Severity Rating Scale (CSSRS).

Evaluation

Project Results

The purpose of this quality improvement project was to implement the Patient Health Questionnaire-9 (PHQ-9) depression screening for all patients ages 12 and older presenting to the (PED). The following data were tracked monthly from July through the first week of November of 2021:

1. Number of nurses educated in the PED
2. Number of patients screened in the PED
3. Number of patients screened severe risk
4. Number of patients screened moderate risk
5. Number of patients screened mild risk
6. Number of patients screened minimal risk

Process Measures. To evaluate effectiveness of this project throughout implementation, three process measures were calculated. The first measure was the completion of nurse education in the PED with a goal of 100% of staff member attendance with the project manager. The second process measure consisted of the completion of screened patients 12 years and older with a goal of 50% who met criteria in the first month of implementation. The third process measure was the identification of those scoring positive for depression on the PHQ-9 with a goal of 100% of all patients scoring positive for depression will be identified by the PHQ-9 tool.

Outcome Measures. Outcome measures were used to reflect the impact of the PHQ-9 implementation in the PED. Three main outcomes were included: Improvement of overall nurse knowledge on the PHQ-9 screening, improvement of PHQ-9 screening to all patients ages 12 years and older presenting to the PED, and improvement of appropriate referrals to those patients scoring positive in the PHQ-9 screening.

Analysis. A pediatric emergency department (PED) consisting of 49 nurses was asked to use the PHQ-9 screening tool with patients ages 12 and older. All nurses staffed in the PED participated in the ten-minute teaching intervention completed by the project manager. A pre-and post-test on the PHQ-9 implementation in the PED was provided before and after education. The

results are illustrated in Figure 1. Pre-test scores averaged 47%, whereas post-test scores averaged 98%. The mean difference between pre-and post-test scores was a 50% improvement in test scores.

Figure 1.
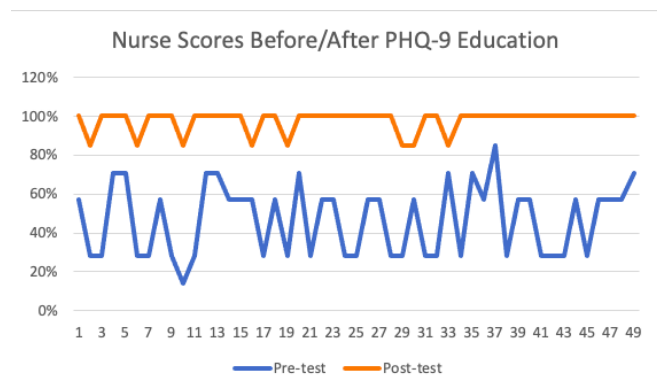
During the next phase of the quality improvement project, screening with the PHQ-9 was initiated. All patients screened met the inclusion criteria of over 12 presenting to the PED for either medical or behavioral health chief complaints. The data from July-November were examined to determine the compliance of nurses screening those patients in the PED who met inclusion criteria. Post-implementation auditing found that in the first month of implementation in July, screening compliance was 9.69% (See Figure 2.) The data supports an upwards trend in compliance except for August, which had the lowest compliance score (6.45%). Additional interventions to increase nursing compliance scores were implemented in September. From September to the first week of November, an increase in compliance scores is shown, with the first week of November being the highest of all scores (28.95%).

From July to the first week of November, a total of 494 patients were screened. Out of the 494 screened, 4.66% were a severe risk for depression, 7.49% moderately severe risk, 6.07% moderate risk, 4.25% mild risk, and 19.03% minimal risk. Of those screened, 13.36% answered "yes" to question 9 asking about suicidal ideation (See Figure 2.).

Figure 2.

ED Campus	Year of ED Arrival Time	Quarter of ED Arrival Time	Month of ED Arrival Time	BH Screened	Encounters Severe Risk	% of Encounters Severe Risk	Encounters Moderately Severe Risk	% of Encounters Moderately Severe Risk	Encounters Moderate Risk	% of Encounters Moderate Risk	Encounters Mild Risk	% of Encounters Mild Risk	Encounters Minimal Risk	% of Encounters Minimal Risk	Encounters Answered Yes #9	% of Encounters Answered Yes #9
YSC-Pedi	2021	Q3	July	3	1	1.06%	7	7.45%	4	4.26%	9	9.57%	24	25.53%	4	4.26%
			August	8	3	5.00%	5	8.33%	3	5.00%	3	5.00%	9	15.00%	7	11.67%
			September	33	4	3.39%	8	6.78%	7	5.93%	4	3.39%	25	21.19%	17	14.41%
		Q4	October	67	14	6.64%	16	7.58%	15	7.11%	5	2.37%	33	15.64%	37	17.54%
			November	3	1	9.09%	1	9.09%	1	9.09%	0	0.00%	3	27.27%	1	9.09%
Grand Total				114	23	4.66%	37	7.49%	30	6.07%	21	4.25%	94	19.03%	66	13.36%

The project data support that this quality improvement project's overall goal and objective to increase screening of patients in the pediatric emergency department at risk for depression were achieved. However, the goal of increasing screening rates to 50% was not reached with the latest screening compliance of 28.95% in the first week of November. In addition, the 1:1 educational intervention increased staff knowledge about the PHQ-9 depression screening and the implementation process, meeting the educational objective of 100% of nurses staffed in the PED to be educated and trained on the PHQ-9 screening tool.

Barriers Encountered During Implementation. One limitation that impeded universal screening of all patients was a lack of time for busy PED nurses. With competing demands, staffing shortages, and high acuity patients in the emergency department, it was a challenge for the nurses to screen all eligible patients consistently. To overcome this barrier, a better practice advisory (BPA) or "pop-up" in the eligible patient's electronic health record (EHR) was created. This BPA would trigger for any of the nurses who clicked on the patient's chart. The BPA would continue to trigger until the nurses entered the PHQ-9 results. Another barrier identified included the daily turnover of nurses in the PED. Due to reduced RN staffing, nurses from other units were floated to the PED during implementation. These nurses were not aware of the practice change. Lastly, the percentage of referrals to those who scored positive on the PHQ-9 in the PED prior to discharge was not obtained. With the data collection being solely through EPIC

electronic health record through Tableau software, informational technology was unable to create a system to collect this outcome measure by the time of data collection.

Return on Investment. The total project timeline was four months: from July 2021 to November 2021. Since then, the PHQ-9 has continued to be collected on those patients presenting to the PED who are 12 years of age and older where PED management and educators continue to monitor compliance of PHQ-9 screening. At this time, the target outcome goal of 100% compliance was not met despite efforts to the EHR such as incorporating an automatic BPA reminder for the nurses. The project did, however, show an increase in depression screening and identification. The project also showed an overall increased knowledge in the PHQ-9 depression screening in staff nurses in the PED as evidenced by the pre- and post- quiz results. Overall, this project did not require any additional resources in terms of capital and was a positive return on investment.

Dissemination

New evidence is communicated internally and externally to effectively improve patient outcomes (Melnyk & Fineout-Overholt, 2019). Thus, the results of the PHQ-9 implementation in the PED will be disseminated by utilization of an executive summary, project abstract, and project poster and presentations. Reporting project results will be an essential step toward incorporating a standardized depression screening policy in the PED.

Internal dissemination of the new practice change includes reporting within the hospital where this quality improvement project was implemented. After project implementation, the abstract and an executive summary (See Appendix H) will be submitted.

