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Identifying Adverse Childhood Experiences (ACEs) in a Federally Qualified Health Center using  
the Pediatric ACEs and Related Life Events Screener

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### **Abstract**

**Background:** Evidence links adverse childhood experiences (ACEs) to health issues later in life. Most research has been conducted in adults but there is a lack of recent research on the impact of ACEs in the pediatric population particularly in relation to mental health conditions. Utilizing the Pediatric ACEs Screener (PEARLS) health care providers can screen for ACEs at earlier ages.

**Purpose:** The aim of this evidence-based project is to determine if there is an increase of newly diagnosed mental health related disorders when using PEARLS compared to not using PEARLS in the previous months before implementation.

**Methods:** ACEs were identified using PEARLS at well-child visits. Regardless of scores, participants received verbal or written education on reducing stressors related to ACEs. Behavioral health outcomes were obtained via chart audits.

**Results:** A total of 2,037 PEARLS were administered. Of that, 1,949 screened negative for ACEs and 88 (4.3%) screened positive. Screening for ACEs identified that patients who screened positive who had a higher frequency of having a behavioral health diagnosis.

**Implications for Practice:** Screening for ACEs exposure in pediatrics can provide early detection and timely interventions to reduce the adverse impacts of ACEs.

**Conclusion:** Implementing of ACEs screening in a pediatric population was simple but did not result in an increase in identification of behavioral health diagnoses.

Identifying Adverse Childhood Experiences (ACEs) in a Federally Qualified Health Center using  
the Pediatric ACEs and Related Life Events Screener

Growing research and evidence links adverse childhood experiences (ACEs) to health issues that can be experienced later in life. Felitti et al. (1998) found a strong dose response relationship between the breadth of exposure to abuse or household dysfunction during childhood and multiple risk factors for several of the leading causes of death in adults. Disease conditions included ischemic heart disease, cancer, chronic lung disease, skeletal fractures, and liver disease, as well as poor self-rated health also showed a graded relationship to the breadth of childhood exposures (Felitti et al., 1998). Current studies have been conducted in adults with a history of experiencing one or more ACEs, there is limited research on ACEs' impact in the pediatric population particularly in relation to mental health conditions. Due to the recent introduction of the Pediatric ACEs Screener (PEARLS) health care providers can screen for ACEs at an earlier age, thereby providing opportunities to reduce the risk of the negative impact of ACEs as an adult. In a recent study, researchers were able to demonstrate concurrent validity in that the PEARLS was effective at identifying children at high risk for a number of clinically significant outcomes, including mental health illnesses, atopic conditions, and obesity (Thakur et al., 2020).

### **Literature Synthesis**

A literature review was conducted using the following electronic databases: EBSCOhost, CINAHL Plus, Academic Search Premier, Health Source: Nursing/Academic Edition, and APA Psych Articles. The following key words were used during the search for articles closely related

to the topics outlined in this project: “adverse childhood experiences”, “toxic stress”, “pediatric”, “population”, “mental health”, “ACEs”, “pediatric setting”, “screening”.

### **Background**

The ACEs term was first introduced in a study conducted by the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente in which the study described the long-term relationship of negative childhood experiences to important medical and public health problems by assessing, retrospectively and prospectively, the long-term impact of abuse and household dysfunction during childhood (Felitti et al., 1997). The following outcomes were addressed in adults: disease risk factors and incidence, quality of life, health care utilization, and mortality (Felitti et al., 1998). The results of this study along with subsequent studies demonstrate that there is a strong relationship with ACEs and chronic health implications often experienced in adulthood. Hughes et al. (2017) synthesized evidence for the effect of multiple ACEs and for all outcomes examined, pooled odds ratios which indicated an increased risk among individuals with at least four ACEs compared with those reporting none.

