

**Pediatric Behavioral Health Screening in the Primary Care Practice**

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### Abstract

Behavioral health issues affect between 15% to 20% of children, and if left untreated, these issues can lead to long-term mental and physical health issues in children and adolescents. The purpose of this quasi-experimental, evidence-based quality improvement project was to evaluate the efficacy of the Pediatric Behavioral Health Screen in identifying mental health concerns and functional ability impairments in pediatric patients between the ages of 7-18 years seen in the pediatric primary care clinic and the referral rate to mental health services for those that screen positive for concerns. The intervention and retrospective chart review was conducted over four months; between January 2022 and April 2022, there were 86 participants in each of the two cohorts, intervention and retrospective. The intervention participants were current patients that presented to the clinic for their annual well-child exam. The screening tool identified that 25.6% of patients had positive Internalizing Domains, 29.1% had positive Attention Domains, and 8.1% had positive Externalizing Domains. There were 16.3% of participants screened positive for functional impairments. While 52.3% of participants identified some level of functional impairment concern, their scores did not meet the positive screen threshold. The retrospective cohort anxiety identification rate was 22%, and the depression identification rate was 25.6%. The intervention cohort referral rate was 22.1%, an increase of 110% over the retrospective cohort. With the significant number of pediatric patients currently affected by mental health issues, early identification and referral to appropriate services will improve their long-term physical and mental health.

*Keywords:* behavioral health screening, pediatrics, mental health, primary care, Pediatric Behavioral Health Screen

### **DNP Project Proposal: Pediatric Behavioral Health Screen**

Behavioral health concerns left untreated or undertreated in pediatric patients can lead to sequelae of acute and long-term health consequences if left without adequate treatment (Berger-Jenkins et al., 2012). For this doctoral project, the terms mental and behavioral health are used interchangeably and refer to the patient's mental health; for additional definitions of terms used, see Appendix A. For those pediatric patients that seek services for their behavioral health concerns, there is often a delay of 8 to 10 years between when the behavioral health concerns are identified and when appropriate interventions are received (Njoroge et al., 2016). Primary care offices offer the greatest opportunity for identifying these concerns as pediatric patients are seen routinely for their annual well-child exams (Brino, 2020). Once identified, primary care providers can refer their pediatric patients to the appropriate mental health service for ongoing treatment and management of these concerns (Brino, 2020).

While screening for behavioral health concerns has become a standard of care in a majority of pediatric primary care offices, it is not routine practice to evaluate the impact that these concerns have on the daily functional ability of the pediatric patient (Blucker et al., 2014; Hacker et al., 2015). The effects on daily functional ability can widely vary and encompass one or more domains, from interference with participation in school to impairing the patient's ability to interact with their family and friends (Blucker et al., 2014). In addition to causing additional stress for the patient and their family, these functional impairments can also increase the negative effects of behavioral health issues (Blucker et al., 2014).

The physical and emotional cost can be high; however, there is also an economic cost to mental health issues in pediatric patients. Each hospital admission related to pediatric mental health had an average of \$16,720 in 2006 and \$20,098 in 2011, with an average stay of 7 days in

2006 and 7.2 days in 2011 (Torio et al., 2015). For children with at least one mental or behavioral health issue, hospital costs account for 84.1% of their total hospital expenditures (Torio et al., 2015). Identified early with ongoing mental health services provided, many of these issues can be successfully managed in an outpatient setting by a PCP trained in managing and treating these issues or by an outside Mental Health Provider. This would reduce the overall annual national admission rate and the cost of treating mental/behavioral health issues (Torio et al., 2015).

Approximately 40% of all pediatric patients in the United States are affected by mental health disorders (Njoroge et al., 2016). Of those, 11% of pediatric patients will have a significant level of functional impairment, and 5% of this group will have an extreme form of functional impairment (Blucker et al., 2014). According to the most recent data from the Child & Adolescent Health Management Initiative (CAHMI), 22.3% of Missouri children, 3 - 17 years old, have at least one treatable emotional, behavioral, or developmental health condition (CAHMI, 2020). There are 28.2% of Missouri children have at least two mental or behavioral health-related concerns (CAHMI, 2020). While 55.7% of Missouri children have adequate commercial or Medicaid insurance coverage to meet the needs of their mental and behavioral health concerns, only 43.4% of Missouri children receive the necessary services needed to manage their mental health concerns (CAHMI, 2020).

### **Diversity Considerations and Local Issues**

This student investigator is a Doctor of Nursing Practice, Pediatric Nurse Practitioner student at the University of Missouri-Kansas City. During two clinical rotations in an inner city pediatric primary care clinic, this project team lead encountered many patients and families that did not complete the current standard screening tool, the Pediatric Health Questionnaire-2 (PHQ-

2). Upon further discussion with the pediatric primary care providers at the clinic, this student investigator was informed that the clinic was having difficulty improving their identification of behavioral health concerns; this was due to either the families not answering truthfully or screening tool completion. A QI project was recommended to improve the clinic's screening and identification rates to determine if an alternative screening tool would improve these rates.

With the current barriers to effective screening within the clinic, improvements to the screening process were needed to adequately screen patients for these behavioral health concerns. Approximately 35.5% to 62.5% of parents with children at the pediatric clinic have concerns about physical, behavioral, and social development; this is dependent on racial backgrounds, with parents of minority children being more likely to have concerns (*2007 NSCH Disparities Snapshot RaceEthnicity*, 2007). Improving the screening process at this clinic and offering a more accurate identification benefits the patients and families. Implementation of the screening process allowed providers to immediately evaluate the impact and improve the outcome for patients and families, allowing for a referral of the patient to behavioral health services or monitoring those patients that may have some concerns that need to be monitored but do not require an immediate referral for services.

### **Problem, Purpose**

#### **Problem Statement**

With up to 40% of all pediatric patients at this primary care clinic having some form of mental health issues, early identification of these concerns is critical to limit any negative long-term psychological or physical health implications (Njoroge et al., 2016; Savageau et al., 2016). Behavioral health screenings during primary care visits offer the best opportunity for an effective behavioral health assessment (Blucker et al., 2014; Njoroge et al., 2016, p. 1). To address the

deficiencies in recognizing behavioral health issues in primary care, behavioral health screenings should be implemented into the routine care of primary care offices (*Evidence Summary: Depression in Children and Adolescents: Screening - US Preventive Services Task Force*, 2016).

The *Pediatric Behavioral Health Screen* (PBHS) is a form that includes both the validated Pediatric Symptom Checklist-17 (PSC-17) questionnaire and ten additional questions that assess the impact of concerns identified on the PSC-17 portion of the form has on daily functional ability was developed by the Oklahoma Health Care Authority (Blucker et al., 2014). The inclusion of these additional daily functional ability questions provided a more inclusive picture of the patient's current behavioral health state than the PHQ-2 form in the pediatric clinic. The PBHS also allowed for improved efficiency in screening, reducing the need for the clinic staff to follow up a positive screen on the PHQ-2 with the PHQ-9 and conversations with the clinic social worker that include similar questions to the daily functional ability questions on the PBHS tool.

### **Purpose Statement**

This project aimed to evaluate the efficacy of the PBHS use at this primary care clinic to determine if this tool improved the identification rate of behavioral health concerns and their impact on the daily functional ability of their pediatric patients and the referral rate to mental health services. The screening tool was scored and evaluated by the patients' primary care physician or nurse practitioner. These providers were given education on the background and purpose of the screening tool and education to improve their understanding of mental health in pediatric patients.

### **Facilitators, Barriers, and Sustainability**

**Facilitators.** The primary care clinic had three full-time providers (one physician and

two nurse practitioners) and two part-time providers (one nurse practitioner and one physician) in their pediatric clinic, two licensed practical nurses, and four medical assistants. The facilitators for this project were the student project leader, providers, and nurses, educating the patients and families on the project and obtaining consent for participation.

While this project required the participation of clinic staff and providers, there was a negligible economic impact due to the implementation. There are no costs associated with the utilization of the PBHS from the Oklahoma Health Care Authority, and the parent or guardian completed the screening tool during a point in the visit when other required clinic forms are being filled out.

**Barriers.** Previous experiences with mental health and differing cultural backgrounds can impact a patient and family's willingness to participate in future mental health services (Larson et al., 2013). These experiences can also negatively influence the family's participation and use of the PBHS tool (Blucker et al., 2014). For this reason, a high-volume facility is needed to obtain an adequate sample size.

The education and consent process can also become a barrier to this project. The personal views of the nursing staff and providers can impact the level and amount of engagement that the staff has during the education regarding this project. Provider engagement can also affect the project process; for example, if the providers are running behind in their daily schedule, they may not engage the family in a manner that promotes an open level of communication or willingness to participate in the project.

**Sustainability.** This project's potential feasibility depends on the level of engagement that the clinic staff has towards the project and mental health care. Any attempts to continue utilizing the screening tool to evaluate for behavioral health concerns, as identified, are also

dependent on staff engagement. The pediatric clinic staff, both nursing and providers were given education on mental and behavioral health concerns and their effect on the daily functional ability and long-term health of pediatric patients and education and background information on the screening tool. This clinic has essential behavioral health services located on-site; they place a high value on identifying and managing the mental health needs of their patients, which provides a shared mission and passion for mental health in pediatric patients.

### **Review of Evidence**

#### **Inquiry**

In pediatric patients, 7 to 18 years old (P), does the utilization of the Oklahoma Health Care Authority's Pediatric Behavioral Health Screen tool during annual well-child checks (I) compared to the parental or patient report of mental health concerns (C) affect the early identification of depression and anxiety, and the rate of referrals to mental health specialists (O) over four months (T) at a pediatric primary care office serving low-socioeconomic families (S)?

#### **Search Strategies**

The search engine utilized for the literature review for this paper was the University of Missouri-Kansas City's Health Science Library portal. PubMed, CINAHL, UMKC Health Science Library, and AHRQ: National Guideline Clearing House databases were used for these searches. The searches were conducted over two months, from January 2020 through March 2020. The keywords included in these searches included pediatric, child, adolescent, mental health screening, behavioral health screening, functional ability, and primary care.

#### **Inclusion and Exclusion Criteria**

**Inclusion criteria.** The inclusion criteria for study articles were limited to English articles published during or after 2011, studies that focused on pediatric populations, and studies

that evaluated the PSC-17 screening tool. Additionally, studies were included that compared the efficacy of multiple screening tools, evaluated mental health screening in low-socioeconomic populations, and assessed the implementation of screening tools in primary care settings. There were 31 studies out of 249 identified during the search that met the criteria; three of these were Evidence-based Practice Guidelines, three systematic reviews randomized control trials (RCT) studies (Level I), 11 RCT studies (Level II), five nonRCT studies (Level III), four cohort or case-control studies (Level IV), four systematic review-qualitative (Level V), and one qualitative study (Level VI).

**Exclusion criteria.** The exclusion criteria included non-English, published before 2011, and participants over 18 years old. Studies that included members of an adult population were also excluded. See Appendix B for the PRISMA Diagram.

### **Evidence by Themes**

During the search process for this inquiry, four sub-themes were identified from the evidence found in the studies. These sub-themes included screening tools' efficacy in primary care, PCP use evaluation, PBHS screening tool, and barriers to mental health screening and care (from families and providers). The studies identified had either one sub-theme or multiple sub-themes acknowledged in each included study.

The failure to appropriately identify and treat mental health concerns in children can lead to long-term sequelae of problematic behaviors. The screening tools allow providers to identify these concerns and adequately treat or refer the patient to an appropriate behavioral health specialist (Hourigan et al., 2015). The sequelae identified by these studies include future behavioral health issues, substance abuse, depression, anxiety, suicidal thought or ideations, sexual risk-taking, and criminal behavior (Hourigan et al., 2015). Primary care office visits

offered the greatest opportunity for quality and frequent assessments of mental and behavioral health concerns (Tynan & Woods, 2013). According to Tynan & Woods (2013), approximately 15% to 20% of school-aged children, 5 to 12 years, have mental or behavioral health issues, supporting the need for regular screening during PCP office visits (Tynan & Woods, 2013).