To expand the knowledge on PHQ-9 implementation in the PED and to encourage similar initiatives throughout other healthcare systems, external dissemination is necessary (Cullen et al.,

2018). Thus, a project poster will be prepared for presentation to a local college campus and its students in April 2022 (See Appendix I). The project poster will include the project title, interprofessional team members, purpose statement, rationale/background, project framework, practice change, implementation strategies, evaluation of results, conclusion, and implications for practice

Key Lessons Learned

Although patients 12 years and older presenting to the PED for behavioral health chief complaints were evaluated and treated for depression prior to implementing the PHQ-9 screening, a standardized, evidence-based practice for depression screening for all patients was not in place. The lack of a standardized procedure for screening for depression may have led to missed opportunities in identifying those in need of mental health evaluation. For example, about 13% of patients screened answered "yes" to the suicidal ideation question on the PHQ-9 tool. If there was no screening in place at the time, these patients would have been unidentified during their ED stay.

The plan-do-study-act (PDSA) model is the practical framework that guided the PHQ-9 implementation in the PED as rates of documented depression screening increased from 0% to 28.95% over a four-month project timeframe. Following the implementation of the PHQ-9, those identified as mild, moderate, moderate-severe, and severe risk for depression were provided with resources prior to discharge from the PED.

Nonetheless, after piloting the PHQ-9 in the PED, advantages identified were ease of administering the tool and documenting the scores through the patient's EHR, and low cost. These influenced the unit to continue with the PHQ-9 implementation even after the project was completed. Thus, screening in the PED resulted in early identification and evaluation for

depression in a population that had not previously been screened. Despite recommendations from the United States Preventative Task Force (USPSTF) and the American Academy of Pediatrics (AAP), two-thirds of adolescents with depression are unidentified by their primary care provider (Bose et al., 2021). Screening patients for depression at every PED visit may help bridge the gap in identification and allocation of treatment and resources.

Sustainability Plan

A practice change's sustainability is met when the initiative becomes a new way of practice despite staff changes and organizational characteristics (Silver et al., 2016). Although reaching sustainability is challenging after the initial enthusiasm has faded, it is essential to find appropriate strategies to maintain the intended practice change. For the PHQ-9 depression screening to be sustained in the PED, continued on-site education and staff monthly reminders will be applied. Lastly, information for this project and its results will be disseminated to the key stakeholders such as hospital administration, nurse educator in PED, social work team, psychiatry, physicians, advanced practice providers, and staff nurses.

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Appendix A

LEVEL OF EVIDENCE SYNTHESIS

LEGEND

1= DeVylder et al., 2019
2= Mansour et al., 2020
3= Ganguly et al., 2013
4= Allgaier et al., 2012
5= Bhatta et al., 2018.
6= Richardson et al., 2010

DR. SUSAN L. DAVIS, R.N.,
& RICHARD J. HENLEY
COLLEGE OF NURSING
Sacred Heart University

X (copy symbol as needed)	1	2	3	4	5	6
Level I: Systematic review or meta-analysis						
Level II: Randomized controlled trial			X			X
Level III: Controlled trial without randomization						
Level IV: Case-control or cohort study	X			X		
Level V: Systematic review of qualitative or descriptive studies						
Level VI: Qualitative or descriptive study, CPG, Lit Review, QI or EBP project		X			X	
Level VII: Expert opinion						

EVIDENCE SYNTHESIS TABLE

SYMBOL KEY

↑ = Increased, ↓ = Decreased, —
= No Change, NE = Not Examined,
NR = Not Reported (introduced at
beginning but never reported at the
end), √ = applicable or present

LEGEND

1= DeVylder et al., 2019 2=
Mansour et al., 2020 3= Ganguly et
al., 2013 4= Allgaier et al., 2012 5=
Bhatta et al., 2018. 6= Richardson et
al., 2010

DR. SUSAN L. DAVIS, R.N.,
& RICHARD J. HENLEY
COLLEGE OF NURSING
Sacred Heart University

Article Number	1	2	3	4	5	6
Improved depression screening	NE	↑	↑	NE	↑	↑
Improved suicide screening	↑	NE	NE	NE	NE	NE
Referral/resources to mental health services	NE	↑	NE	NE	↑	NE
Sensitivity of PHQ-2 and PHQ-9	NE	NE	↑	—	NE	↑
Validity of PHQ-9	NE	NE	↑	↑	NE	NE
Implementation of the PHQ-9	√	√	√	√	√	√

Numbers correspond to articles, reference list at the end of presentation

Citation	Conceptual Framework	Design/ Method	Sample/Setting	Major Variables Studied and Their Definitions	Outcome Measurement	Data Analysis	Findings	Level of Evidence/ Quality	Quality of Evidence: Critical Worth to Practice
Author Year Title County Funding	Theoretical basis for study		Number Characteristics Exclusion criteria Attrition	Independent variables IV1 = IV2 = Dependent variables	What scales used - reliability info (alphas)	What stats used	Statistical findings or qualitative findings	Level =	Strengths Limitations Risk or harm if implemented Feasibility of use in your practice
Article 1									
DeVylder et al., 2019. Assessment of selective and universal screening for suicide risk in a pediatric emergency department.	N/A	Retrospective cohort study.	**Setting**: Urban pediatric ED in the U.S. **Sample**: youths aged 8-18 years with behavioral and psychiatric presenting problems. And Youths 10-18 years of age with medical presenting problems. **Inclusion criteria:** Youth patients presenting to the pediatric ED with medical presenting problems (10-18 years old) and those presenting with psychiatric and behavioral presenting problems ages 8-18 years **Exclusion criteria:** Those younger than 8 years old and older than 18	IV1= ASQ screen at baseline ED visit IV2= suicide screening to all patients. Dependent variables = Subsequent ED visits with suicide related presenting problems (ideation or attempts) based on HER and death by suicide	Ask Suicide Screening Questions (ASQ): 4 item nonproprietary suicide risk screening instrument that can be administered to patients in the pediatric ED by nurses. Sensitivity of 96.9% and specificity of 87.6%.	Survival analysis and follow up using relative risk.	The complete sample was 15,003 youths (7,044 [47.0%] male; 10,209 [68.0%] black; mean [SD] age, 14.5 [3.1] years at baseline). The follow-up for the selective condition was a mean (SD) of 1133.7 (433.3) days; for the universal condition, it was 366.2 (209.2) days. In the selective condition, there were 275 suicide-related ED visits and 3 deaths by suicide. In the universal condition, there were 118 suicide-related ED visits and no deaths during the follow-up period. Adjusting for demographic characteristics and baseline presenting problem, positive ASQ screens were associated with greater risk of suicide-related outcomes among both the universal sample (hazard ratio, 6.8 [95% CI, 4.2-11.1]) and the selective sample	Level IV/Good quality	**Strengths:** real-world comparison of the consecutive implementation of selective and universal screening approaches within the same setting as routine care. **Limitations**: No access to data on mental health treatment after screening and thus could not study whether identification of suicide risk by screening resulted in greater engagement in mental health services and reduced future risk of suicidal behaviors. Furthermore, at least some of this variance from protocol was due to clinical judgment, as nursing staff sometimes administered the ASQ in the selective screening condition to medical and surgical patients who they felt to be at risk, although this was not consistently documented. Some youths were not screened even though they met inclusion criteria, which likewise reflects our use of a real-world ED setting for this study; youth sometimes cannot be fully assessed in ED triage due to aggressive behavior, cognitive issues, lack of responsiveness, or urgent need for medical attention, while other missed screens may have simply been due to oversight.