The original study population were adults (ages of 19 to 92), who were primarily Caucasian, middle class, employed, college educated, and privately insured (Felitti et al., 1998). This differs drastically from the populations in recent studies attempting to understand the impact of ACEs. Compared to the adult population, there are fewer studies outlining the impact of ACEs among the pediatric population. Children at or below the poverty level are at a greater risk for ACEs, therefore require early screening, detection, prevention, and intervention (Bethell et al., 2016). Although ACEs has been studied for over two decades, there had not been a validated screening tool to identify ACEs in a pediatric setting. However, from 2015 to 2017 The Center for Youth Wellness and Benioff Children’s Hospital Oakland (BCHO) developed a final

Pediatric ACE and other Determinants of Health Questionnaire. (Koita et al., 2018). Providers can access PEARLS in a variety of languages through the California ACEs Aware website and use the versions available in their clinical setting.

PEARLS envelopes three main domains with subcategories: abuse (physical, emotional, sexual), neglect (physical and emotional neglect), household dysfunction (parental incarceration, mental illness, substance abuse, parental separation, and intimate partner violence). The screener has two main versions: identified versus deidentified. In the identified version of the screener, the participant selects the “yes” response to the specific question asked.

Therefore, the provider can easily view the responses to the screener and choose to adjust the well child visit according to the responses. In the deidentified version, the responses to each question are not individually identified. The participant is not required to indicate “yes” or “no” to each individual question, but merely counts the total “yes” responses. Regardless of the version used, the screener identifies that ACEs are present in the individual which leads to the appropriate interventions to best meet the patients’ needs.

The American Academy of Pediatrics (AAP) advocates for the screening of Adverse Childhood Experiences (ACEs) during well-child visits by pediatric health care providers (Bryant & VanGraafeiland, 2019). Current evidence demonstrates a strong correlation between children with high ACE scores and the likelihood of physical and mental health problems as adults (Bryant & VanGraafeiland, 2019). Research has continued to identify the range of adversity experienced by the pediatric population, which is an area that was not captured within the original ACE study. Studies have demonstrated a strong association between early life adversities (ACEs before 5 years of age) and mental health outcomes, including attention deficit hyperactivity disorder (ADHD) diagnosis, in middle childhood (Hunt, Berger, & Slack, 2017;

McKelvey et al., 2018). Thakur et al. (2020) conducted a study in which the population's mean age was 5.9-year population, 76% reported one or more adversity, and older age being associated with higher PEARLS score. This highlights the importance of health care providers' roles in a pediatric setting being able to identify children who are at risk for ACEs.

### **Description of EBP Project**

This evidence-based practice project implemented ACES screening using PEARLS at two Federally Qualified Health Centers (FQHC) in a large southern California city. Screening with PEARLS was implemented from September 1<sup>st</sup>, 2020 to December 31<sup>st</sup>, 2020. The aim was to determine if there was an increased identification of newly diagnosed mental health related disorders when using PEARLS compared to not using PEARLS months before implementation.

### **Project Implementation/Process Plan**

The Chief Medical Director demonstrated a strong interest in implementing ACES screening using PEARLS at both clinical sites in March 2020. Approval from Institutional Review Board was obtained. Various meetings were held to discuss the purpose of the screening tool and organize it into the workflow of the clinics. A driving force in implementing PEARLS was the financial incentive in being reimbursed for screening for ACEs. Effective January 1, 2020, California introduced an opportunity in which participating providers screening for Adverse Childhood Experiences (ACEs) could receive a reimbursement rate up to \$29 for each qualifying ACEs screener (Department of Health Care Services-DHCS, 2019). In order to receive reimbursement, participating providers were required to complete the DHCS training for ACEs screening and trauma-informed care (DHCS, 2019). The translated versions of the screening tool and patient education materials were gathered to meet the language specific needs

of the population. The electronic health record was updated in order to accurately display and account for the PEARLS screening scores. The screening tool was piloted at one clinical site to randomly selected patients of two providers whose patients were between 4 and 18 years of age. It should be noted the screenings completed during the two-week pilot period are not included in the final data or results of this project. The screening tool was launched shortly after the stakeholder meeting at both sites in September 2020. Over the ensuing four months, data was collected, and chart audits were performed. Data and results were reviewed in the following three months.