Tynan & Woods (2013) also suggest that many of these children are misdiagnosed and undertreated, leading to a failure to identify mental and behavioral health issues. This failure rate increases when a primary care office does not have standardized screening tools implemented during routine office visits. A standard universal screening tool was not identified during the literature search for this inquiry; the specific screening tools utilized are based on primary care providers or site preference in determining which screening tool will be used (Silver et al., 2017).

Valleley et al. (2015) completed a study of the PSC-17 to determine the screening tool's reliability when screening for mental health concerns in the pediatric population. The authors found that of those patients that completed the screening tool, 9.7% had a pre-existing behavioral health concern, a total of 13.4% of the patients had a newly identified behavioral health concern, and 29.3% had some form of action taken on this newly identified concern (Valleley et al., 2015).

### **Screening Tools' PCP Use Evaluation**

According to Gadomski et al. (2015), the inclusion of mental health screening tools in primary care visits dramatically improves the rate at which adolescent patients are willing to openly discuss mental health concerns (Gadomski et al. 2015). The authors also found that 51.4% of participants screened identified new concerns that were not thought of before the visit, and 56.8% felt encouraged to talk about concerns or issues regarding their mental health (Gadomski et al., 2015). When the patient or family raised concerns, 78.4% of providers gave

advice, 56.8% helped the patient and family develop a plan about what to do next, 21.6% made a referral to a mental health specialist, and 13.5% of providers requested a follow-up visit be scheduled to monitor the patient's progress (Gadomski et al., 2015).

The study also found that the mental health screening tool allowed the PCPs to switch the focus of the conversation to psychosocial topics and for the adolescent patient to voice concerns regarding their social and emotional development, which are topics that are more of a problem, yet harder for teen patients to discuss (Gadomski et al., 2015; Kaess et al., 2014). The screening tool enables the provider to identify the needs and priorities of parents or guardians of the younger patients and encourages patient and family concerns to be voiced during the discussion of the results of the screening tool (Gadomski et al., 2015; Murphy et al., 2016). While the utilization of the screening tool helps identify areas of concern, the discussion of the results of the screening tool allows the patients and families to reflect on issues that may not have been directly addressed by the screening tool; however, the family may consider them a concern (Gadomski et al., 2015; Kaess et al., 2014).

With this primary care clinic having had difficulty with the identification and completion rates for their current screening tool, it was crucial to implement a process that would promote compliance of the patient and the provider staff. This could be done by implementing the screening process to have little to no impact on patient flow in the clinic and not having to change the providers' daily routines. Fothergill et al. (2013) found that having the screening tool completed before the visit increased efficiency by reducing the amount of time spent completing the instrument during the visits and allowed for more time for the provider to discuss and address the concern raised (Fothergill et al. 2013). Providers had greater efficiency in scoring and reviewing the screening tools when comprehensive training was provided to providers and staff

before implementing the selected screening tool utilized by the primary care office (Novins et al., 2013).

### **PBHS Screening Tool**

The Oklahoma Healthcare Authority (OHCA) developed an additional ten screenings questions that were added to the PSC-17 screening tool to assess the daily functional ability of the pediatric patient as a result of their mental health concerns, and this combined screening tool is titled *Pediatric Behavioral Health Screen* (PBHS) (Blucker et al., 2014). The PBHS has been identified as the screening tool that would be utilized by this QI project to assess the behavioral health and functional ability of the pediatric patient population sample in the primary care clinic and determine if it would improve this clinic's behavioral health screening and identification rate.

Blucker et al. (2014) completed a reliability study of the PBHS and found that out of the 949 study participants, 47.1% of patients aged 6-9 years had a positive PBHS screen for mental health concerns, 33.6% of those 10-12 years old, and 19.3% of those 13-16 years old, with 56.8% and 43.2% of males and females, respectively, having positive screens (Blucker et al., 2014). The following functional ability domains had positive screening results, and positive results indicate concerns with the functional ability of the patient: total functional impairment, 68.3%; distress to the child, 32.1%; burden to family, 34.4%; interferes with home life, 34.0%; interferes with child's friendships, 27.0%; interferes with child's activities, 33.2%; interferes with school or learning, 50.2% (Blucker et al., 2014). For children with positive screens, 22.4% of those patients received a referral to a mental health specialist, and 16.6% received a referral for mental health services co-located within the primary care office (Blucker et al., 2014). Of those patients identified with mental health concerns, parents reported that 40.2% of those

patients had a mental health provider, and 33.6% had an individualized education plan (Blucker et al., 2014).

With the utilization of the standardized PSC-17 screening tool, providers were able to adapt to the PBHS quickly within two months of the initial implementation of the screening tool; 73.5% of the providers in the study demonstrated accuracy in scoring the screening tool of their pediatric patients (Blucker et al., 2014). With 68% of the PSC-17 portions of the PBHS receiving positive screening results in the functional impairment section, parents reported that 32% of the children appeared to be adequately coping, leaving 78% of pediatric patients suffering from some form of daily functional impairment (Blucker et al., 2014). The study findings and rates of identification in the Blucker et al. (2014) study will be used as benchmarks to determine the efficacy of this QI project in identifying concerns in the primary care clinic along with the comparison of the project findings to the retrospective chart study.

### **Barriers to Mental Health Screening and Care**

Numerous barriers were identified that could prevent children and adolescents from receiving the appropriate mental health interventions they need; these can include stigma regarding mental health, lack of financial resources, and the limited availability of qualified mental health providers (Larson et al., 2013). The shortage of available pediatric mental health care providers was identified as one of the more significant barriers to pediatric patients accessing mental health services, with only 1 in 5 children receiving appropriate mental health interventions (Van Cleve et al., 2013). This shortage of mental health providers has also created a situation where patients and families have an extended wait when looking for and needing those services (Larson et al., 2013). Larson et al. (2013) also suggest that less than half of patients and families that waited for a mental health visit to be scheduled had an average delay of

6 months or less after, and many other referrals for patients were unsuccessful in being able to schedule an appointment with a mental health provider.

It is also suggested that it is essential for providers to consider the cultural and socioeconomic barriers of the patient and family that can prevent children and adolescents from receiving appropriate assistance for their mental health issues (Larson et al., 2013). These barriers may include stigma regarding behavioral/mental health diagnoses, lack of financial resources, and the limited availability of qualified mental health providers (Lefler et al., 2012). Additionally, urban minority pediatric patients are at a high risk of not receiving adequate mental health services outside of their primary care office, despite being considered at high risk for the adverse effects of poverty, violence, and racial discrimination (Larson et al., 2013). This data supports the determination that the makeup of this clinic's patient population from a low-socioeconomic urban area places the risk level for barriers and resistance to behavioral health services as high.

With the inclusion of the mental health screening tool into the primary care visit, many barriers that patients and families may experience in seeking mental health screenings from outside mental health providers are removed (Larson et al., 2013). No matter the reasoning for the patient and family's personal beliefs toward mental health, promoting ease when they are completing the screening tool, discussing the results, and developing a treatment and management plan is necessary for encouraging compliance and a future willingness for open and honest discussion between patient and provider (Larson et al., 2013; Jonovich & Alpert-Gillis, 2014).

Larson et al. (2013) found that 52% of the study's respondents felt that they would be embarrassed if someone from outside the immediate family found out that their child needed

services from mental health providers. The authors also found that 32% believed their child's mental health problems were not at a level of intervention from a mental health provider (Larson et al., 2013). Additionally, 28% felt that their child did not need services or interventions for mental health concerns, and 26% were fearful that their child would be placed on medication to manage their mental health issues (Larson et al., 2013). There were 21% of the families felt the mental, emotional, or behavioral health issues that their child was experiencing were common in other children the same age as the patient (Larson et al., 2013).

The results of the Larson et al. (2013) study suggest that it is vital that education on the need to complete appropriate mental health screening and interventions be provided to the patient and family. This education can be provided before the visit, and completion of the screening tool can be done during visits (Larson et al., 2013). Additionally, the study authors suggest that previous familial history with mental health services can impact how patients and families approach the screening process and their willingness to participate openly and honestly (Larson et al., 2013).

To help address the shortage of appropriate mental health services, the AAP recommends that Physicians, Pediatric Nurse Practitioners, and Physician Assistants be allowed to practice to the fullest extent of their training and educated to help the pediatric patients they serve (Committee on Psychosocial Aspects of Child and Family Health and Task Force on Mental Health, 2009). To assist clinicians with improving the mental health of their patients, certifying and governing bodies of these and other disciplines have created educational resources and certification exams to enhance their knowledge and competency (Committee on Psychosocial Aspects of Child and Family Health and Task Force on Mental Health, 2009). With the limited availability of mental health care providers, increasing the number of PCPs that are trained to

manage mental health concerns in the primary care setting will allow the 32% of patients that the Blucker et al. (2014) study found as having no apparent functional impairment, to received brief or ongoing interventions by the PCP (Blucker et al., 2014). See Appendix C for the Evidence Grid.

This QI project's inclusion of the PBHS tool into the standard daily processes of the clinic's patient visits creates a process that does not impede clinic flow, and patient care or impact the length of stay during the clinic visit. With this and the additional education on the screening process for the PBHS tool to address any parent concerns with the screening process, patient families were more likely to be more willing to complete the screening tool. Consideration for barriers must always be made to ensure that the patients and families are willing to move past their hesitations and concerns to be open and honest in completing the PBHS tool. This consideration and awareness allowed the study team to prepare for pushback from parents on the reasoning behind this new screening tool and target education and reassure parents.

### **Evidence Discussion**

**Limitations & Gaps.** The topic of this inquiry is the utilization of the PBHS in pediatric primary care settings to identify behavioral health concerns and the impact that those concerns have on daily functional ability. While the Pediatric Symptom Checklist-17 (PSC-17) is utilized as a part of the PBHS to screen for behavioral health concerns, only one independent study was identified that evaluated the efficacy of the additional questions used with the screening tool (Blucker et al., 2014). While this lack of evidence does not negate the need to identify daily functional ability, it does raise questions on the efficacy of the additional questions utilized on the PBHS (Blucker et al., 2014).

The PSC-17 is a quick standard form designed to be completed by the parent (Murphy et al., 2016). Unfortunately, this tool design places the parent's ability to adequately complete the form on an open and honest line of communication between the parent and the pediatric patient (Murphy et al., 2016). If the parents do not have an open dialogue with their child, the screening tool can be ineffective in identifying potentially serious behavioral health concerns (de Voursney & Huang, 2016).

Additionally, there are no standardized questions or a range of questions to identify impairments with daily functional ability in pediatric primary care patients (Brino, 2020). Identifying these impairments to daily functional ability is vital to ensuring that the patient retains or regains functioning in school, extracurricular activities, or at work (Brino, 2020). If these critical areas of concern are identified early, the necessary mental health interventions and referrals can be implemented before long-term sequelae become apparent (Blucker et al., 2014; de Voursney & Huang, 2016).

**Discussion.** This pediatric clinic has a co-located behavioral health department that can improve the time between behavioral health concern identification and the time of the initial visit with a mental health provider. According to Burger-Jenkins (2012), the ideal primary care setting would have co-located mental health specialists or providers. The next reasonable step is to screen for mental health concerns and functional ability and refer patients at risk. With current studies limited in evidence regarding screening for functional ability and behavioral health concerns, it is vital that screening for functional ability continues to be evaluated to identify areas of concern by either the parent or the patient (Wissow et al., 2013).

With the limited information and evidence currently identified regarding standardized questions for screening for functional ability, continued studies need to be conducted to

determine the most appropriate phrasing of these questions to promote honest answers and early identification of these concerns (Wissow et al., 2013). With only 30% of pediatric patients receiving appropriate interventions for identified behavioral health concerns, unfortunately, an average of an eight to 10-year gap between initial identification and the receiving of appropriate interventions (Njoroge et al., 2016). The current literature identifies areas of concern vital for identifying patients from low-socioeconomic backgrounds who are at high risk for having mental health concerns and impairments to functional ability (Larson et al., 2013).