			years old.				(hazard ratio, 4.8 [95% CI, 3.5-6.5]		
Article 2									
Monsour et al., 2020. Implementing the Patient Health Questionnaire modified for adolescents to improve screening for depression among adolescents in federally qualified health center. Longbranch, NJ USA	N/A	BMJ Quality Improvement Reports	**Setting**: Monmouth Medical Center: Federally Qualified Health Center **Sample:** All adolescents ages 12-17 years who presented for a well-child visit. **Exclusion criteria:** Children younger than 12 years old and adolescents coming for a visit due to illness. Patients aged 18 years or older. Adolescents coming for a visit due to illness	IV: PHQ-A screening during well child visits ages 12-17 years of age. DV: Improvement in the screening, diagnosis, and treatment of depression in children from ages 12-17 years.	PHQ-A (modified for adolescents) with a sensitivity of 73% for a positive test and a specificity of 94%.	N/A	Adolescent depression screening rate significantly improved within 6 months of implementing project. Standardized screening tests with a scoring system help providers to identify and monitor depression symptoms using common language, especially in the outpatient clinical setting where patient may be seen by different providers.	Level VI/Low quality	**Strength:** Emphasizes the need for screening for depression due to helping physicians identify patients and providing appropriate referrals and resources for those patients. **Limitations:** Use of a single centered study with a smaller sample size. Another limitation includes the missed screenings during some visits in teenage population due to the inability to add a practice prompt in the EHR.	
Article 3									

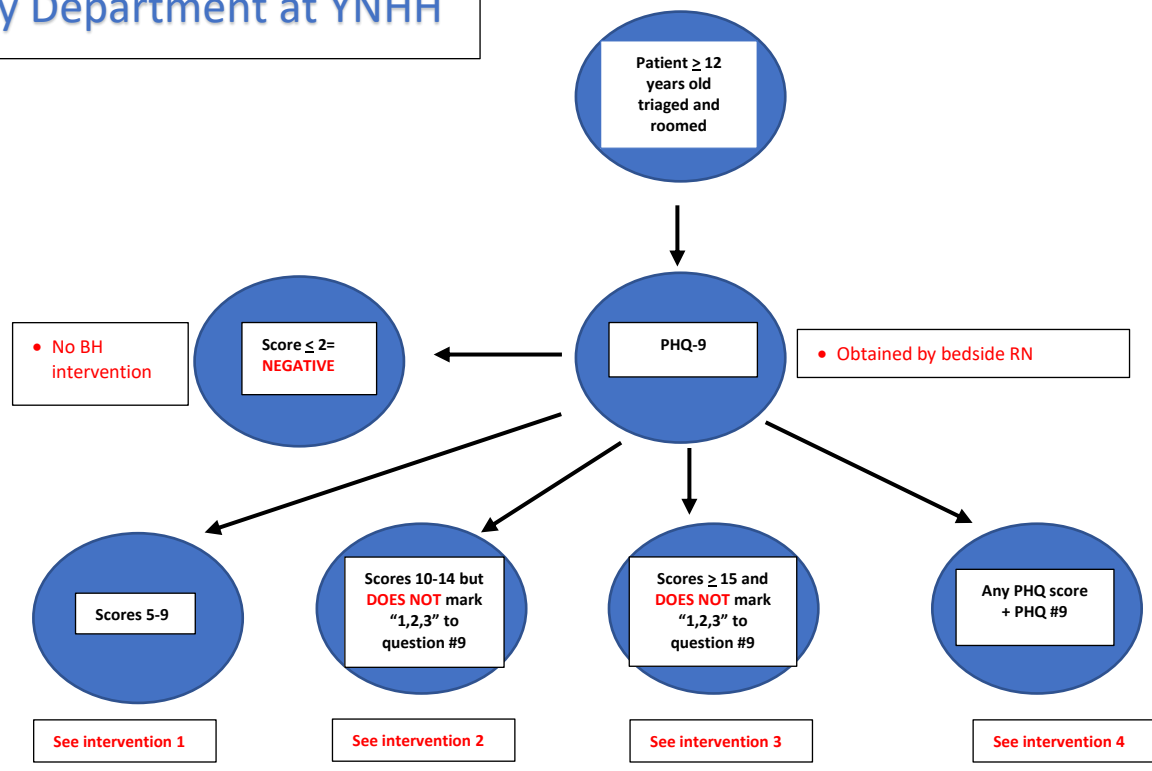|									
Ganguly et al., 2013. Patient Health Questionnaire-9 as an effective tool for screening of depression among Indian adolescents. Kolkata, India	N/A	Double-blinded. Randomized Controlled Trial	**Setting**: Four English medium schools in Kolkata, India where the Adolescent Health Clinic of Medical College was conducting school-health activities. **Sample**: 233 students **Inclusion criteria:** Students in the Four English medium schools in Kolkata, India **Exclusion criteria:** Students greater than 18 years of age and younger than 14 years of age.	IV1: Patient Health Questionnaire screening tool and Beck Depression Inventory(BDI) tool IV2: Semi-structured psychiatric interviews (blinded) DV: Validity, reliability, and accuracy of the Patient Health Questionnaire among Indian adolescents.	PHQ-9 (sensitivity 87.1%; specificity 79.7%); Beck Depression Inventory (r=.76;p=.001) Depression diagnosis based on International Classification of Diseases, 10th Revision	Patient Health Questionnaire examined with test-retest reliability with intraclass correlation coefficient. Cronbach's alpha coefficient for internal consistency. Convergent validity of PHQ-9 and BDI, authors correlated the total scores of both scales with the help of Pearson's correlation coefficient. Criterion validity assessed and concordance rate between PHQ-9 threshold score of $\geq$10 and the ICD-10 based diagnosis was determined with Cohen's Kappa test.	A total of 13.3% had a form of depression on psychiatric interview. A PHQ-9 score of $\geq$ 5 was ideal for screening. PHQ-9 had a good 1 month test-retest reliability (r=.875) and internal consistency (Cronbach's alpha=.835). There was high convergent validity with Beck Depression Inventory (r=.76; p=.001). PHQ-9 is a screening tool beneficial that is short and simple and easy to administer. Study shows that PHQ-9 has excellent psychometric properties as a screening tool for early detection of depressive disorders and can be effectively by pediatricians in the primary care setting.	Level II/ Good quality	**Strengths**: include evidence showing the PHQ-9 to be an excellent tool for early detection of depressive disorders. **Limitations:** low prevalence of depression in sample have limited the power and stability of the sensitivity analyses. PHQ-9 was carried out among students with English version of the questionnaires, limiting its reach. Further studies needed using available translated versions to include wider selection of adolescent students.
Article 4									

| Allgaier et al., 2012. Screening for depression in adolescents: validty of the patient health questionnaire in pediatric care. Munich, Germany | N/A | observational cohort (prospective study) | **Setting:** Six pediatric and pediatric surgery hospitals in Munich, Germnay.

Sample: 598 met inclusion criteria, complete data sets were obtained for subset of 322 of these patients.

Inclusion criteria: newly admitted in- and outpatients aged 13-16. Sufficient health, satisfactory general cognitive abilities, satisfactory German language skills for independent completion of the questionnaire. A minimum of 2 days necessary for inpatients to take part. Outpatients having an appointment in the hospital had to be accompanied by their parents.