### **Evidence – Based Practice (EBP) Model**

The Iowa model was chosen as it provides guidance for nurses and other clinicians in making decisions about clinical and administrative practices that affect healthcare outcomes (Melnyk & Fineout-Overholt, 2019, p. 389). Similar to other EBP models, the Iowa model initially identifies a healthcare issue that can be improved and critically appraises evidence that substantiates the desired EBP change. However, there are various components that set it apart from other EBP models, such as patient engagement, consideration of potential barriers, and reinfusion. Reinfusion involves proactive planning, which helps avoid relapsing to old routines and monitoring data trends that determine whether reinfusion is needed. This EBP model was best suited for the implementation of ACEs screening.

### **Methods**

The deidentified versions of PEARLS were administered to pediatric patients at two FQHCs in San Diego, CA. Both sites are culturally diverse and provide care for underserved populations. Over five languages are considered to be primary languages, and there are a variety of education levels. The patient population at one clinic is

predominantly Hispanic. The patient population at the other site is also predominantly Hispanic with a large Asian population. These sites commonly serve children and adolescents whose experiences include refugee, immigrant, low socioeconomic status, foster care, language barriers, and multigenerational home backgrounds.

PEARLS was administered to participants, between the ages of 4 and 18 during their well – child visits from September 2020 - December 2020. Verbal consents were obtained from all participants who were provided with an explanation of the purpose of the screener. The caregiver for patients ages 4 – 11 completed the Child-Caregiver screener (Table 1) while patients ages 11 – 18 completed the Teen – Self screener (Table 2). Patients who met the eligibility criteria from 12 health care providers were included in this project. PEARLS is separated into two parts: part I with ten questions and part two with seven questions. The specific questions in part I can be seen in Table 1. Only part I is used to determine if a patient screens positive or negative for ACEs. A score equal to or less than three corresponds to screening negative for ACEs, a score equal to or greater than four corresponds to screening positive for ACEs. Regardless of the score, all patients received education, verbal or written, on reducing stressors related to ACEs. Those who screened positive were offered appropriate behavioral health interventions (BHI) or referrals along with education. The chief medical officer incorporated a method to track screening for ACEs in to the EHR, including the appropriate billing codes.

Table 1

*Child Pediatric ACEs and Related Life Events Screener (PEARLS)\****Pediatric ACEs and Related Life Events Screener (PEARLS)**

Child (Parent-Caregiver Report)

Deidentified

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1	Has your child ever lived with a parent/caregiver who went to jail/prison?
2	Do you think your child ever felt unsupported, unloved and/or unprotected?
3	Has your child ever lived with a parent/caregiver who had mental health issues? <i>(for example, depression, schizophrenia, bipolar disorder, PTSD, or an anxiety disorder)</i>
4	Has a parent/caregiver ever insulted, humiliated, or put down your child?
5	Has the child's biological parent or any caregiver ever had, or currently has a problem with too much alcohol, street drugs or prescription medications use?
6	Has your child ever lacked appropriate care by any caregiver? <i>(for example, not being protected from unsafe situations, or not cared for when sick or injured even when the resources were available)</i>
7	Has your child ever seen or heard a parent/caregiver being screamed at, sworn at, insulted or humiliated by another adult? Or has your child ever seen or heard a parent/caregiver being slapped, kicked, punched beaten up or hurt with a weapon?
8	Has any adult in the household often or very often pushed, grabbed, slapped or thrown something at your child? Or has any adult in the household ever hit your child so hard that your child had marks or was injured? Or has any adult in the household ever threatened your child or acted in a way that made your child afraid that they might be hurt?
9	Has your child ever experienced sexual abuse? <i>(for example, anyone touched your child or asked your child to touch that person in a way that was unwanted, or made your child feel uncomfortable, or anyone ever attempted or actually had oral, anal, or vaginal sex with your child)</i>
10	Have there ever been significant changes in the relationship status of the child's caregiver(s)? <i>(for example, a parent/caregiver got a divorce or separated, or a romantic partner moved in or out)</i>

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*Note.* Adapted from ACEs Aware, created in partnership with the University of California San Francisco School of Medicine and the Center for Youth Wellness. Copyright 2021 by the State of California Department of Health Care Services.