A study conducted by Blucker et al. (2014) is the only study identified utilizing a validated standardized behavioral health screening tool and additional questions assessing functional ability, limiting the scope of literature available to support the aim of this inquiry. However, the evidence provided in the study supported the implementation of the PBHS screening tool in the primary care clinic to improve the identification rate of behavioral health concerns. See Appendix D for the Synthesis of Evidence Table.

### **Theory**

The Health Promotion Model has been identified as the theory providing foundational support for this doctoral project. Nola Pender developed the Health Promotion Model (HPM) in 1982 (Pender, 2011). This theory is based on 14 theoretical propositions and seven major assumptions. These form the foundation of the theory, which assumes that a person must see value in the goals and outcomes to promote and adhere to behavior changes (Pender, 2011). The assumptions of this model also propose that a person's unique environment, both external and internal forces, plays a vital role in their understanding and perceptions of health-promoting behavior (Pender & Pender, 1996). Pender and Pender (2011) also suggest that in the HPM, a person can alter their environments to enhance their ability to continue these positive health

behaviors. If pediatric patients understand that behavioral health concerns can impact daily life and have long-term health consequences if left untreated, they are more likely to adhere to a plan of care that includes seeking mental health services and medication to treat their behavioral health. With the routine screening for behavioral health concerns during well-child exams, patients and their families are provided with education, and the screening results allow for ongoing reinforcement of the importance of managing these concerns early. See Appendix E for the theory diagram.

## **Methods**

### **Quality Improvement Review, Site Approval, and Ethical Issues, Funding**

**Quality Improvement Review.** With the aim of this project to improve the identification rate of behavioral health concerns of pediatric patients, the UMKC Compliance Department reviewed this Quality Improvement (QI) Project to ensure that it meets all requirements. After project met the QI requirements, no further review by the UMKC Compliance Department was needed.

**Ethical Considerations.** All ethical principles, including Autonomy, Beneficence, and Justice, were followed during this project. To ensure that the patient and family's autonomy was upheld, all prospective project participants and their families will be given all information regarding this project to ensure their informed consent should they elect to join this project. All project participants were allowed to exit the project at any time during their visit with their healthcare providers.

To promote the beneficence of this project, as mentioned previously, a control group was not utilized to ensure that all patients were eligible for any necessary mental health services to treat the identified concerns. As this project was being conducted in the patient's medical home,

their relationship with their healthcare provider allowed for ongoing management of identified mental health concerns that were in the patient's best interest after the conclusion of this project.

To ensure that the ethical principle of justice was upheld, all patients that present to the clinic for routine well-child exams between the ages of 7 to 18 were offered the option to participate in this project regardless of the background of the patient; that included, but was not limited to the type of insurance, cultural background, or socioeconomic status. The educational information regarding the project was presented during the standard check-in process to ensure that the patients did not feel coerced to participate in the project to receive the required routine medical care.

**Funding.** Through the OHCA's offering of the PBHS as a free tool on their public website and the inclusion of the intervention tool into the routine workflow of the pediatric primary care office, there was a negligible financial cost for this project and was limited to the cost of printing the intervention tool. For an estimated itemized cost table for this project, see Appendix F.

### **Setting & Participants**

Participation in this project was voluntary and offered to all patients who presented to the clinic for routine physical exams between the ages of 7 – 18 years of age, the opportunity to participate in the project. If the patients requested more information regarding the project, the trained clinic staff were able to answer all questions for the patient and their families. Patients under the age of seven were not eligible for this project due to the screening tool's stated age window for use with children seven years of age and older. As the clinic would typically refer patients over the age of 18 years to their Adult Medicine clinic, this project did not include any patient that is 18 years of age or older.

**EBP Intervention**

This EBP intervention screened all pediatric patients between the ages of 7 to 18 years of age that presented to the clinic for their routine well-child exams with the PBHS. This routine screening allowed for ongoing screening to promote the early identification of behavioral health concerns. For those patients that screened positive for mental health concerns, referrals were placed by their primary care provider for continued management through mental health services. The data collected during this project period was evaluated and compared to patients in the same age range that presented to the clinic for well-child exams through a retrospective chart review.

**EBP Protocol.** The site selected for implementing this project was a pediatric primary care clinic. The initial phase of this QI project included education for the participating staff in the clinic; this consisted of the nursing staff and providers. The education provided included background information on mental health in pediatric patients, the history of the PBHS, and the purpose of this project.

Phase two of this QI project included the active project phase of recruiting participants. This process consists of the nursing staff educating patients and their families on the project during the check-in process and notifying the providers of families that were willing to participate in the project. The student investigator, along with the nursing and provider staff, provided the necessary education and obtained informed consent. The staff gave the patient and the family the screening tool to complete. The provider then scored the screening tool when completed and provided the results to the family and patient. During this phase, the project lead conducted a retrospective chart review and determined the number of patients identified with mental health concerns and the rate of referrals to mental health services.

Phase three consisted of the steps taken during the final stage of the project; these steps

included the evaluation of the screening tool and referral rate results obtained during phase two and the results of the retrospective chart review. This phase included compiling all the data obtained into the final written paper to present the results of this project. See Appendix G for the intervention and protocol diagram.

### **Change Process**

To aid in the process of organizational change, this project utilized the Change Curve Model developed by J.D. Duck (2001). This model has five stages: stagnation, preparation, implementation, determination, and Fruition (Duck, 2001). This model identifies the cause of the stagnation or lack of change to improve screening for mental health concerns and prepares the staff and organization to implement changes to improve patient mental health outcomes. The final three stages then allow for the actual implementation of the new process, evaluation of the impact these changes have on patients and staff, and then allowing staff and patients to see the positive outcomes of the changes.

### **EBP Model**

This project utilized the Model for Evidence-Based Practice Change, the need for change, locating the best evidence, critically analyzing the evidence, designing practice change, implementing and evaluating change in practice, and integrating and maintaining the change in practice (Larrabee, 2009). This model was first developed by Mary Ann Rosswurm and June Larrabee in 1999 and then revised in 2009. This model allows for continued evaluation and reassessment of changes throughout the research process.

The assessment of the need for change identified the improvement of screening for mental health concerns and their impact on daily functional ability in pediatric patients. The synthesis of evidence phase allowed for collecting the best evidence that supports the need for

mental health screening. The remaining phases of this model allowed for the continued application of this study to evaluate the efficacy of this project and its outcomes.

### **Project Design**

This project was based on a quantitative, quasi-experimental design. While a screening tool was utilized during this project, using a numerical assignment of the questions asked. It then scores the screening tool to identify areas of concern to classify the screening as positive or negative for mental health concerns and daily functional ability in the pediatric patient. A quasi-experimental design was utilized as this project did not have randomized or control groups. The participants of this project were attending visits for a routine annual well-child check. The results of this project will be compared to a retrospective evaluation of electronic patient records for the four months prior to the implementation of this project. See Appendix H for Project Timeline Flow Graphic.

### **Validity**

**Internal Validity.** To promote a high level of internal validity, the inclusion criteria for this project was broad to allow for increased internal validity. It encompassed all patients between the ages of 7 to 18 years who presented to the clinic for their annual well-child exam. Attrition had the potential to affect internal validity. However, as this project did not require multiple visits or follow-up sessions, which decreased the rate at which patients and families decided to leave the project was decreased. A logical and well-established project protocol was developed to establish internal validity to promote consistent education to potential project participants and provider involvement.

**External Validity.** With this project's goal of improving the identification rate of behavioral health concerns in the pediatric clinic and screening this specific pediatric site sample,

this QI project has no generalizability. Any change in the behavioral health identification rate and outcome findings is specific to the pediatric clinic and its unique patient demographics.

### **Outcomes**

This project measured two outcomes; the primary outcome was the rate of identifying behavioral health concerns and their impact on functional ability in pediatric primary care patients in the primary care clinic through the Pediatric Behavioral Health Screen (PBHS). The secondary outcome measured through this project was the rate of referrals for mental health services for patients identified as having screened positive for concerns on the PBHS. With successful outcome measurement through this project, increased screening for behavioral health concerns and their impact on functional ability was performed with an increased number of primary care offices. See Appendix I for the Logic Model.

### **Measurement Instrument**

The measurement instrument utilized for this project is the Oklahoma Health Care Authority's (OHCA) Pediatric Behavioral Health Screen which incorporates the Pediatric Symptom Checklist – 17 items (PSC-17) questionnaire and ten additional questions that screen for behavioral health concerns impact on functional ability. This project lead identified only one study that evaluated the efficacy of the PBHS. However, the PSC-17 portion of the screening tool is a derivative of the widely used Pediatric Symptom Checklist – 35 items (PSC-35) questionnaire and has been through multiple studies to determine its accuracy in identifying mental health concerns (Murphy et al., 2016).

The PSC-17 is equivalent to the PSC-35 in identifying concerns in pediatric patients (Murphy et al., 2016). The screening tool evaluates for areas of concern in the following domains: anxiety, depression, Attention-Deficit/Hyperactivity Disorder, and disruptive behavior.

Additionally, the screening tool assesses patients and families for functional impairment of daily activities caused or complicated by the domains screened. Blucker et al. (2014) found that the impairment portion of the PBHS identified 68% (n=259) of the patients as screening positive for their identified mental health concerns as having some form of functional impairment in their daily activities. While the results show a significant identification rate of functional impairment, further analysis of the PBHS is needed to show the validity of the functional impairment portion of this screening tool (Blucker et al., 2014). The tool has been published by the OHCA and is available on their website to be utilized with no permission necessary. See Appendix J for the PBHS.

### **Quality of Data**

This project lead utilized G\*Power to identify the power analysis, t-tests – Correlation: Point biserial model with an a priori analysis was used. A sample size of 86 was needed for an effect size of 0.3, an alpha of 0.05, and a power of 0.8 (*G\*Power*, 2020). The measurement of change in the identification of mental health concerns and functional impairments, as well as the rate of referral to mental health services over four months, were compared to the results of a retrospective evaluation of electronic health records for a window of four months prior to the implementation of this project. The results of the Blucker et al. (2014) study were used as a benchmark to compare the results of this project. See Appendix K for the data collection template.

### **Analysis (Statistical)**

A Chi-Square was utilized to compare the retrospective and project results. This allowed for a determination if the use of the PBHS increases the identification of mental health concerns in pediatric patients. An additional Chi-Square test was utilized to determine any change in the

rate of referrals to mental health services. A Chi-Square test was used to identify demographic data, including patient age and gender. See Appendix L for the Statistical Analysis Template.

## **Results**

### **Setting & Participants**

This QI project was implemented in the pediatric clinic in Kansas City, MO, over four months, from January 2022 to April 2022. This clinic is a community non-profit clinic that provides medical, dental, and behavioral health services to a primarily low-socioeconomic patient population (Swope Health, 2021). This facility has a total patient population of 40,355, with 14% (n=2,825) experiencing homelessness and 64% (n=25,827) living below the 200% Federal Poverty Level (Swope Health, 2021). The demographic makeup of their patient population is 50% Black, 29% White, and 19% Hispanic, with the remaining 2% listed as other (Swope Health, 2021).

Participants of this project presented to clinic for annual well-child exams and were between the ages of 7 to 18 years. All patients who presented to the clinic for their well-child exams were educated on the QI Project and able to complete the screening tool. If a non-English speaking family accepted the offer to participate, an interpreter was utilized, and the questions were read to the family for them to answer.

The demographic information collected for the project participants and the retrospective chart review was limited to patient gender and patient age in years. There were 86 project participants who completed the intervention tool and 86 patients randomly selected for the retrospective chart review. Male participants (n=52) were 60.5% of the total project group participants, and female participants (n=34) consisted of 39.5%.

### **Interventions Course, Actual**

The intervention utilized for this QI project was the *Pediatric Behavioral Health Screen* published by the Oklahoma Health Care Authority and is freely available on their website. For patients and families that agreed to participate, the intervention screening tool was used alongside the current screening tool utilized by the clinic, the Pediatric Health Questionnaire-2 (PHQ-2), a questionnaire that consists of two questions to assess patients for major depression.