Exclusion criteria: | IV1: PHQ-9

IV2: Gold standard interviews (interrater reliability good; Cohen's k=0.90)

IV3: Clinical diagnosis by attending pediatrician

DV: Validity of PHQ-2 and PHQ-9 as depression screener for adolescents to improve recognition rates in pediatric care. | Areas under the receiver operating characteristics curve (AUCs) and sensitivities and specificities. To determine criterion validity, diagnosis of Depressive Disorder served as the gold standard | For dimensional algorithm of PHQ-9 and PHQ-2 receiving operating characteristic (ROC) curves and their corresponding AUCs were computed. Mcnemar tests were calculated to compare sensitivities and specificities of the optimal cutoffs of the PHQ-9 dimensional algorithm and the PHQ-2 and the categorical algorithm of the PHQ-9. Statistical tests assessed at the significance level of a=.05. Bonferroni correction was implemented to account for multiple testing. Data were processed with IBM SPSS | The AUCs of the PHQ-9 (93.2%) was significantly higher than that of the PHQ-2 (87.2%). At optimal cutoffs, there was no significant difference in sensitivity (PHQ-9: 90.0%, PHQ-2: 85.0%), but in specificity (PHQ-9: 86.5%), PHQ-2: 79.4%). The unaided clinical diagnoses yielded a sensitivity of 12.5% and a specificity of 96.0%. | Level IV/Good Quality | **Strengths:** Sample covers a broad range of pediatric in- and outpatients making the results applicable to the majority of pediatric hospital patients. Another strength includes the use of a high-quality structured interview as the gold standard. Lastly, although PHQ-9 due to its better performance is the preferable instrument, the PHQ-2 along with the PHQ-9 were superior in sensitivity. Meaning that PHQ-2 may be more appropriate for implementation in busy clinical practice settings.

Limitations: Representativity of the sample may be limited since a large number of adolescents did not provide informed consent or were discharged from the hospital before completion of the study. |

			Patients who did not meet inclusion criteria and those whose parents did not sign informed consent.			Statistical version 19 and R version 2.13.0			
Article 5									
Bhatta (2018). Outcomes of Depression Screening Among Adolescents Accessing School-based Pediatric Primary Care Clinic Services.	Donabedian model for development of the screening intervention and assessment of mental health screening following PHQ-9 implementation.	Double-blind peer reviewed, QI project	**Setting:** Pediatric school-based primary care clinic in southwestern US. **Inclusion criteria:** **Exclusion criteria:**			Data analyses included descriptive statistical methods. The use of standardized depression screening protocol assisted in the identification of adolescents at risk for depression. 31.3% of adolescents screened positive for elevated depressive symptoms; 12.5% scored at or above the recommended screening cutoff of 10 for menta health referral. PHQ9 **depression screening** was identified for 56.3% (n = 144) of charts with scores ≥ 10 for 12.5% (n = 18)**among** those screened. Mental health referrals were made for 83.3% (n = 15) with PHQ-9 scores ≥ 10. Dysthymia	Level V/High Quality/ Level D	Strengths: Project provided protocol for implementation of the depression screening tool, PHQ-9, within school-based pediatric primary health clinic settings. Study resulted in improved screening and referral for depression among adolescents. Limitations: generalizability to adolescents of other ethnic and cultural backgrounds. Likewise, although the plan for follow-up was discussed with adolescents per protocol, the majority did not follow-up with primary care providers, and follow-up was not assessed in this project. Screening for the majority of adolescents occurred during visits for episodic illness which may have been a confounding source of depressive symptoms.
Article 6									
Richardson et al., (2010). Evaluation of the PHQ-9 Item for Detecting	N/A	RCT blinded study	**Setting:** Pediatric school-based primary care clinic in southwestern US.		-			Level I/High Quality/Le vel D	Strengths: associated with severe sepsis Limitations:

Major Depression Among Adolescents			**Inclusion criteria:** **Exclusion criteria:**						

Appendix B

Patient Health Questionnaire Algorithm in the Pediatric Emergency Department at YNHH

Patient ≥ 12 years old triaged and roomed

PHQ-9

- Obtained by bedside RN

Score ≤ 2= NEGATIVE

- No BH intervention

Scores 5-9

See intervention 1

Scores 10-14 but DOES NOT mark "1,2,3" to question #9

See intervention 2

Scores ≥ 15 and DOES NOT mark "1,2,3" to question #9

See intervention 3

Any PHQ score + PHQ #9

See intervention 4

Intervention 1
Scores 5-9

1. Discharge paperwork with resources for scores ≤ 9 will be provided to the patient and the family

MODERATE RISK

Intervention 2
Scores 10-14 but DOES NOT mark "1,2,3" to question #9

1. Add AVS discharge instructions on depression, teens with depression
2. Depression resources provided to print
3. Notify primary care provider upon discharge regarding findings
4. 211 resource

MODERATE SEVERE TO SEVERE

Intervention 3
Scores ≥ 15 and DOES NOT mark "1,2,3" to question #9

1. Pediatric emergency department provider to page social worker to consider consult
2. Social work to review and provide patient education for depression risk handouts to family
3. Add AVS discharge instructions on depression, teens with depression
4. Notify primary care provider upon discharge regarding findings

RISK FOR SUICIDE

Intervention 4
Any PHQ score + PHQ #9

1. Registered nurse to complete full CSSRS to determine suicide risk
2. Behavioral health patient→ safety screening, safe room after patient is medically cleared

Appendix C

Project Title: Enhancing Depression Screening for the Adolescent Population in the Pediatric

Emergency Department (PED) by Utilizing the Patient Health Questionnaire

Project Mentor: Ranbir Bains, PhD, APRN, CPNP

Doctor of Nursing Practice Project Roadmap		
Component	**Definition**	**Date Done**
Phase 1: Problem Identification and Evidence Review		
Clinical Inquiry including background and significance of problem	Describe local problem and its significance. Include data to frame local problem.	01/08/21
Organizational priority	Summarize information that supports topic/problem is an organizational priority.	01/08/21
Searchable Question	Write a focused, searchable question using an established method (e.g. PICO).	01/08/21
Evidence search	External evidence • Summarize search strategy (e.g. databases, keywords, filters/limits, criteria for article selection, tools for critical appraisal). Include practice-based evidence (e.g. evidence-based solutions that experts/other health systems have implemented to address practice problem).	01/22/21
	Internal evidence • Summarize applicable unit/community/department/hospital/organizational level data or data required for national entities (e.g. CMS, NDNQI, AHRQ).	01/22/21
	Perform needs assessment if applicable.	N/A
Evidence appraisal, summary, and recommendations	Organize evidence that answers focused clinical question in a clear concise format (e.g. table or matrix).	01/24/21
	Appraise literature for quality and applicability of evidence using established method (e.g. Johns Hopkins Nursing EBP Research Evidence Appraisal Tool, Joanna	01/27/21