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Table 2

*Teen Pediatric ACEs and Related Life Events Screener (PEARLS)\**

<b>Pediatric ACEs and Related Life Events Screener (PEARLS)</b>	
Teen (Self-Report)	
Deidentified	
1	Have you ever lived with a parent/caregiver who went to jail/prison
2	Have you ever felt unsupported, unloved and/or unprotected
3	Have you ever lived with a parent/caregiver who had mental health issues? (for example, depression, schizophrenia, bipolar disorder, PTSD, or an anxiety disorder)
4	Has a parent/caregiver ever insulted, humiliated, or put you down?
5	Has your biological parent or any caregiver ever had, or currently has a problem with too much alcohol, street drugs or prescription medications use?
6	Have you ever lacked appropriate care by any caregiver? (for example, not being protected from unsafe situations, or not being cared for when sick or injured even when the resources were available)
7	Have you ever seen or heard a parent/caregiver being screamed at, sworn at, insulted or humiliated by another adult? Or have you ever seen or heard a parent/caregiver being slapped, kicked, punched beaten up or hurt with a weapon?
8	Has any adult in the household often or very often pushed, grabbed, slapped or thrown something at you? Or has any adult in the household ever hit you so hard that you had marks or were injured? Or has any adult in the household ever threatened you or acted in a way that made you afraid that you might be hurt?
9	Have you ever experienced sexual abuse? (for example, has anyone touched you or asked you to touch that person in a way that was unwanted, or made you feel uncomfortable, or anyone ever attempted or actually had oral, anal, or vaginal sex with you)
10	Have there ever been significant changes in the relationship status of your caregiver(s)? (for example, a parent/caregiver got a divorce or separated, or a romantic partner moved in or out)
<i>Note.</i> Adapted from ACEs Aware, created in partnership with the University of California San Francisco School of Medicine and the Center for Youth Wellness. Copyright 2021 by the State of California Department of Health Care Services.	

Data was abstracted from May 2020 to December 2020. The data set included: age, ethnicity, gender, score on adverse childhood experiences screening tool, and International Classification of Diseases (ICD) – 10 codes. A list of behavioral health ICD-10 codes were gathered and further distilled into six BH diagnoses (anxiety, anxiety and depression, depression, ADHD, GAD, and stress).

**Results**

The control group consisted of 1,450 well-child visits from May 2020 to August 2020, during which PEARLS was not administered. From September 2020 to December 2020, a total of 2,037 PEARLS were administered by among 12 healthcare providers at 2 locations. The number who screened negative for ACEs was 1,949 and 88 screened positive. This is equivalent to 4.3% of the pediatric population screening positive for ACEs.

The implementation of PEARLS at the two clinic sites did not result in an increased identification of pediatric of behavioral health (BH) diagnosis among the pediatric population. This can be seen in Fig. 1 where only 8.6% of the population that completed PEARLS had a BH while the control group had 10.6% of the population with a BH diagnosis.