The initial plan for this QI project was for approval from the faculty and facility by August 2021, with the University of Missouri-Kansas City Institutional Review Board (IRB) review of the project by the end of August 2021. However, due to an increase in the number of COVID-related patients that presented to the clinic for care, this project did not receive the facility review and approval until the beginning of December 2021 and IRB review until the middle of December 2021. Coordination and planning on introducing the project intervention into the clinic's workflow took place during mid-January 2022, with implementation at the end of January 2022. The initial project preceptor left the clinic, and a new project preceptor accepted the role and responsibilities. See Appendix M for the UMKC Faculty DNP Project Proposal Approval Letter. See Appendix N for the UMKC IRB Approval Letter.

The number of patients willing to participate was limited during the first six weeks of the project, with approximately 26 patients and families completing the intervention tool during that time. From the beginning to the end of March 2022, an additional 40 patients and families completed the intervention tool. Between the end of March 2022 and the middle of April 2022, an additional 20 patients and families completed the intervention tool, meeting the participant group goal. The retrospective chart review for 86 patients was conducted between February 2022 and mid-April 2022.

### **Outcome Data by Sub-Topic**

The results of the intervention tool was divided into two sections; the first section includes the four domains that screen for behavioral health concerns, these domains include internalizing, attention, and externalizing symptoms, and then the overall total screen score. The second section consists of the screening results for the functional impairment assessment and the referral status of the participant to behavioral health services based on the results of the intervention tool. The threshold for screening positive within the three domains is domain-specific; to screen positive for internalizing symptoms, a patient must have a score of five (5) or higher, for attention a score of seven (7) or higher, for externalizing a score of seven (7) or higher, and for the total score a total of 15 or higher. The functional impairment section had a positive screen threshold for two (2) or higher.

#### ***Behavioral Health Concerns and Impact on Functional Ability***

Of patients that presented to the clinic for well-child exams that completed the intervention tool, 25.6% (n=22) had some form of behavioral health concern, 27% (n=6) were female, and 63% (n=15) were male. See Table O1. For the overall total score for the PSC-17 portion, 17.4% (n=15) of patients screened positive, 67% (n=10) were males, and 33% (n=5) were females. See Table O4. For all patients who completed the intervention tool, 16.3% (14) screened positive for functional impairment related to behavioral health concerns identified in the first portion of the tool. See Table O9,

For internalizing symptoms, 20.9% (n=18) screened positive for concerns within the internalizing domain, 72% n=13 were males and 28% (n=5) were female patients. See Table O5. For patients that screened positive for the externalizing domain, 8.1% (n=7) had positive screens, 29% (n=2) were female, and 71% (n=5) were male. See Table O7. The attention domain had 29.1% positive screens, 32% (n=8) were female, and 68% (n=17) were male patients. See Table

O6.

The functional impairment section identified 16.3% (n=14) of the patients screened as having behavioral health concerns that impact the daily functional ability of the patient and family. Of this total, 57% (n=8) were male patients, and the remaining 43% (n=6) were female patients. See Table O4. While 16.3% (n=4) patients met the threshold for positive functional impairment, 52.3% (n=45) of the patient screened identified some form of functional impairment concern, 66.7% (n=30) were male and 33.3% (n=15) were female. See Table O8.

### ***Referrals for behavioral health services***

The overall referral rate for the intervention cohort was 24.4% (n=21), 90% (n=19) were for internal or co-located behavioral health services, and 10% (n=2) were for externally located services. See Table O11. For internal/co-located referrals, 22.1% (n=19) of the patients that completed the screening tools were referred for services, 7% (n=6) were female patients and 68% (n=13) were male. See Table O12. There were 100% (n=2) of referrals externally located, and no male patients were referred for external services. See Table O12.

Of the 86 patients included in the retrospective chart review, 24.4% (n=21) identified concerns with anxiety, 38% (n=8) were male patients, and 62% (n=13) female patients identified concerns during their well-child exam visit. See Table O13. For the depression screening, 25.6% (n=22) of the patients reviewed identified concerns, 45% (n=10) were male and 55% (n=12) were female. See Table O13. Of those patients that identified concerns, 10.5 % (n=9) were referred to co-located service, 45% (n=4) were female and 55% (n=5) were male patients. See Table O14. Of the patients referred to externally located behavioral health services, 100% (n=1) were female, and no male patients were referred to external services. See Table O14.

### ***Statistical Analysis, Chi-Square***

The statistical analysis for this project was a chi-square test. For Positive Concerns to referrals, the Pearson Chi-Square was: Value: 24.959, Df: 2, Asymptomatic Significance: <.001. There results for Internalizing to Referrals were: Value: 22.084, Df: 2, Asymptomatic Significance: <.001. For Externalizing to Referrals, there was: Value: 10.801, Df: 2, Asymptomatic Significance: .005. For the Attention to Referrals, there was: Value: 10.674, Df: 2, Asymptomatic Significance: .005. For Functional Impairment to Referrals, the statistics were: Value: 20.033, Df: 2, Asymptomatic Significance: <.001. See Table O15.

## **Discussion**

### **Successes, Most Important**

The statistical analysis found that the intervention tool is just as effective in identifying behavioral health concerns when compared to the PHQ-2 and PHQ-9, which are currently the standard screening tools in use by the clinic. With the observed effectiveness of the intervention tool, there is a potential to reduce the need for patients and families to complete up to three separate screening tools to one tool that screens for all of the concerns that the three individual forms do. Additionally, there was a 110% increase in referrals to behavioral health services from the intervention tool cohort (n=21) compared to the retrospective chart review cohort (n=10). The ability of the screening tool to quantify the level of functional impairment allowed providers to report to the behavioral health specialists when patients had more severe impairments, which potentially reduced the wait time for the first appointment.

### **Study Strengths**

With the delayed start experienced during this QI project, a limited window was available for the project intervention completion. During this decreased timeframe, the clinic staff's buy-in to the project increased. All nursing and provider staff increased the education provided to their

patients on the project and the intervention tool, increasing the number of project participants willing to participate and complete the tool. This active provider support remained consistent from the beginning of this QI project to the end, and this support aided in the success of this to meet the total project participant goal.

The project buy-in from the provider staff allowed for better acceptance of the positive score results of the behavioral health section of the intervention tool and the functional impairment section. The clinic was also excited to receive the project's final results to determine where they could improve their screening process and potentially include all or portions of the intervention tool. The project student leader presented the final results of the participants and retrospective review cohorts to the clinic administration, provider staff, and nursing staff.

With the patient population at this pediatric clinic, encountering a large number of patients unwilling to participate in the QI project was high, as this patient population can be hesitant to participate in QI or research projects. With the high level of buy-in from clinic staff for this project, the project was promoted to all patients that met the eligibility requirements. Executive-level leadership played a vital role in the approval process at the clinic and during the implementation of this QI project.

The overall organizational culture of the clinic and organization is to improve the patients' health and well-being and the community they serve. This shared value increased the project buy-in from clinic staff which promoted the project goal of improving the behavioral health screening and referral to appropriate services for this at-risk patient population. Successful implementation of this project was an effort by multiple parties and consisted of the project team, clinic staff, and leadership.

### **Results compared to Evidence in the Literature**

This project's intervention tool has one previous study, Blucker et al. (2014), that evaluated its effectiveness in screening for behavioral health concerns and their impact on functional ability. While that study was conducted on a different patient population and had a more significant number of participants, the percentages reported in the study can be used as guidelines for this project; this will allow this project to have a baseline against which the final results can be evaluated.

For patients with positive functional impairment scores, 16.3% (n=14) of this project's intervention group and 18.3 % (n=177) of the Blucker study had positive scores in at least one of the functional impairment items. The overall PBHS identification scores for this project were 29% (n=25) had concerns in at least one of the domains and 26.7% (n=259) of the Blucker study. While the total number of participants in these two studies may appear significantly different, the identification rate is nearly identical.

The internalizing domain also has a significantly similar identification rate, this project had 20.9% (n=18) positive scores, and the Blucker study had 20.1% (n=52). The number of participants in the externalizing domain has a statistical difference, this project has 8.1% (n=7) of the intervention cohort with positive scores, and 20.5% (n=53) of the Blucker study had positive scores. The attention domain had 29.1% (n=25) positive screens, and the Blucker study had 18.5% (n=48); this represents a statistical difference between the two groups.

The referral rates for this project and the Blucker study were; 24.4% (n=21) for this project's participants that had referrals to behavioral health services and 10.4% (n=101) of the Blucker study that had a referral placed. This study identified 22% (n=19) of the participants that had internal referrals using the PBHS tool and 6% (n=58) for the Blucker study. A smaller number of study participants, 2.3% (n=2), were referred for external behavioral health services

and 4.4% (n=43) in the Blucker study. The overall referral and internal referral rates for this project were both significantly higher when compared to the Blucker study.

### **Limitations**

#### **Internal Validity Effects**

Complete understanding of the questions on the screening tool by the patient and family was vital to successful answering and completion of the intervention tool. Patient and family views towards behavioral health issues might have also impacted the answers on the screening tool if the family had negative opinions of behavioral health concerns, treatment, and management. These views can be based on previous experiences with behavioral health issues or based on the cultural background of the patient and family.

Additionally, for the non-English speaking families that required the services of an interpreter, the questions may not have been fully understood by the language interpreter and not relayed correctly to the family, changing their answers. This language barrier should be considered when evaluating confounding factors and imprecision in the intervention process.

Cultural views and beliefs could have also played a role in how the patient and family answered the questions, and these views could play a significant role in whether the questions were answered honestly or if the family would seek services if the screen returned positive results. They could have also played a role in whether or not the family was accepting the recommendations for referrals to behavioral health services for positive screens.

#### **External Validity Effects**

The unique characteristics of the patient population at this clinic make the generalizability of the intervention results to other patient populations difficult. These factors include socioeconomic status, cultural background of the families, language barriers, and

availability of behavioral health services. Additionally, the characteristics of the clinic staff and their views towards the QI project and screening for behavioral health concerns are factors that are specific to this project and the facility. Co-located behavioral health services are another factor that benefited this project. Not all primary care clinics or facilities will have behavioral health services on-site and available for immediate referral, and they will be required to refer patients to outside facilities that may have prolonged wait times for new patient appointments.

### **Sustainability of Effects and Plans to Maintain Effects**

The sustainability of utilization of this intervention tool in the clinic is contingent on the value that the clinic sees in the future use of the tool in the clinic workflow. Continued clinic staff buy-in may diminish over time and can decrease the level of involvement that the staff has in helping patients and families complete the screening tool. Ongoing educational opportunities for clinic staff and ongoing discussion of recent overall results of the screening tools will promote ongoing buy-in and sustain the level of involvement that clinic staff has in educating families on the importance of behavioral health screening and encourage staff helping patients and families complete the screening tool.

To maintain the increased identification of concerns that require referrals to behavioral health services, the facility and clinic will consider incorporating the functional impairment screening portion of the tool into their daily workflow to improve the identification and recognition of behavioral health concerns. However, this will not be an immediate process change and will need to be further evaluated and considered before it can potentially be included in the routine screening for behavioral health concerns.

### **Sustainability to Minimize the Study Limitations**

Effective education for patients and families on the need to honestly answer the screening tool questions and how they can impact receiving the necessary treatment and management of identified concerns. Providing education that still respects the patient and family's view towards behavioral health can promote an open line of communication between the provider and patient and family. Education that respects the behavioral views of the family can facilitate open communication when concerns do arise in the patient. Additionally, an appropriately translated screening tool would help reduce the misunderstanding that non-English speaking families can encounter.

### **Interpretations**

#### **Expected & Actual Outcomes**

The expected outcome of the intervention tool was that the clinic would see the same or an increased identification rate of behavioral health concerns and an increase in referrals to behavioral health services compared to the method of screening utilized by the facility before the implementation of the project. It was also expected to increase the number of referrals to behavioral health services, both internal and external services. There were no established goals for the functional impairment portion of the screening tool. The project's goal was to evaluate the tool to determine the efficacy of the screening for functional impairment.