	Briggs Institute Critical Appraisal Tools, Fuld Institute for EBP critical appraisal tools etc.).	
	State recommendations(s) and link to evidence strength and quality and risk/benefits.	
Phase 2: Project Planning		
Project goals	State intended, realistic outcomes of project using established method (e.g. SMART criteria).	02/02/21
Framework	Select framework/model to guide implementation (e.g. EBP model, QI framework, Change model).	2/02/21
Context	Describe project setting and participants or population, or other elements that are central to where the change will occur.	2/02/21
Key stakeholders	Identify agencies, departments, units, individuals needed to complete the project and/or affected by project, and strategies to gain buy-in.	2/02/21
Practice change/intervention	Provided detailed description of practice change or intervention (e.g. new or revised policy).	3/14/21
Evaluation	Summarize plan for evaluating the effectiveness of the practice change. Identify applicable process and outcome data to be collected/tracked and tools to do this. Identify the methods for analyzing/interpreting the data (e.g. control, run or Pareto charts).	3/14/21
Possible barriers to implementation	Identify possible barriers and implementation strategies to mitigate these barriers.	3/14/21
Sustainment	Identify strategies to sustain the change.	3/14/21
Timeline	Create a realistic timeline for project completion.	3/14/21
Resources	Identify all resources (e.g. indirect and direct) needed to complete the project.	3/14/21
Ethical merit	Identify and obtain the required review and approval needed for implementation (e.g. institution, community agency, IRB).	3/14/21
Phase 3: Implementation		
Implement project	Carry out the project using selected implementation framework/model.	07/05/21
	Track any deviations/changes from the project plan.	11/6/21
Phase 4: Evaluation		
Results/Interpretation	Using an established method (e.g. run or control charts) display data and interpret project outcomes.	11/15/21

	Report evaluation of the effectiveness of the practice change, including extent the practice change was implemented (process outcome) and extent to which the desired outcome(s) were achieved.	11/15/21
Return on investment	Identify the final resources that were used to implement the project. Calculate and report the return on investment.	Complete by 2/08/22
Phase 5: Dissemination		
Traditional	Disseminate to the project setting in a manner meaningful to them (e.g. executive report, poster, presentation at a meeting, poster with QR code to access details of project, etc.)	Complete by 3/10/22
	Disseminate in the format required by the academic institution (e.g. poster, public presentation) and	
	Prepare final project write-up using established reporting guidelines (e.g. EPQA, SQUIRE) and academic institution requirements.	
Non-traditional	Develop a website to display project, use personal or program social media (e.g. Twitter, Facebook) to share project information.	N/A

Appendix D

Question	Yes	No
1. Is the project designed to bring about immediate improvement in patient care?	X	
2. Is the purpose of the project to bring new knowledge to daily practice?	X	
3. Is the project designed to sustain the improvement?	X	
4. Is the purpose to measure the effect of a process change on delivery of care?	X	
5. Are findings specific to this hospital/setting?	X	
6. Are all patients who participate in the project expected to benefit?	X	
7. Is the intervention at least as safe as routine care?	X	
8. Will all participants receive at least usual care?	X	
9. Do you intend to gather just enough data to learn and complete the cycle?	X	
10. Do you intend to limit the time for data collection in order to accelerate the rate of improvement?	X	
11. Is the project intended to test a novel hypothesis or replicate one?		X
12. Does the project involve withholding any usual care?		X
13. Does the project involve testing interventions/practices that are not usual or standard of care?		X
14. Will any of the 18 identifiers according to the HIPAA Privacy Rule be included?		X

Appendix E

Letter of Intent

Project Overview

Date Submitted	3/5/2021
Delivery Network	Yale New Haven Hospital
Student Information	
Name and Credentials	Chelsea Alvarez, RN, BSN
• Current Position	Registered Nurse
• Current Employer	Yale New Haven Hospital
• Email Address	AlvarezC7mail.sacredheart.edu
• Telephone	(203)731-1404
• Program of Study	DNP, FNP Track
Yale New Haven Health Practice Site for Project	
Proposed Area	Pediatric Emergency Department
YNHHS Site Preceptor	Erika Setzer, MSN RN CEN CNML NE-BC
• Current Position	Patient Service Manager
• Email Address	Erika.Setzer@YNHH.org
• Telephone	(203)200-6717
Faculty Advisor	
Name and Credentials	Ranbir Bains PhD, APRN, CPNP
• School of Nursing	Sacred Heart University
• Email Address	bainsr@sacredheart.edu
• Telephone	Click here to enter text.
Method of Inquiry Determination made by NSRC (See checklists for guidance)	
Submission Type	☒ Clinical Quality Improvement (See Checklist from Yale HIC) ☐ Clinical Research (See Checklist from Yale HIC) ☐ Evidence-Based Practice Project ☐ Program Evaluation Specify: _____

Project Details

Title of Project
Enhancing Depression Screening for the Adolescent Population in the Pediatric Emergency Department by Utilizing the Patient Heath Questionnaire

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Briefly discuss the background information used to identify the clinical question or problem. Use less than 300 words.

According to the World Health Organization (2021), mental health disparities make up 16% of the global burden of disease and injury in people ages 10-19. Although half of all mental health conditions start around the ages of 14, many cases are unidentified and left untreated. Failure to address mental health disorders in children can lead to poor outcomes of health and well-being. For example, mental health disorders can lead to violence, sexual risk behaviors, academic failure, substance abuse, chronic physical diseases, and suicide (Wenhua, 2017). Ultimately, the United States Preventative Services Task Force (USPSTF) has recognized supportive evidence in identifying major depressive disorder in adolescents (12-18 years of age) by using screening tools such as the Patient Health Questionnaire (PHQ) (2016). It is essential to effectively implement mental health screening measures for this vulnerable population to identify those at risk for serious health outcomes. Nonetheless, identifying adolescents with mental illness and depression will bridge the gap in receiving appropriate treatment and resources to prevent further disparities in these patients.

Yale-New Haven Hospital (YNHH) is a non-profit, tertiary medical center that holds its own children's hospital and emergency department in New Haven, Connecticut. The pediatric emergency department (PED) alone cares for a high census of patients needing a psychiatric evaluation. These patients (12 years and older) are then screened for suicidal ideation with the Columbia Suicide Severity Rating Scale (C-SSRS), which focuses solely on suicidal ideation. In comparison, patients presenting to the PED with medical problems, injury, or trauma are not routinely screened for mental health illness, posing a risk for improper identification of patients in need of mental health care.

Describe the purpose of the proposed project using a statement or question. For example, the proposed project may aim to reduce falls with injury on a particular unit or develop best practice guidelines for reduction of surgical site infections. Use less than 150 words.

The purposes of this quality improvement project are to implement the PHQ depression screening among all patients ages 12 years and older and to provide necessary referrals for pediatric patients screening positive for depression in the pediatric emergency department.

Specific aims of this project are to:
1) Create/build an algorithm that involves decision making tools for specific scores of the PHQ.
2) Educate all nurses on the PHQ screening. Education will be provided 1:1 by the DNP student. Knowledge will be measured by a five question pre/post survey and staff RN will be signed off after education.
3) Monitor and trend staff compliance with the new practice of screening patients for depression and making referrals for patients who screen positive.
4) Provide performance feedback on compliance with depression screening and referral rates to staff in the PED.

Describe the target population and sample size, if appropriate. If related to patient populations, please note the daily or weekly volume of patients seen in the proposed area for the project. Please specify if the participants in the project are patients, nurses, other employees. Use less than 150 words.

The target population for this project are all patients ages 12 years and older presenting to the PED for medical and/or behavioral health chief complaints. Before the coronavirus pandemic, the average daily census was about 125 patients a day. Since then, for 2020 and so far for 2021, the average daily census is about 65 patients a day with about 50% of patients being 12 years and older (E. Setzer,

personal communication, March 1, 2021). This quality improvement projects anticipates reaching out to all patients in the PED ages 12 years and older which consists of about 30-35 patients daily.