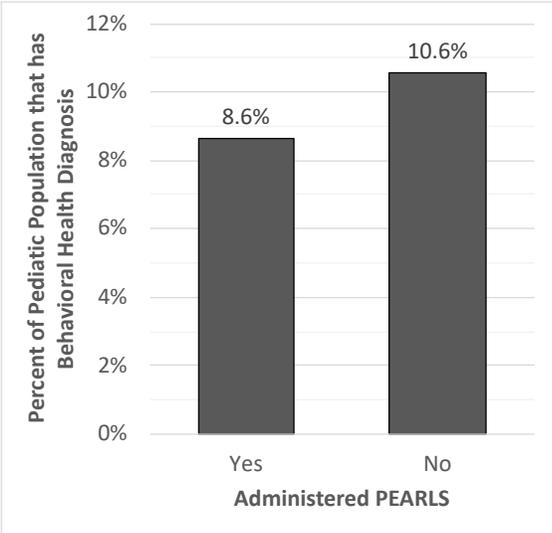


Figure 1. Pediatric population that has a behavioral health (BH) Diagnosis

The project focused on six BH diagnoses: anxiety, depression, depression with anxiety, attention deficit hyperactivity disorder (ADHD), stress disorder, and generalized anxiety disorder (GAD). As expected, patients who screened positive for ACEs have an increased rate of at least one BH diagnosis (31.8%) in comparison to those screened negative (7.6%) as seen in Fig. 2.

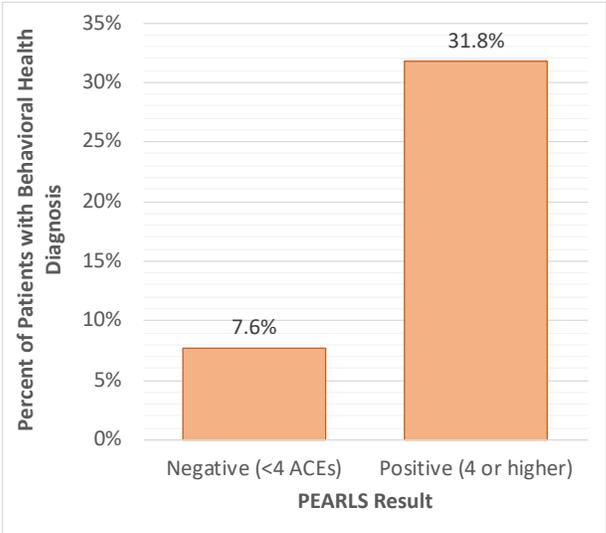


Figure 2. Pediatric population that has a BH diagnosis with either a negative or positive score

The percentage of patients who have been diagnosed with each of the six BH diagnoses for three different groups is shown in Fig.3. The groups include where no PEARLS were administered from May – August (green), patients who screened negative for ACEs (blue), and patients who screened positive for ACEs (orange). There is a significant increase incidence of depression, anxiety, anxiety with depression, and ADHD for patients who screened positive for ACEs. There was an increase in rates of depression (from 3.1% to 14.3%) comparing the control group to the patients who screened positive for ACEs. There was an increase in anxiety (4.8% to 12.1%), of anxiety with depression (0.4% to 3.3%), and of ADHD (2.8 % to 6.6%). There was not an increase in Generalized Anxiety Disorder (GAD) and stress, though those diagnoses are less common in this population.