The observed outcomes for this project met the expected outcomes; the PBHS's PSC-17 portion had an identification rate similar to the identification rate of the PHQ-2 and PHQ-9 screening tools in use in the clinic. The referral rates also increased by 110% compared to the retrospective chart review; while an increase was expected, this significant increase was not anticipated. This increase may be due to the tool being an effective instrument to screen for

concerns or an isolated increase. This tool should continue to be evaluated to determine if the referral rate for the intervention group of this project was an outlier and a maintainable increase.

### **Intervention Effectiveness**

One of the benefits of utilizing the PBHS tool for screening patients for behavioral health concerns is that the tool is one page. Reducing the number of individual papers that a family has to fill out will promote the successful completion of the forms provided. Additionally, having the functional impairment questions on the same page as the PSC-17 questions allows the family to recognize impairment concerns quickly and if the patient or family is experiencing any of the impairments listed in the behavioral health questions they answered. The enthusiasm of the clinic staff and providers for this project showed and helped families understand the benefits of completing the screening tool and identifying any concerns, if present.

Sites with the highest probability of successfully implementing this study intervention are facilities based in an urban setting with a patient population that is primarily from a low-socioeconomic background and have staff with a high level of buy-in on improving the identification of behavioral health concerns.

### **Intervention Revision**

Increasing the timeframe window for implementation of the intervention tool is essential for allowing clinic staff to maintain the level of buy-in and educating families who will aid in the successful completion of the intervention tool. The level of support from the clinic providers and staff is essential to promoting patients and families to accurately and honestly report behavioral health and functional impairment concerns. Additionally, to ensure that non-English speaking families fully understand the questions being asked and can accurately report concerns, the intervention tool would be beneficial to have translated into multiple languages.

### **Expected and Actual Impact to Health System, Costs, and Policy**

The expected impact on the facility for continued implementation of the intervention tool is limited; this is due to the facility currently implementing a screening tool into the clinic workflow and currently referring patients to co-located behavioral health services when appropriate. The actual impact of the intervention tool on the facility is as expected, with no effect on the workflow of clinic staff or patients with the inclusion of the intervention tool and no impact on the actual process of referring patients to behavioral health services when concerns were identified, and treatment was recommended to the patient and family.

The financial impact of implementing this intervention was limited to printing the intervention tool, which will be paid for by the project's student leader. The facility is not expected to experience any financial impact during the implementation of this project. The actual cost of implementing the intervention was limited to the printing of the intervention tool, which was \$56 for the ink and paper to print the intervention tools and was paid for by the project student leader; no additional costs were encountered. The facility did not experience any direct costs associated with implementing this intervention for this QI project.

Future costs for the facility will be limited to printing the screening tool, which will have a limited financial impact as the clinic prints other current screening tools. The economic impact encountered by the patient and family will not change from the costs associated with clinic visits before implementing the intervention tool. Financial costs experienced by the family for referrals to behavioral health services will not vary from those costs before implementing the intervention tool and will be covered by most healthcare insurance policies.

### **Conclusions**

#### **Practical Usefulness of Intervention**

Through the utilization of the PBHS and its inclusion into the established processes in the clinic, the impact on clinic resources was limited and provided for a smooth transition from a theoretical concept to real-world application of the PBHS in this specific clinic setting. The PBHS also allowed providers to include a report of the functional impairment with the referral to the behavioral health services, which decreased the time waiting for the first available appointment. The screening tool also allowed providers to have a hard copy of the screening tool to review with the family, which the current digital questionnaire does not permit.

### **Further Study of Intervention**

Further evaluation of the PBHS is possible through the continued support of the clinic and staff. It will have a minimal financial impact on the organization as the screening tool is freely available and will not need additional services in its implementation in the clinic. Continued evaluation is ideal as it will allow for the long-term evaluation of the mental health management of the patients with identified mental health concerns and allow for the rescreening of these patients with the PBHS to determine if there is a positive or negative change in the functional ability.

### **Dissemination**

The dissemination of the results and findings of this project was done by submitting the project manuscript to the National Association of Pediatric Nurse Practitioners' *Journal of Pediatric Health Care* to be considered for publication. This project was presented at the National Nurse Practitioner Symposium in July 2022. The DNP Project Scholarly Paper was submitted to the University of Missouri Repository. Additionally, the data and findings of the project were presented to the clinic administration and staff after completing the project.



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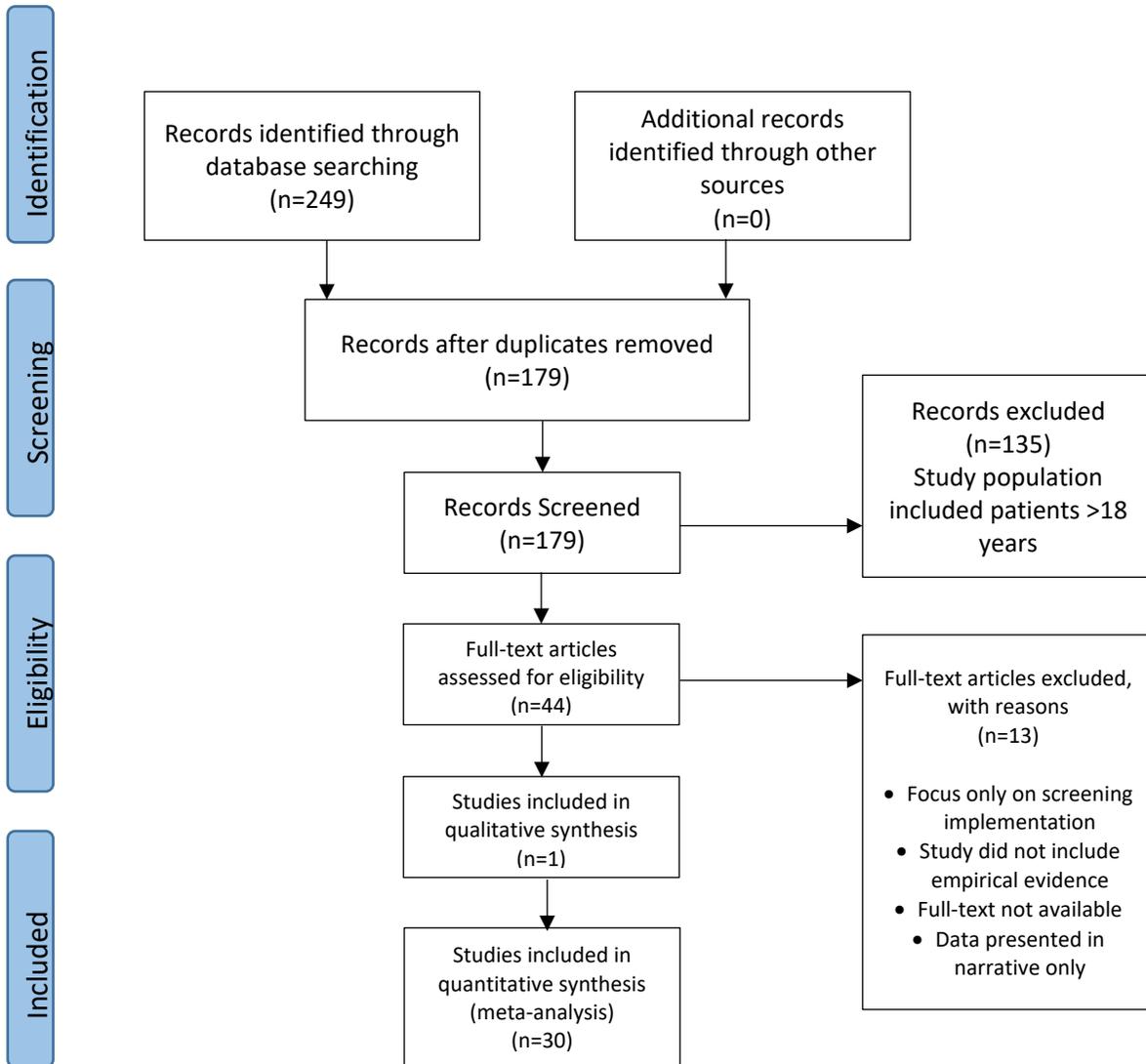
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### Appendix A: Definition of Terms (5)

- **Behavioral Health Concerns:** health issues that are related to the mental health of the patient; these include, but are not limited to, depression, anxiety, suicidal ideation, attention deficit disorder, oppositional defiance disorder, etc.
- **Daily Functional Ability:** the ability of the patient to perform and maintain daily activities; these include interactions between the patient and family members/friends/teachers, the participation in school/team sports/hobbies, and the ability to participate during the day with/without the use of illicit drugs or alcohol.
- **Mental Health Concerns:** see behavioral health concerns for the definition of this term
- **Mental Health Services:** services from mental health providers or specialists that focus on treating and managing the mental health of a patient; these include but are not limited to therapy, counseling, medication, etc.
- **Pediatric Behavioral Health Screen:** this is the screening tool that is utilized to evaluate the behavioral health of the pediatric patient; this screening tool was developed by the Oklahoma Health Care Authority and contained both the Pediatric Symptom Checklist-17 Question screening tool and an additional ten questions to evaluate the level of impact that these behavioral health concerns have on the daily functional ability of the patient.
- **Well-Child Exams:** the annual exam of pediatric patients that evaluates the patients' physical and developmental status.

**Appendix B: PRISMA Diagram**



**Appendix C: Evidence Grid**

	<b>Providers Barriers, screening barriers encountered by PCP</b>	<b>Family Barriers, screening barriers encountered by family</b>	<b>BH screening efficacy, Efficacy of screening for BH in peds pts.</b>	<b>PBHS evaluation, Evaluation of the Pediatric Behavioral Health Screening tool</b>	<b>PCP BH screening, Evaluation of PCP BH screening in primary care</b>
<b>Article (last name of first author, date)</b>					
Murphy (2016)			X		
U.S. Preventative Task Force (2016)			X		
National Collaborating Centre for Mental Health (2015)					X
Blucker (2014)				X	
Gadomski (2014)					X
Jonovich (2014)	X				
Lefler (2014)			X		
Fothergill (2013)					X
Kaess (2013)			X		
Larson (2013)	X	X			
Wissow (2013)					X
Berger-Jenkins (2012)		X			X
Tsang (2011)			X		
Savageau (2016)			X		
Hacker (2015)					X
Njoroge (2016)					X
Gardner (2007)			X		
Novins (2013)			X		X
De Voursney (2016)	X				X
Brino (2019)	X	X			
Brown (2010)	X				
Valleley (2015)	X				X
Tynan (2013)	X	X	X		
Silver (2017)	X		X		
Hourigan (2015)	X	X			

**Appendix D: Synthesis of Evidence Table**

<b>Evidence Table</b>					
<b>Inquiry:</b> In pediatric patients, 7 to 18 years old (P), does the utilization of the Oklahoma Health Care Authority’s Pediatric Behavioral Health Screen tool during annual well-child checks (I) compared to parental and/or patient report of mental health concerns (C) effect the early identification of mental health issues and rate of referrals to mental health specialists (O) over a 6-month period (T) at a pediatric primary care office serving low-socioeconomic families (S)?					
<b>First author, year, title, Journal</b>	<b>Research Design, Evidence Level, Methods</b>	<b>Sample &amp; Sampling</b>	<b>Outcomes Measured &amp; Tool Reliability (if applies and reported)</b>	<b>Results &amp; Analysis</b>	<b>Validity Concerns</b>
Gadomski (2014), Integrating Mental Health Into Adolescent Annual Visits: Impact of Previsit Comprehensive Screening on Within-Visit Process, Journal of Adolescent Health	Quantitative, Quasi-Experimental, Level III Controlled trial without randomization. This study compared two study groups in which the provider/doctor acted as their own control. The surveys were implemented during routine annual visits to evaluate the effectiveness of the DartScreen in evaluating provider-patient communication over mental health issues in adolescents.	N=72 adolescents Control Group n=37 Study Group n=35 Convenience	The outcomes measured for this study included the effectiveness of discussing the results of the DartScreen between the provider and the patient, self-report.  The authors noted no validation tool.	No statistical difference between the control group and the study group. A marginal increase was noted (study: mean 18.4 vs control: 10.6), for doctor/patient discussion of psychosocial issues.	Small sample size and non-randomization may not be representative of the target population.
Blucker (2014), Pediatric Behavioral Health Screening in Primary Care: A Preliminary Analysis of Pediatric Symptom Checklist-17 With Functional	Quantitative, quasi-experimental, Level III, This study consisted of two parts, the initial period had participants complete the Pediatric Behavioral	983 parent reports of children and adolescents, with 969 of those successfully completed the PBHS.	Outcomes Measured: (1) The PBHS results, positive or negative; (2) 6 questions/results to assess functional impairment; (3) questions/results to assess concerns for	Out of the n=969 successfully completed PBHS tools, n=259 had positive results, 56.8% (n=147) were male, and 43.2% (n=112) were female. 40.2% (n=104)	The results of this study may not be generalizable to the general population due to sample size. Large sample size. Analysis of