The PED sees more than 32,500 children annually (Yale New Haven Health, n.d.). In the year of 2020, the PED cared for a total of 30,366 patients with our behavioral health patients making up about 10% of those patient visits.

Lastly, all nurses will be educated on the PHQ depression screening prior to new practice implementation by the DNP student. There are 49 registered nurses currently staffed in the PED. **Briefly describe the methods planned for this project. Evidence-based practice projects should be framed using an appropriate model. Quality improvement projects should use a quality improvement framework. Research projects should use research methods.**

The PHQ initiative in the Pediatric Emergency Department is a project that is preparing for operation. The DNP student will join this existing project team and will participate in certain steps of this project. This QI project will follow the Iowa Model of Evidence Based Practice Revised (Buckwalter et al., 2017) to help collect and analyze information regarding the use of the Patient Health Questionnaire in the PED.

Chelsea Alvarez, the DNP student at Sacred Heart University, is joining this existing project in the PED as part of her degree requirements. The DNP student will be responsible for:

1) Creating an algorithm for decision making in the PED based on scores obtained from the PHQ screening (Appendix A).
2) Educating all staff nurses on the PHQ depression screening based off of the Agency for Healthcare Research and Quality (AHRQ) PDF education tool (Appendix B). The DNP student will then provide pre/post surveys to the nurses to measure education and understanding of PHQ and purpose in the PED (Appendix C).
3) Collecting compliance rates of nurses providing PHQ depression screening.
4) Providing 1:1 feedback on compliance with PHQ screening to nurses.
5) Assessing barriers to screening by obtaining confidential feedback from nurses via feedback box placed in breakroom.
6) Collecting and trending positive PHQ scores.
7) Collecting and trending referral rates needed based on positive PHQ scores.
8) Providing performance results to nurses monthly via improvement huddles and staff meetings.
9) Disseminating results internally: 1- page executive project summary will be provided to the Nursing Scientific Review Committee (NSRC).
10) Disseminate results externally: Prepared project poster and presentation of project to Sacred Heart University College of Nursing.

*** No manual data collection will be necessary. A software program called "Tableau" which is built from EPIC will be used. Tableau will allow the DNP student to run EPIC reports on data collection, without having to audit individual patient charts.

Explain the data to be collected or used for this project. Please specify if these data will be actively collected from patients or other individuals; collected from medical records, event reports, or similar; collected as quality outcomes such as fall rates.
Data collection will be completed by the DNP student.

- Nursing education completion of the PHQ and created algorithm will be tracked on an attendance list and a 7 item pre/post survey
- Data regarding positive PHQ scores (3-9) will be collected through the EPIC dashboard reports via - Tableau software
- Data regarding positive PHQ scores ($\geq$10) needing SW referral will be collected through EPIC dashboard reports via Tableau software
- Nurse compliance to PHQ algorithm will be collected through the EPIC dashboard reports via Tableau software

Indicate number of months it will take to complete the project.
6-9 months

Scholarly Project Overview

Date Submitted/Revised	7/1/2021
YNHHS Delivery Network	Yale New Haven Hospital
YNHHS Scholarly Mentor's Name	Carolyn Bradley
Student Information	
Name and Credentials	Chelsea Alvarez BSN, RN
Current Position	Registered Nurse
Current Employer	Yale New Haven Hospital
Email Address	Alvarezc7@mail.sacredheart.edu
Telephone	203-731-1404
Program of Study	DNP, FNP track
Yale New Haven Health System Practice Site for Project	
Proposed Area	Pediatric Emergency Department
YNHHS Site Preceptor	Erika Setzer, MSN RN CEN CNML NE-BC
Position	Patient Service Manager
Email Address	Erika.Setzer@YNHH.org
Telephone	203-200-6717
Faculty Advisor	
Name and Credentials	Ranbir Bains PhD, APRN, CPNP
School of Nursing	Sacred Heart University
Email Address	bains@sacredheart.edu
Telephone	

Scholarly Project Details

Project Title

Enhancing Depression Screening for the Adolescent Population in the Pediatric Emergency Department (PED) by Utilizing the Patient Health Questionnaire

Purpose Statement and Goals (Maximum 75 words)

Example: Implement and evaluate an evidence-based fall prevention bundle to reduce falls with injury on a particular unit

The purpose of this quality improvement project is to implement the Patient Health Questionnaire (PHQ) depression screening for patients ages 12 years and older and to provide appropriate referrals for those that screen positive for depression in the pediatric emergency department (PED).

Project Methods: Include all of the following categories.

Participants:

Identify if nurses/other employees, patients, or combinations of people are being involved. How many of each category do you expect to involve?

The target population for this quality improvement (QI) project are all patients ages 12 years and older presenting to the PED for medical and/or behavioral health chief complaints and the nurses who work in the PED.

This QI project anticipates reaching out to about 30-35 patients daily who are 12 years and older and 49 nurses who are currently staffed in the PED.

Inclusion criteria includes: all patients presenting to the PED who are 12 years and older and all nurses working in the PED.

Exclusion criteria includes: All patients younger than 12 years old.

Describe Project Setting:

The setting is the PED at Yale New Haven Hospital in New Haven, CT. Annually, over 32,500 children are seen in the PED (Yale New Haven Health, n.d.). Before the coronavirus pandemic, about 125 patients were seen daily. Since then, the average daily census is about 65 patients a day with about 50% of patients being 12 years and older (E. Setzer, personal communication, March 1, 2021). In 2020, the PED cared for a total of 30,366 patients with behavioral health patients making up about 10% of those patient visits. The nurse-to-patient ratio is 1:3.

Theoretical Approach and/or Change Theory:

Select from options below. Identify the specific model/theory, but you <u>do not</u> need to write a description of the model or theory.

☒ EBP Model: Iowa Model of Evidence Based Practice Revised by Buckwalter et al (2017).

☐ QI Model: Click here to enter text.

☒ Change Theory: Plan, Do, Study, Act Cycle

☒ Other: Donabedian Model for measures

Interventions:

Provide detailed description of your practice change or intervention and how you plan to implement it. (Example: details of PDSA cycles). Discuss how you will ensure that the content is accurate and relevant to meeting project goals. Please attach a concise summary of your body of evidence to support the practice change or intervention (e.g. evidence table and evidence synthesis table that you are required to do for school).

Cycle 1:

Plan→ Assemble team, identify aims of project, create PICO question (See appendix A)

Do→ Appraise and synthesize evidence based on PICO question.

Study→ Formulate evidence table and evidence synthesis table that supports PHQ intervention (See Appendix B)

Act→ Review evidence and determine the need for PHQ intervention in the PED.

Cycle 2:

Plan→ Draft aim statements of the PHQ implementation in the PED

1. Improve nurse knowledge on PHQ screening prior to implementation
2. Improve PHQ screening to all patients 12 years and older presenting to the PED for medical and/or behavioral health chief complaints.
3. Improve appropriate referrals to those patients scoring positive in the PHQ screening.

Do→

1. Create/build algorithm that involves decision making tools for specific scores of the PHQ. This algorithm will describe the appropriate referrals based off each score (See Appendix C)
2. Educate nurses on the PHQ screening. Education will be provided 1:1 by the DNP student. Education will be completed via EPIC playground and with the Agency for Healthcare Research and Quality (AHRQ) PDF education tool scores that includes follow-up with patients with significant findings (See Appendix D). Knowledge will be measured by a 7-question pre/post survey and staff RN will be signed off on paper checklist after education.