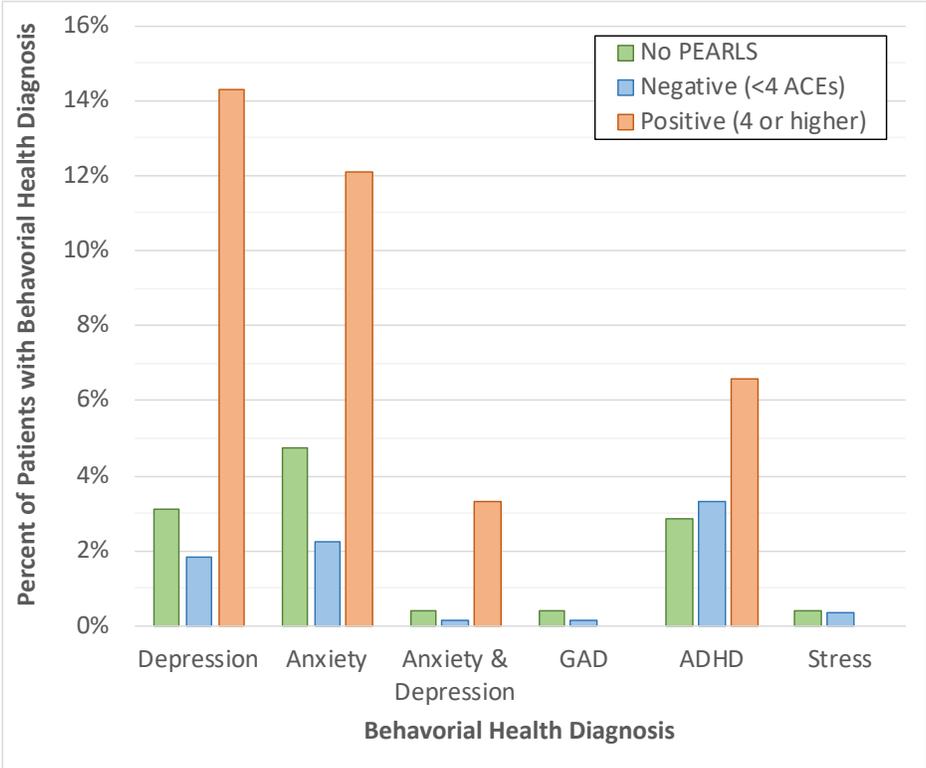


Figure 3. Pediatric population with BH diagnosis for depression, anxiety, GAD, ADHD, stress, anxiety & depression

The percentage of pediatric patients who completed PEARLS, with at least one BH diagnosis, and their age at the time of visit is shown in Fig. 4. The percentage of BH diagnoses increased with age from 4 to 18 years old. From ages 4 – 14 the percentages consistently increase. The highest percentage of at least one BH diagnosis is experienced at 15 years of age (18.3%) and it appears to level off by age 18 (14.9%).

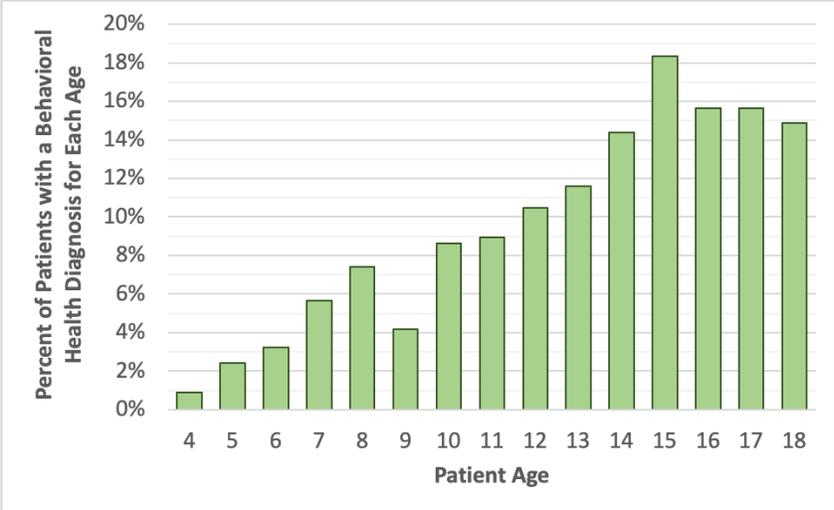


Figure 4. Percentage of pediatric patients with a BH diagnosis at specific ages

It is important to analyze the referral outcomes for patients who screened positive for ACEs. The outcomes are shown in Fig. 5. Of the 88 patients, 27 of them were already receiving behavioral health interventions. There were 20 patients who screened positive but refused a referral. However, there were 19 patients who did accept a BH referral and were seen. Of the 88 patients, 3 were referred but not seen by BH. Due to missing data for 19 of the patients, it is not known whether BH services were refused or if a referral was ever made.