<p>Impairment Items, Clinical Pediatrics LL</p>	<p>Health Screening (PBHS) during annual physical exams (WCC), and the second period was a retrospective chart review and data abstraction to evaluate the accuracy of provider implementation of the PBHS.</p>	<p>Convenience.</p>	<p>substance abuse; (4) Provider interventions for positive PBHS, functional impairment, and/or substance abuse concerns.</p> <p>Self-report and record reviews</p>	<p>had a Mental Health Provider(MHP), 22.4% (n=58) had referrals made to an outside MHP, 16.6 (n=43) had in-house MHP referrals made.</p> <p>The research team states that although the positive result of the PBHS does not necessarily indicate a diagnosis, at least 25% of the patients seen for WCCs merited mental health follow-up regarding their mental health concerns.</p> <p>68% (n=176) of positive PBHS tools have received an endorsement of functional impairment on their additional questions, suggesting that these mental health concerns were having a negative impact on the child and/or family, while the remaining 32% appeared to be adequately coping.</p>	<p>socioeconomic status, ethnicity, or insurance status was completed. This study was limited to parent report and completion of the PBHS, child/adolescent reports were not taken.</p>
<p>Wisow (2013), Universal Mental Health Screening in Pediatric Primary Care: A Systematic Review JOURNAL OF THE AMERICAN ACADEMY OF CHILD &amp; ADOLESCENT PSYCHIATRY</p>	<p>Quantitative. Systematic Review, Level III</p> <p>Publication search through PubMed, PsycInfo, and EMBASE for universal health screenings used in primary care in developed countries. Search terms included: mental health, children,</p>	<p>45 studies were included in this systematic review. The research team identified the studies as being completed in the following settings: Primary care (25), Emergency Departments (6), School-based (2),</p>	<p>This systematic review was used to identify how involved families and patients were in mental health screening programs in primary care, and how those providers evaluate and use the information identified in the screenings.</p> <p>Publication Review</p>	<p>13 studies reported being introduced prior to the visit by administrative staff/front desk personnel, seven reported that these screenings were given to families by nurses or specially trained aides, and one by prompts given to primary care providers by the electronic medical record system. 20 of the</p>	<p>The non-universal approach to screening tool administration and referral process limited the ability of the research team to identify specific criteria for effective screening and referrals. In addition, the broad</p>

	<p>primary care, and screening, and included the logic term ‘AND’. A research librarian and expert in systematic reviews were consulted in the selection of the databases and the development of the search terms.</p>	<p>other ambulatory sites (2), foster care (1), state data (1). 36 of the studies utilized a single screening program, 11 of those were parent completed screenings, 22 were completed by the pediatric patient, 3 were completed by either parent or patient (depending on age). Convenience The individual studies had varying study length periods. The SR consisted of studies that were found during searches that ranged from 1976-2012.</p>	<p>The SR reliability tool and score were not identified or reported by the research team.</p>	<p>studies had the screening tools scored during the visit by computer, research assistant, or co-located mental health provider, one study was scored after the visit by the provider. Another study did not have the screening tool scored but only required that positive items from the screening assessed. Referral rates varied among sites and were determined by differing factors at the individual sites.</p>	<p>term ‘children’ does not allow for age-specific considerations to be taken in the screening and/or referral process.</p>
<p>Berger-Jenkins (2012), Effect of Routine Mental Health Screening in a Low-Resource Pediatric Primary Care Population, Clinical Pediatrics</p>	<p>Quantitative, quasi-experimental, Level III. This study was completed in a single location, with English and Spanish versions of the Pediatric Checklist-17 (PSC-17) were given to all parents of 5 to 12-year olds attending well visits. Additionally, a prescreening</p>	<p>N=114 surveillance tools were completed  N=94 PSC-17 tools were completed  Convenience (one location, with all well visits that met criteria being</p>	<p>Outcomes Measured: (1) Identification of mental health issues at visit, (2) Management of mental health issues at the visit, (3) Burden/Impact of referral service. Self-Report, record review for management, and referral service impact.</p>	<p>Parental disclosure increased: Prior to study-6.1%, during screening 19.1%. Work up for mental health issues initiated by provider increased: prior to study-7.4%, during study-31.2%. Diagnoses documented by provider decreased: prior to study-</p>	<p>The results of this study are not generalizable to primary care and community settings due to the research staff being present for participant recruitment, and to discuss possible participant compensation.</p>

	surveillance question was given to the parents, asking if they had concerns regarding their child's behavior, mood, or learning.	given the surveillance and PSC-17 tools.		81.5%, during study-71.9%. Patient adherence with mental health referral increased during the study period, 83.3%, with 40.0% adhering prior to the study. The research team states that children seen after the study implementation were more likely to have disclosure of mental health problems than their counterparts.	
Larson (2013), Barriers to Mental Health Care for Urban, Lower Income Families Referred from Pediatric Primary Care Administration and Policy in Mental Health and Mental Health Services Research	Quantitative, Level IV, cross-sectional. No experimental intervention. Parents completed a survey regarding care and personal beliefs regarding that care. Following the completion of the survey, the research team completed a record review to collect information regarding mental health services received in the clinic.	55 families enrolled in the study.  Convenience	Survey Results, record review regarding follow-up on mental health services, and barriers to seeking/receiving mental health services.  Self-Report and Record Review  Cronbach alpha > 0.7	N=35 followed-up with their mental health referral, n=16 did not attend the initial evaluation, and n=4 did not schedule the initial evaluation. Reasons for referrals: Concerns about mood (n=27); anxiety (n=3); ADHD (n=18); conduct problems (n=7); stressful life problems (n=4); substance abuse problems (n=1); while stigma was listed as a concern, the research team did not list statistical information regarding that topic. 56% of the referrals had greater than one reason for referral.	Due to the limited sample size, this study is limited.
National Collaborating Centre for Mental Health (2015), Depression in children and young:	Qualitative, Systematic Review, Level IV-Systematic Review of experimental	Review Question 1: 40 unique studies	Major Outcomes Considered: Level of function (functional status); improvement in	There were numerous recommendations, some of them include: information should be	The research team did not specify a time frame for the publication of the

<p>identification and management in primary, community and secondary care</p>	<p>and non-experimental studies</p> <p>Publication search carried out on July 8, July 21, and August 12, 2014, through CDSR; Database of Abstracts of Reviews of Effects; HTA database; DENTRAL; MEDLINE; MEDLINE In-Process; EMBASE; PsychINFO; CINHAL; NHS Economic Evaluation Database; and Health Economic Database-HEED</p>	<p>Review Question 2: 1 Systematic Review</p> <p>Review Question 3: 2 unique studies (3 articles)</p> <p>Convenience</p>	<p>depressive symptoms; remission from depressive disorder/symptoms; suicidal-related outcomes (suicidal ideation/serious adverse events); acceptability of treatment (dropout rate)</p>	<p>provided to the patient and families by the healthcare professional involved in detection assessment, or treatment of the depression in the child/adolescent; providers should take time to build a supportive and collaborative relationship with the patient and family; engage the child/parent in treatment decisions by taking expectation into account; inform patient/family of self-help groups and encourage participation when appropriate; consider language/ethnicity/cultural barriers when discussing and planning care; coordinate/organize the availability of local services; consider social network support when planning treatment options</p>	<p>studies. Without the information regarding the publication dates, it is not known the current validity of the studies included.</p>
<p>Lefler (2014), Psychometric Properties of a Primary Care Mental Health Screening Tool for Young Children, Children’s Health Care</p>	<p>Quantitative, Quasi-Experimental, Level 3, one group, and no control. This study recruited participants through three ways: word of mouth, flyers posted in various community locations, and letters sent to participants of</p>	<p>N=58 parent-child dyads.</p>	<p>The validity of the PCMHS tool was compared to that of seven standardized tests that evaluate intelligence, achievement, behavioral assessment; self-report/interviewer-administered.</p>	<p>The results show that the PCMHS tool has valid psychometric results compared to the Pediatric Symptom Checklist. The use of results of the PCMHS are adequate, however, the research team notes that additional research is needed.</p>	<p>Sample is not indicative of the general population, as 92% of the sample of European American, and 50% of participants were from higher socioeconomic families making more than</p>

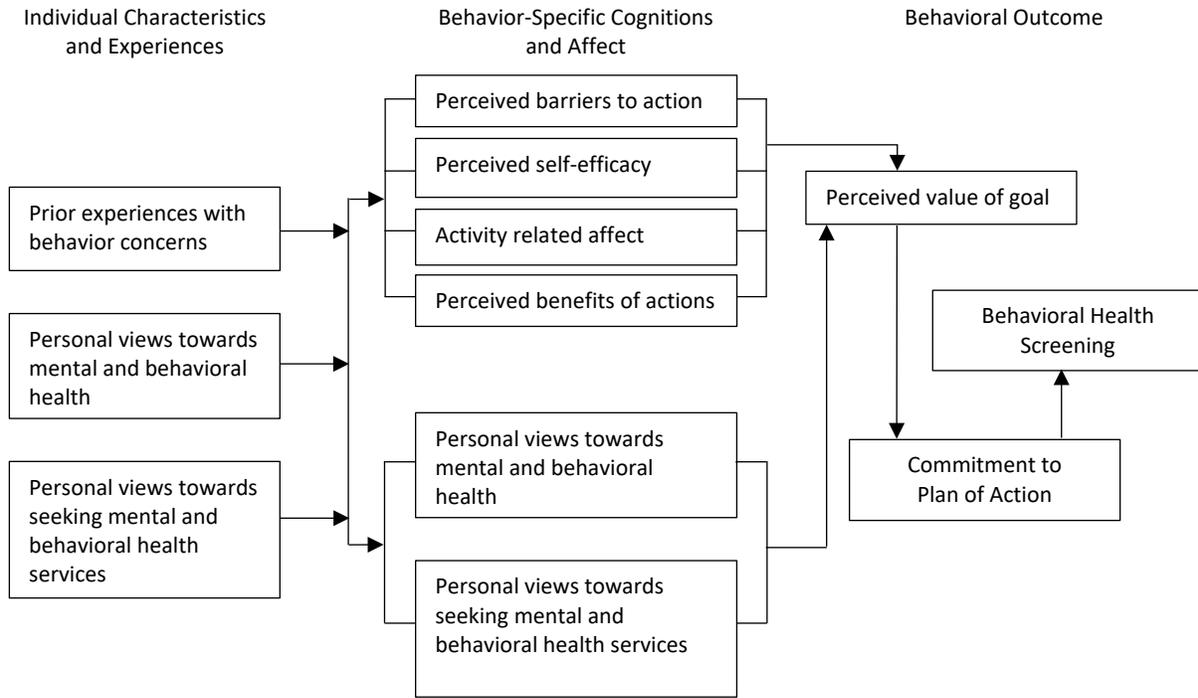
	previous studies, to evaluate the psychometric properties of the Primary Care Mental Health Screening (PCMHS) tool.				\$60,000/year and nearly 20% making over \$100,000/year.
Fothergill (2013), Assessing the Impact of a Web-Based Comprehensive Somatic and Mental Health Screening Tool in Pediatric Primary Care, Academic Pediatrics	Qualitative, Level VI, and Quantitative. Quasi-Experimental, Level 4. Three mental health screening tools were utilized at three sites, and at four primary care clinics to evaluate the impact of web-based screening tools.	120 parents completed the web-based screener. Convenience.	Evaluation of parental comfort with the screeners, self-report. Screener tools have validated in previous studies, however, the “Parent Exit Survey” was a qualitative study and was not validated and does not have a reliability level stated.	Parents reported that they felt comfortable with the web-based screener, that it saved time as the form was completed prior to the visit, and that the provider already knew the results upon entering the exam room. The results of the survey allowed the research team to gain insight into the parental comfort level and that the screener improved both parental and provider comfort levels in bringing up these sensitive areas for conversation during the visit.	Sample utilizing web-based technology not generalizable target population as not all facilities/practices are able to obtain the technological resources to administer web-based screeners.
Jonovich (2014), Impact of Pediatric Mental Health Screening on Clinical Discussion and Referral for Services, Clinical Pediatrics	Quantitative, Quasi-Experimental, Level III Intervention study, with retrospective intervention.  Prospective control group.  Randomly selected medical records were selected to assess the effects of mental health	Control Group: 146 Study Group: 146 Simple Random	The Pediatric Symptom Checklist (PSC) was utilized to identify the effectiveness of mental health screening, tool self-report/record review.  No stated validity	Positive PSC screens were identified in 31 parent reports, and 17 patient reports. 36 of the 146 records identified previous mental health diagnoses.	This study was limited to a single facility that was utilizing the PSC to screen for mental health issues, limiting the study’s ability to be generalized to the target population.