Study→

1. Evaluation of pre/post surveys. Overall survey scores will be entered in excel and averaged. Averages of overall score pre and post education will be displayed on bar graph for comparison of results.

Act→

1. 100% of staff will attend a 5-10 minute training session with the DNP student. Nurses who do not complete training session, will be sent an email through their Yale New Haven Hospital email address regarding scheduling a time for 1:1 debriefing and education from DNP student.

Cycle 3:

Plan→ Pilot PHQ screening in the PED on all children ages 12 years and older based on algorithm created. The goal is for 50% of patients in the PED who meet criteria, to be screened in the first month of implementation. Goal of 50% is realistic in the PED due to the better practice advisories (BPAs) in EPIC that will be created and displayed on the patient's chart as a reminder for nurses to screen.

Do→

1. The bedside nurse assigned to the patient will provide the laminated PHQ to the patient upon being roomed in the PED.
2. Patients scoring less than 2 on PHQ-2 will not need any further intervention.
3. Patients scoring 10-14 and "no" to question 9 on the PHQ, will obtain discharge instructions on depression and teens with depression. All patients scoring 15 or greater and "no" to question 9 will have social work paged to consider consult. Any PHQ score with "yes" to question 9 will be considered "high-risk for suicide." These patients will automatically need behavioral health consult in the PED and will be care for based on current practice for mental health patients in the PED. BPAs in EPIC will be utilized to guide the provider and the nurse caring for the patient on the flow of the next steps in the ED depending on scores (See Appendix E).

Study→ Data collection and analysis

1. Data will be collected by the DNP student. Data collection will involve trending positive PHQ scores for patterns in data and referral rates based on positive scores.
2. Monitoring staff compliance with screening patients will be completed.

Act→

1. Assess success of PHQ implementation in PED. Success will be based on all nurses utilizing the PHQ questionnaire to all patients 12 years and older. Identification of positive scores in PHQ, referral rates, and percentage of nursing compliance will be evaluated as well.
2. If nursing compliance not at goal, refer back to cycle 2 of PDSA.
3. Results of the outcomes of PHQ screenings completed by the nurses will be communicated regularly to staff nurses during improvement huddles and performance boards.
4. Internal and external dissemination will occur shortly after pilot evaluation is completed. Internally, a 1-page executive project summary will be distributed to all staff members, the quality and safety team professional nursing shared governance, and the Nursing Scientific Review Committee (NSRC). Externally, a project poster will be prepared for presentation to the Dr. Susan L. Davis & Richard J. Henley College of Nursing faculty and students in April 2022. Project poster will include the title, interprofessional team members, purpose statement, rationale/background, project framework, practice change, implementation strategies, evaluation of results, conclusion, and implications for practice.

Include names of individuals from the organization who will be involved with your project and their role in the project, if applicable.

Chelsea Alvarez, the Doctor of Nursing Practice student at Sacred Heart University, is joining this existing project in the PED as part of her degree requirements. The DNP student will be responsible for the education of staff members, data collection and analysis, and the dissemination of project results. The DNP student will also be providing 1:1 debriefing with the staff nurses if compliance is not at goal of 100% screening rate. Lastly, the student role will also consist of data analysis in order to determine the next steps of project implementation.

The unit service manager, Erika Setzer, will be the practice mentor. The leadership team on the unit consists of three people: Erika Setzer, PSM; Jessica Vetter, APSM; and Elizabeth Bartone, APSM. The leadership team will create tip sheets that will be made available to nursing staff for PHQ implementation.

Ashley O'bryan, the PED educator will partner with the DNP student in formalizing staff education on the PHQ screening tool. Ashley O'bryan and the DNP student will be responsible for ensuring that all RNs are checked off in education of the tool.

The social work and child psychiatry team will ensure that the PHQ is formatted appropriately for the emergency department. The social work team will also review and monitor the PHQ tool in order to guarantee that the positive screenings are being followed-up according to the practice algorithm.

Information technology specialists (IT) and EPIC analysts will be responsible for building the PHQ into the Epic EHR Software so this tool will be accessible to all RN staffed in the PED. IT specialists will ensure that the PHQ tool aligns with all ports of entry across all Yale New Haven Health Systems.

The Quality and Safety team will be responsible for general oversight of quality improvement processes. Quality and Safety will review the processes of this project in order to ensure that the project goals are being met. Quality and Safety will also be responsible in gathering data to assess and monitor screening compliance.

If the project includes an educational intervention, how long will it take to complete? Please attach learner objectives and content outline, handouts, and PowerPoint slides

The education of nurses on the PHQ implementation will take about 5-10 minutes for each session. The goal is for education to be completed in 7 days. See Appendix D for education handouts on PHQ from the AHRQ website.

Evaluation:
Summarize your plan for evaluating the effectiveness of your scholarly project. Be sure to describe applicable structure, process, and outcomes goals. Include the following information:

Process Measures

    1. Completion of nurse education in the PED based on AHRQ PHQ handout in Appendix D.

Goal: 100% of staff will attend a 5-10 minute training session with the DNP student.

    2. Completion of patients 12 years and older screened in the PED.

Goal: 50% of patients in the PED who meet criteria, will be screened in the first month of implementation.

    3. Identification of those scoring positive for depression on the PHQ

Goal: 100% of all patients scoring positive for depression will be identified.

Outcome Measures

Aim 1: Improve nurse knowledge on PHQ screening

Aim 2: Improve PHQ screening to all patients ages 12 years and older presenting to the PED for medical and/or behavioral health chief complaints.

Aim 3: Improve appropriate referrals to those patients scoring positive in the PHQ screening

What data you will use to track the progress of your project related to these goals over time?
The following data will be tracked monthly:

1. *# of nurses educated/ # nurses in the PED*
2. *# of patients $\geq$ 12 years screened/ # of patients $\geq$ 12 years seen in ED*
3. *# of patients $\geq$12 years screened positive / # of patients $\geq$ 12 years screened with the PHQ-2*
4. *# of patients $\geq$12 years screened positive / # of patients $\geq$ 12 years screened with the PHQ-9*
5. *# of patients referred to SW / # patients screened positive on the PHQ-2 & PHQ-9*
6. *# of patients needing admission for psychiatric evaluation / # patients screened positive on PHQ-2 & PHQ-9*

Data collection plan: Specify the following:

How will these data will be collected (retrospective or prospective medical record reviews, interviews or surveys with patients or other individuals, event reports, existing quality reports, such as fall rates, local or department generated reports from EPIC).

All data will be collected retrospectively by looking back at completed screenings on EPIC dashboard via Tableau software.

The DNP student will collect data from the pre/post surveys individually and will enter overall survey scores in excel. The percentages of overall scores pre and post education will be displayed in a table for comparison of results.

Indicate if you will be collecting these data. If you are using data-driven reports, who will be providing you with these reports?

Yale New Haven Hospital Site Preceptor will provide the DNP student access to obtain and collect EPIC reports and access to the epic dashboards of the PED.

Describe how data will be recorded and attach all data collection tools.

Nursing education completion will be recorded on an attendance list and pre/post survey results. Results of surveys will remain confidential, and the nurses will be coded in excel file using identification numbers starting with 1. Nurse screening compliance will be collected through the EPIC dashboard reports via Tableau software.