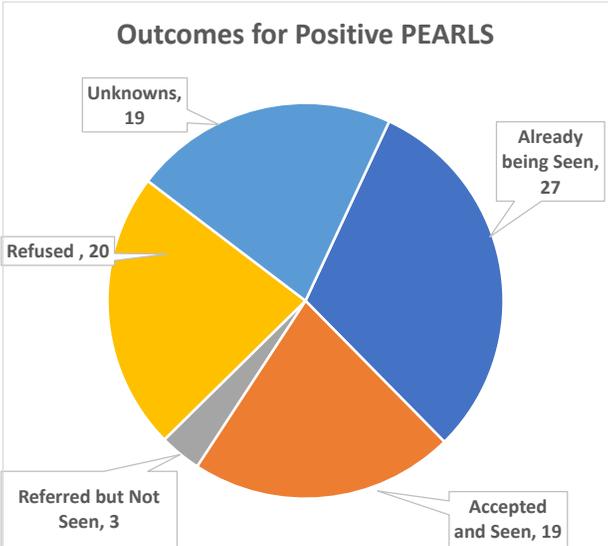


Figure 5. BH services outcomes for pediatric patients who score positive for PEARLS

### **Discussion**

It was feasible to implement ACEs screening using PEARLS at both clinic sites, incorporating it into each patients' well child visits as well as into the clinic workflow. A vital component in implementing PEARLS at was a strong interest from the chief medical officer and providers. A large portion of the clinic's pediatric patients already have behavioral health diagnoses and are receiving behavioral health interventions. This project encompasses a high-risk pediatric population in which children are predisposed to ACEs at a much earlier age. Screening for ACEs identifies the many adversities present and emphasizes the importance of screening for ACEs. The pediatric population can be screened for ACEs once yearly, which is beneficial as it shown that as children age, there is a higher incidence of screening positive and having a BH diagnosis. The results also highlight the need in funding mental health services, particularly among the pediatric population.

As this is first time screening for ACEs was implemented at both sites, there is room for improvement. The results in screening for ACEs may be impacted by cultural backgrounds and biases as well as language barriers. It is difficult to determine how forthright patients or caregivers were in answering the questions in the screener. The pediatric population that participated in this project had very diverse backgrounds and languages. While PEARLS has been translated into various languages, there are many low incident languages that are predominant in the population included in this project. There is also the potential fear of consequences when answering "yes" to the screener's questions. Healthcare providers are mandated reporters, thus if any of the responses indicate further investigation by child protective services, caregivers or patients may be hesitant in responding honestly due to the potential associated repercussions.

Health care providers in a pediatric setting are vital in establishing trust and serve as a medical home among families and patients. This project, supported by numerous research and studies, demonstrates the significance of screening for ACEs. It supports the importance and impact of screening for ACEs in today's society. This is especially true in underserved and diverse communities where the population faces risk factors associated with poor health outcomes. In the future, further revision of the electronic health record (EHR) could better capture referrals, loss of follow-up, refusal or acceptance of behavioral health services, and document where the patient is receiving behavioral health services. Obtaining this information via the EHR can help guide the direction of the behavioral health interventions, including the impact of the interventions.

### **Conclusions**

Healthcare providers in a FQHC serve a diverse pediatric population and are in a prime position to screen for ACEs. Early detection and timely interventions can be initiated at a younger age and in turn can reduce the likelihood of experiencing the effects of ACEs in adulthood. Trauma informed care can be provided to those experiencing ACEs and assist in developing mechanisms to reduce the effects of trauma. While the results did not reveal an increase in the initial behavioral health diagnoses, it does support previous research of populations experiencing four or more ACEs in their lifetime. Given the current coronavirus pandemic, ongoing screening for ACEs can identify any new or previous health associated conditions among the pediatric population. Normalizing ACEs screening using PEARLS can help reduce the hesitancy in answering truthfully to the questions indicated in the screener. Some of the questions may be retraumatizing for any person of any age, thus establishing trust and remaining unbiased is of utmost importance when screening for ACEs. PEARLS provides a

strong foundation in screening for ACEs among the pediatric population, but further research is needed to determine the impact of the interventions when screening positive.

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