	screening.				
Kaess (2013), Risk-behaviour screening for identifying adolescents with mental health problems in Europe, European Child & Adolescent Psychiatry	Quantitative methods, Quasi-Experimental, Level 2 Randomized:179 schools were randomly selected from 11 European countries for this study. Students were assigned one of four surveys, with the ProScreen being utilized for this study to assess risk-behavior associated with mental health issues in adolescents.	Stage 1 of study: n=3,070 Adolescents from 11 European countries Stage 2 of study: n=712 Simple Random	ProfScreen Tool, self-report  No stated validity	During Stage 1, two-thirds of the participants were at-risk, and during Stage 2, n=384 required referrals to mental health providers.	Due to the number of participants from Stage 1 that did not participate in Stage 2, the sampling may not be representative of the desired population.
U.S. Preventative Task Force (2016), Screening for depression in children and adolescents: U.S. Preventative Services Task Force recommendation statement	Qualitative, Systematic Review, Level IV-Systematic Review of experimental and non-experimental studies  Publication search through PubMed, the Cochrane Library, and PsycINFO databases for articles published from May 2007 to February 2015.	2 new treatment efficacy studies met the search criteria: the original review yielded 5 studies on screening accuracy and 4 trials in 6 publications  Convenience	Outcomes Measured: Do screenings among children and adolescents in primary care lead to improved health; are depression screening instruments accurate in identifying major depressive disorders (MDD) in primary care; does screening increase the proportion of children and adolescents identified with MDD; what are the harms of screening for MDD; does treatment of MDD among children and adolescents identified in primary care improve health and other related outcomes; what are the harms of MDD treatment	Recommendations include screening for Major Depressive Disorders in all adolescents; no evidence found on recommended screening intervals; treatment options include pharmacotherapy, psychotherapy, collaborative care, psychosocial support, complementary and alternative medicine approaches.	The limited studies included in this Evidence-Based Guideline might not be generalizable to the target population if their samples were limited, or non-randomized.

			for children and adolescents		
Brino (2020), Pediatric Mental Health and the Power of Primary Care: Practical Approaches and Validating Challenges. <i>Journal of Pediatric Health Care</i>	Quantitative Level I Systematic Review. Randomized Literature search	Retrospective chart review of 237 commercially insured patients were studied	Outcomes measured: ability of the primary care office to identify and refer or manage the mental health issues identified in the patient. As well as the challenges of screening for mental health issues and managing their care in the primary care setting.	One in five children and adolescents were identified as having some form of mental health concern. The study also found that screening for mental health issues in primary care is preferred due to the shortage of appropriate mental health providers.	The limited scope of the retrospective chart review limits the application of the results to facilities that see patients that do not have commercial insurance.
De Voursney (2016), Meeting the mental health needs of children and youth through integrated care: A systems and policy perspective. <i>Psychological Services</i>	Qualitative Level V Systematic Review	Retrospective look at studies that evaluated the integration of the mental health needs of children and youth in medical homes	Outcomes measured: the study evaluated the feasibility of integrating mental health services into a setting that utilizes the medical home model. The study also evaluated the inclusion of psychologists into the medical home model to aid in the management of the ongoing mental health issues	The study found that integrating mental health services into the medical home model improves the efficacy of managing the ongoing mental health concerns of the pediatric patient. The study also evaluated the role of the parent or caregiver of the patients and found that there support in the management process improved the likelihood of successful management.  Statistical information was not provided in this study.	The study results are limited in application due to the lack of statistical information provided. The study authors also failed to provide clear information regarding the methods in which the study was developed and the manner in which it was implemented.

### Appendix E: Theory to Application Diagram

Diagram of concepts, and inquiry-based on Health Promotion Model



Adapted from: Pender, N. J., & Pender, A. R. (1996). *Health Promotion in Nursing Practice* (3rd ed.). Stamford, CT: Appleton & Lange.

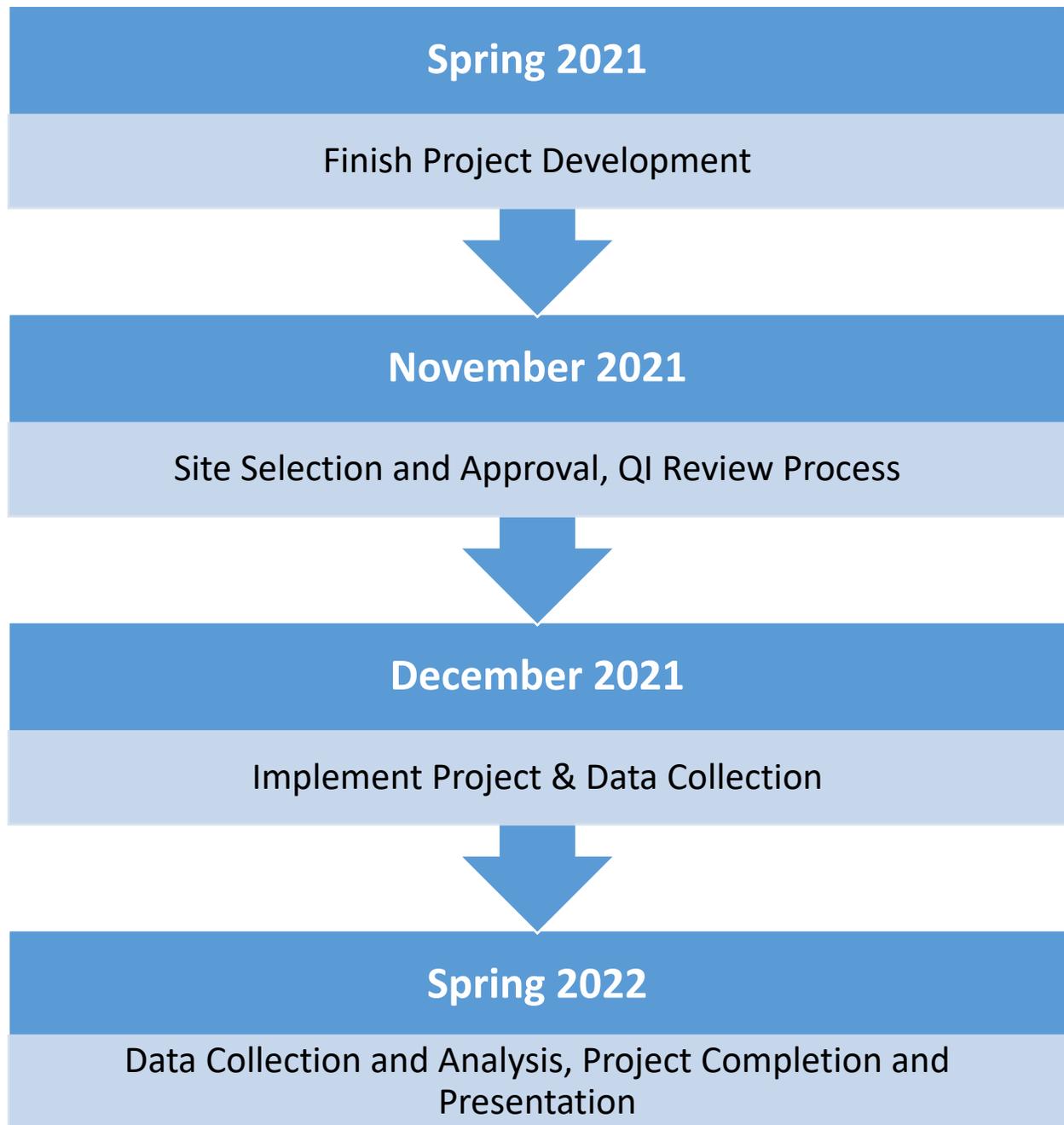
**Appendix F: Cost Table for Project**

<b>Item</b>	<b>Item Description</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Anticipated Cost</b>
Print materials	PBHS tool	400 (three pages per tool)	\$0.14 per page	\$56
Equipment	Computer/Laptop for data entry and statistical analysis	1	\$0.00 Personal laptop owned by project lead	\$0.00
Miscellaneous	N/A	N/A	N/A	\$0.00
Student Time	Project hours based on three courses (N5617, N5617B, and N5629)	330 hours	\$0.00	\$0.00
<b>Total</b>				<b>\$56</b>

**Appendix G: Intervention Flow Diagram**



**Appendix H: Project Timeline Flow Graphic**





**Appendix J: Pediatric Behavioral Health Screen Measurement Tool**



Pediatric Behavioral Health Screen (Ages 5-16)

Person Completing Form: \_\_\_\_\_ | Relation to Child: \_\_\_\_\_

INFORMATION FOR YOUR CHILD'S DOCTOR

*Emotional and physical health go together in children. Parents are often the first to notice a problem with their child's behavior and/or emotions. You can help your child get the best care possible by answering these questions. Please circle the box that best describes your child. If you do not wish to answer a question, you can leave it blank.*

Please circle the answer that best describes your child:

PSC	NEVER	SOME TIMES	OFTEN	Office Use		
				I	A	E
1. Fidgety, unable to sit still	0	1	2			
2. Feels sad, unhappy	0	1	2			
3. Daydreams too much	0	1	2			
4. Refuses to share	0	1	2			
5. Does not understand other people's feelings	0	1	2			
6. Feels hopeless	0	1	2			
7. Has trouble paying attention	0	1	2			
8. Fights with other children	0	1	2			
9. Is down on himself or herself	0	1	2			
10. Blames others for his or her troubles	0	1	2			
11. Seems to be having less fun	0	1	2			
12. Doesn't listen to rules	0	1	2			
13. Acts as if driven by a motor	0	1	2			
14. Teases others	0	1	2			
15. Worries a lot	0	1	2			
16. Takes things that don't belong to him or her	0	1	2			
17. Distracted easily.	0	1	2			

**HOW MUCH DO THE PROBLEMS OR DIFFICULTIES YOU CIRCLED ABOVE INTERFERE WITH YOUR CHILD'S EVERYDAY LIFE?**

	Not at all	Only a little	A lot	A great deal
18. Do the difficulties you checked above upset or distress your child?	0	1	2	3
19. Do the difficulties you checked above place a burden on you and your family?	0	1	2	3
20. Do the difficulties you checked above interfere with your child's home life?	0	1	2	3
21. Do the difficulties you checked above interfere with your child's friendships?	0	1	2	3
22. Do the difficulties you checked above interfere with your child's activities?	0	1	2	3
23. Do the difficulties you checked above interfere with school or learning?	0	1	2	3
24. Do you think your child might have a problem with alcohol or drugs?			YES	NO
25. Is your child in in counseling or seeing a mental health professional?			YES	NO
26. Does your child have an IEP (Individualized Educational Plan) at school?			YES	NO
27. Are there problems or concerns about your child, yourself or your family that you would like to talk about privately with your doctor?			YES	NO

## Appendix J: Pediatric Behavioral Health Screen Measurement Tool



### Behavioral Health Screening Scoring and Billing Instructions

The comprehensive screening tools were developed as a way to provide a quick measure of mental health and substance abuse issues in the primary care setting. Areas covered: substance abuse, depression, anxiety and familial relations. The backside of the forms allow for fast documentation for the medical record. The scoring instructions below correspond with the appropriate sections on each of the tools.