Data on positive scores of PHQ-2 and PHQ-9 will be collected through EPIC dashboard reports via Tableau software.

Data on positive PHQ scores needing SW referral will be collected through EPIC dashboard reports via Tableau software.

Identify the methods for analyzing and interpreting the data (e.g. control, run or Pareto charts).

The analysis and interpretation of screening and nursing compliance data will be completed through the EPIC dashboard reports as stated above.

A run chart will be made to track monthly progress on three metrics:
% of children $\geq$ 12 years screened
% of children $\geq$ 12 years screened positive with PHQ2
% of children $\geq$ 12 years screened positive with PHQ 9
% of children $\geq$ 12 years screened positive with PHQ9 receiving consult

The analysis and interpretation of pre/post surveys will be completed by the DNP student. The percentages of overall scores pre and post education will be displayed in a table for comparison of results.

Privacy and Security of Yale New Haven Health System Data

Use of identifiable data

1.   Will you be using protected health information or HIPAA identifiers in data collection?

X No ☐ Yes

If no skip to question 2.

If yes, which of the following HIPAA identifiers or PHI would be collected? Under US law, PHI is any information about health status, provision of health care, or payment for health care that is created or collected and can be linked to a specific individual).

Use of Protected Health Information or Medical Record Access

Yes	No	Identifier
☐	☐	Name
☐	☐	All geographic subdivisions smaller than a State[1]
☐	☐	Telephone numbers
☐	☐	Fax numbers
☐	☐	E-mail addresses
☐	☐	Social Security numbers
☐	☐	Medical record numbers and/or encounter numbers
☐	☐	Health plan beneficiary numbers
☐	☐	Account numbers
☐	☐	All elements of dates (except year) for dates related to an individual, including: birth date, admission date, discharge date, date of death, all ages over 89 and all elements of dates (including year) indicative of such age, except that such ages and elements may be aggregated into a single category of age 90 or older
☐	☐	Certificate/license numbers
☐	☐	Internet Protocol (IP) address numbers
☐	☐	Biometric identifiers, including finger and voice prints
☐	☐	Full face photographic images and any comparable images
☐	☐	Any other unique identifying numbers, characteristics, or codes

[1]This includes street address, city, county, precinct, zip codes and their equivalent geocodes, except for the initial three digits of a zip code if, according to the current publicly-available data from the Bureau of the Census: (1) the geographic unit formed by combining all zip codes with the same three initial digits contains more than 20,000 people, and (2) the initial three digits of a zip code for all such geographic units containing 20,000 or fewer people is changed to 000.

2.   Will you be collecting identifiable data (names or contact information [telephone numbers, email addresses or mailing addresses]) of nurses or other healthcare professionals?

☐ No ☒ Yes

The DNP student will be collecting the names and signatures of nurses on an attendance list for education.

If no, skip to question 5

3. If yes, what methods and procedures will be used to safeguard the confidentiality and security of the identifiable project data during and after collection of these data? Include your plan for deidentifying data.

The attendance list of nurses with their signature after completing education will be locked in the manager's office. Although mandatory to complete before and after education, the pre/post surveys will be provided on paper and labeled anonymously. Each nurse will be coded in excel file using identification numbers starting with 1.

4. *Describe how, by whom, and when identifiable data will be destroyed.*

The DNP student will discard the attendance list of nurses for education in the shredder collection box on the unit once the DNP project is complete in April of 2022.

5. *Select from the options below to describe how data will be stored, and transferred within and external to the organization. Select all that apply.*

All portable devices must be encrypted if using PHI under the standards of the Yale New Haven Health System Office of Information Security and verified by the Office of Information Security at Yale New Haven Health

How will these data be transferred inside and outside of the organization?	How will the electronic/digital data be stored?
☐ Flash drive	☐ Flash drive
☐ Portable hard drive	☐ Portable hard drive
☒ Portable computer (laptop)	☒ Portable computer (laptop)
☒ Secured server	☒ Secured server
☒ Email	☒ Email
☐ On paper	☐ On paper
☐Other: Click here to enter text.	☐Other: Click here to enter text.

6. Are any of the project procedures likely to yield information subject to mandatory reporting requirements? (e.g. HIV testing – reporting of communicable diseases; parent interview -incidents of child abuse, elderly abuse, etc.). Please verify to whom such instances will need to be reported.

No

7. Who will have access to the data you are collecting (indicate student project lead, faculty advisor, site preceptor, statistician)? Distinguish between PHI and de-identified data.

The DNP student will receive data from EPIC dashboard without obtaining patient identifiers. The DNP student will be able to run EPIC reports without having to audit individual patient charts. The master checklist of nurses completing education will be locked in the manager's office. Although mandatory to complete before and after education, the pre/post surveys will be provided on paper and labeled anonymously. Each nurse will be coded in excel file using identification numbers starting with 1. No patient identifiers will be needed. The following people will have access to the de-identified data: SHU DNP student, SHU DNP project faculty advisor, and site preceptor.

8,   What will you be doing with these data (e.g. analysis plan, creating PowerPoint presentations for class, including in manuscript for publication or capstone paper)?

An abstract, poster, final project paper in manuscript format and executive summary for the practice setting is required by DNP student's academic institution. The project abstract will be provided to the NSRC as well. A project poster will be prepared for presentation to the Dr. Susan L. Davis & Richard J. Henley College of Nursing faculty and students in April 2022.The poster will include the project title, team members, purpose statement, framework, implementation strategies, results, and implications for practice.

What is the expected duration (in months) of this Scholarly Project? Approval is granted for 1 year with an opportunity for a 6 month extension.

4-8 months

Appendix F

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

NAME:_____ DATE:_____

Over the last 2 weeks, how often have you been
bothered by any of the following problems?
(use "✓" to indicate your answer)

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

Appendix G

PHQ-9 Quiz

1. **The Patient Health Questionnaire-9 (PHQ-9) Screening is intended to:**
A) Screen patients for suicidal ideation
B) Screen patients for the anxiety and obsessive-compulsive disorders
C) Screen patients for the presence and severity of depression
D) Screen patients for the severity of pain among patients with chronic illness

2. **The first two questions of the Patient Health Questionnaire (PHQ-9) focuses on:**
A) Loss of interest/pleasure in doing things and feelings of being down, depressed, or hopeless.
B) Suicide ideation and difficulty sleeping
C) Poor appetite and feeling tired
D) Trouble concentrating and feeling depressed

3. **The highest score that one can receive in the Patient Health Questionnaire (PHQ-9) is:**
A) 9
B) 15
C) 27
D) 50

4. **The Patient Health Questionnaire focuses on one's feelings over the past:**
A) Week
B) Two weeks
C) Month
D) Year

5. **Nurses are responsible for using the PHQ-9 to assess which of the following ages of patients seeking care in the pediatric emergency department regardless of chief complaint?**
A) 8-21 years old
B) <12 years old
C) 12 years and older
D) 16 years and older

6. **Nurses will be responsible for obtaining the PHQ-9 screening on which patients who present to the emergency department?**
A) Patients with a chief complaint of suicidal ideation

B) Patients with a chief complaint of anxiety

C) All patients regardless of the chief complaint

D) Only patients presenting with medical chief complaints

7. **What score on the Patient Health Questionnaire requires immediate attention for risk for suicide?**

A) Any positive score on question 9 of the PHQ

B) Total score of 1-4

C) Total score of 5-9

D) Total score $\geq$ 15 and no to question 9

Appendix H

Project Poster