#### Pediatric Behavioral Health Screener

##### **PSC – Pediatric Symptom Checklist**

Transfer parents responses to the white boxes in scoring grid on right side of the page. Sum the columns to create scores for scale scores. Sum these scores to create total score.

I (Internalizing symptoms – anxiety and depression)	≥ 5 positive
A (Attention – ADHD)	≥ 7 positive
E (Externalizing symptoms – disruptive behavior)	≥ 7 positive
Total Score	≥ 15 positive

##### **Functional Impairment**

For items 18-23, any item ≥ 2 represents functional impairment and warrants further assessment.

##### **Conversation Starter Questions**

Items 24-26 are open-ended questions, included as conversation starters between the physician and the patient regarding any mental health and/or substance abuse concerns.

Item 27 is included in the event that there are issues the patient may be concerned with, which have not been covered by other questions.

#### **Screening Instructions**

1. Client (or guardian for children) completes the screening tool as part of their regular visit paperwork.
2. PCP and/or office staff calculates the score.
3. If screen is positive, PCP will discuss results with member and refer for a full assessment if needed.
4. PCP completes documentation side of the tool to place in the medical record.
5. PCP's office bills procedure code – 96160 – in addition to their E & M code.

Appendix J: Pediatric Behavioral Health Screen Measurement Tool



Pediatric Behavioral Health Screen (Ages 5-16)

Child's Name: \_\_\_\_\_
Screening Date: \_\_\_\_\_

Screening Results

Patient's Pediatric Symptom Checklist was

- Negative
Positive for
Internalizing symptoms
Externalizing symptoms
Attention symptoms
Overall symptoms

Symptoms endorsed on patient's Pediatric Symptom Checklist

- Do not result in functional impairment
Result in functional impairment for:
Child
Family
Child activities
Child's home life
Child's friendships
Child's school or learning
Caregiver has concern for patient's use of alcohol or drugs:
No
Yes
Caregiver had other concerns:
No
Yes - Concern was \_\_\_\_\_

Patient currently followed by a mental health provider:

- No
Yes - Provider is \_\_\_\_\_

Patient currently on an Individualized Education Plan at school

- No
Yes - Reason for IEP: \_\_\_\_\_

Screening Summary

Patient's overall screen was:

- Negative
Positive, but patient is already followed by a mental health provider
Positive and warrants further monitoring
Positive and warrants further assessment

Intervention

- Reviewed screening results with patient/family
Discussed with patient/family impact of screening results on patient's health & need for:
Continued monitoring of patient's symptoms
Further assessment by a behavioral health provider
Family to follow up with patient's current mental health provider
Family to follow up with patient's school personnel
If ADHD is considered, then will further assess for ADHD with Vanderbilt Assessment Protocol
Patient/family given copy of screening results

Referral

- No referral made at this time
Referred patient to in-house Behavioral Health/Pediatric Psychology service for further assessment and treatment recommendations
Referred patients to \_\_\_\_\_
Patient/family has appointment \_\_\_\_\_
Patient/family given contact number 1-800-652-2010 to call for assistance with locating a behavioral health provider to conduct further assessment.
Comments: \_\_\_\_\_



**Appendix L: Statistical Analysis Table(s) Template**

In pediatric patients, 7 to 18 years old (P), does the utilization of the Oklahoma Health Care Authority's Pediatric Behavioral Health Screen tool during annual well-child checks (I) compared to parental and/or patient report of mental health concerns (C) affect the early identification of depression and anxiety, and the rate of referrals to mental health specialists (O) over a 6-month period (T) at a pediatric primary care office serving low-socioeconomic families (S)?

	Positive for Mental Health Concerns	Functional Ability Score	Referred to Mental Health Services	Gender	Age
Study Group Patients, n=86	Yes=1/No=2	Score	Yes=1/No=2	M=1/F=2	Whole number for year
Retrospective Patient Group n=86	Yes=1/No=2	N/A	Yes=1/No=2	M=1/F=2	Whole number for year
P1	Mean Score	Mean Score	Mean Score	Value	Value
P2	Mean Score	Mean Score	Mean Score	Value	Value
P3	Mean Score	Mean Score	Mean Score	Value	Value
P4	Mean Score	Mean Score	Mean Score	Value	Value
P5	Mean Score	Mean Score	Mean Score	Value	Value

Positive for concerns: Study Results-Retrospective Results: Chi-Square

Referrals to mental health services: Study Results-Retrospective Results: Chi-Square

Demographic data: Chi-Square

**Appendix M: UMKC Faculty DNP Project Proposal Approval Letter**

June 29, 2021

UMKC DNP Student: Jesse Merino

Congratulations. The UMKC Doctor of Nursing Practice (DNP) faculty has approved your DNP project proposal, *Pediatric Behavioral Health Screening in the Primary Care Practice*.

You may proceed with IRB application

Sincerely,

A handwritten signature in black ink that reads "Cheri Barber".

Cheri Barber, DNP, RN, PPCNP-BC, FAANP  
Clinical Assistant Professor  
DNP Program Director  
UMKC School of Nursing and Health Studies [barberch@umkc.edu](mailto:barberch@umkc.edu)

A handwritten signature in purple ink that reads "Lyla Lindholm".

Lyla Lindholm, DNP, RN, ACNS-BC  
Clinical Assistant Professor, DNP Faculty  
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an equal opportunity/affirmative action institution

**Appendix N: UMKC IRB Approval Letter**

**Institutional Review Board**  
University of Missouri-Kansas City

5319 Rockhill Road  
Kansas City, MO 64110  
816-235-5927  
umkcirb@umkc.edu

Dear Cheri Ann Barber,

A member of the UMKC Research Compliance Office screened your QI Questionnaire to project #2065570-QI entitled "Pediatric Behavioral Health Screening in the Primary Care Practice" and made the following determination:

**QI Determination: The project has been determined to be a quality improvement activity not requiring IRB review.**

If you have any questions regarding this determination, please feel free to contact our office at 816-235-5927, [umkcirb@umkc.edu](mailto:umkcirb@umkc.edu), or by replying to this notification.

**Note Regarding Publications:** It is appropriate to disseminate and replicate QI/program evaluation successes, including sharing the information external to an organization. This may include presentations and publications. The mere intent to publish the findings does not require IRB review as long as the publication does not refer to the activity as research.

Thank you,  
UMKC Institutional Review Board

### Appendix O: Statistical Analysis Results Table

**Table O1: Overall Rates of Concerns Identified**

Cohort	Concerns Identified
Intervention	25.6% (n=22)
Retrospective	31.4% (n=27)

**Table O2: Concerns Identified by Gender (Intervention Cohort)**

Gender	Concerns Identified
Female	27% (n=6)
Male	73% (n=16)

**Table O3: Concerns Identified by Gender (Retrospective Cohort)**

Gender	Concerns Identified
Female	59% (n=16)
Male	41% (n=11)

**Table O4: Positive Total Score PSC-17**

Gender	Positive PSC-17
<b>Total</b>	<b>17.4% (n=15)</b>
Female	33% (n=5)
Male	67% (n=10)

**Table O5: Positive Internalizing Domain**

Cohort	Internalizing
<b>Total</b>	<b>20.9% (n=18)</b>
Female	28% (n=5)
Male	72% (n=13)

**Table O6: Positive Attention Domain**

Gender	Attention
<b>Total</b>	<b>29.1% (n=25)</b>
Female	32% (n=8)
Male	68% (n=17)

**Table O7: Positive Externalizing Domain**

Gender	Externalizing
<b>Total</b>	<b>8.1% (n=7)</b>
Female	29% (n=2)
Male	71% (n=5)

**Table O8: Overall Functional Ability Concerns Identified by Gender**

Gender	FI Concerns Identified
<b>Total</b>	<b>52.3% (n=45)</b>
Female	66.7% (n=30)
Male	33.3% (n=15)

**Table O9: Positive Functional Ability**

Gender	Positive Screens
<b>Total</b>	<b>16.3% (n=14)</b>
Female	43% (n=6)
Male	57% (n=8)

**Table O10: Referral Rates for Functional Ability**

Gender	Internal Referrals	External Referrals
<b>Total</b>	<b>22.1% (n=19)</b>	<b>2.4% (n=2)</b>
<b>Negative Screens</b>	<b>53% (n=10)</b>	<b>50% (n=1)</b>
<b>Positive Screens</b>	<b>47% (n=9)</b>	<b>50% (n=1)</b>

**Table O11: Overall Referral Rates**

Cohort	Intervention	Retrospective
<b>Total</b>	<b>24.4% (n=21)</b>	<b>11.8% (n=10)</b>
Internal Referrals	90% (n=19)	90% (n=9)
External Referrals	10% (n=2)	10% (n=1)

**Table O12: Referral Rates by Gender (Intervention Cohort)**

Gender	Internal	External
<b>Total</b>	<b>22% (n=19)</b>	<b>2.3% (n=2)</b>
Female	32% (n=6)	100% (n=2)
Male	68% (n=13)	0% (n=0)

**Table O13: Retrospective Chart Review**

Cohort	Anxiety	Depression
<b>Total</b>	<b>24.4% (n=21)</b>	<b>25.6% (n=22)</b>
Female	62% (n=13)	55% (n=12)
Male	38% (n=8)	45% (n=10)

**Table O14: Referral Rates by Gender (Retrospective Cohort)**

Gender	Internal	External
<b>Total</b>	<b>10.5% (n)</b>	<b>1.2% (n=1)</b>
Female	45% (n=4)	100% (n=1)
Male	55% (n=5)	0% (n=0)

**Table O15: Pearson Chi-Square Results**

Categories	Value	Df	Asymptomatic Significance
Positive Concerns*Referral	24.959	2	<.001
Internalizing*Referral	22.084	2	<.001
Externalizing*Referral	10.801	2	.005
Attention*Referral	10.674	2	.005
Functional Impairment*Referral	20.033	2	<.001

### **Appendix P: Executive Summary**

There are approximately 40% of children that have some form of behavioral health concerns, 11% have a significant level of functional impairment, and 5% have a severe level of impairment that disrupts their daily life. Approximately 22% of the population that has at least one treatable behavioral health concern and 28% having two or more.

#### **Purpose**

The aim of this project was to improve the identification of behavioral health concerns and their impact on functional ability of the patient and family. The other goal of the project was to improve the rate of referrals to behavioral health services for ongoing treatment and management. Improving the identification and referral rates will also reduce the risk of long-term health consequences of untreated behavioral health issues.

#### **Methods**

This project is a quantitative, quasi-experimental design that was conducted over four months, it included 86 intervention participants and for the retrospective review. The intervention tool that was evaluated was the *Pediatric Behavioral Health Screen*, a 27 question tool to evaluate for behavioral health concerns and their impact on functional ability. This project was evaluated by the University of Missouri-Kansas City Institution Review Board and deemed not to be a research project and classified as a Quality Improvement Project.

#### **Findings Overview**

This project found that 25.6% of the patients that completed the intervention had some form of behavioral health concern, 21% screen positive for depression and anxiety concerns, and 29% had concerns of ADHD, and 8.1% had concerns of disruptive behavior. Approximately 24% of patients were referred for behavioral health services, this was an increase of 110% in the

referral rate over the retrospective chart review findings.

### **Recommendations**

It is recommended that pediatric primary care offices evaluate the potential use of this screening tool for inclusion in their practice to screen for behavioral health concerns and functional impairments. By evaluating for these concerns the primary care office can ensure that patients are receive early interventions to reduce the risk long-term health consequences. The routine screening for behavioral health concerns and functional ability during well-child exams will allow providers to identify concerns early and refer patients for management. The routine screening will also allow providers to monitor concerns that have been previously identified in their pediatric patients.