

INCREASING PROVIDER KNOWLEDGE OF ADVERSE CHILDHOOD  
EXPERIENCES SCREENING IN PEDIATRIC PRIMARY CARE

by

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As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Sonora McKenzie Robison, titled Increasing Provider Knowledge of Adverse Childhood Experiences Screening in Pediatric Primary Care and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

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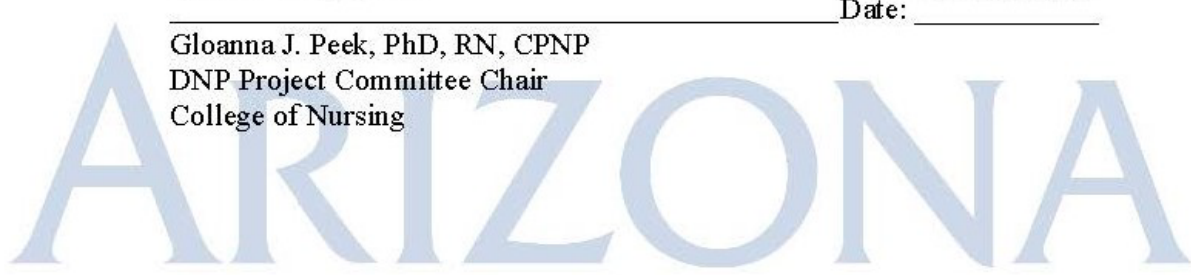
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Final approval and acceptance of this DNP project is contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

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## ABSTRACT

### **Purpose**

The purpose of this quality improvement project was to develop and present an evidence-based educational presentation for primary care pediatric providers about Adverse Childhood Experiences (ACEs) and current evidence-based ACEs screening tools at West Valley Pediatrics.

### **Background**

The 2018 report from the National Survey of Children's Health (NSCH) found that roughly 30% of respondents reported at least one ACE, with 14% of respondents experiencing more than two. Exposure to ACEs can lead to children experiencing toxic stress, putting them at increased risk for health and behavioral issues including smoking, drinking alcohol, and antisocial behaviors. Screening for ACEs can help identify children and their families at increased risk for ACEs and can be helpful in early referral for support services or intervention.

### **Methods**

This quality improvement (QI) project used a quantitative, one group study design with a convenience sample of primary care providers from West Valley Pediatrics. Data for this project was collected using a pretest, evidence-based educational presentation, posttest, and a follow-up survey.

### **Results**

A total of five (n=5) pediatric primary care providers at West Valley Pediatrics completed all components of the project. Results of the pretests and posttests revealed an average score of 73% on the pre-test and 81% on the posttest. Although the paired test showed a p value of 0.17, which is not considered statistically significant (p value <0.05), the participant scores

increased by 9% from the pretest to the posttest after the intervention. The follow-up survey found that participants stated an intent to start screening and felt the intervention increased their knowledge.

### **Conclusions**

Pediatric primary care providers have a critical role in early identification and intervention with children experiencing ACEs can improve the long-term outcomes of children with ACEs. Provider education is the first step to addressing ACEs in pediatric primary care. This project demonstrated that with education, participants had an increased knowledge of ACEs and screening for ACEs and are more likely to start screening in their practice.

## INTRODUCTION

A study of 17,337 participants found that approximately 64% of adults reported experiencing at least one childhood adversity, and 14% reported four or more adversities (DiGangi & Negriff, 2020). The prevalence of adverse childhood experiences (ACEs) in children is increasing rapidly (DiGangi & Negriff, 2020). A recent study found that 15% of 3241 children aged 3 and 30% of 545 children aged 10 experienced at least one ACE (DiGangi & Negriff, 2020). Adverse childhood experiences are classified into three main categories of abuse, neglect, and household dysfunction (Gilgoff et al., 2020). Neglect can be physical or emotional, and abuse can be physical, emotional, or sexual (Gilgoff et al., 2020). Household dysfunction can include exposure to mental illness, violence toward the mother, an incarcerated relative, substance abuse, and various forms of parental separation, including divorce (Gilgoff et al., 2020).

Research has linked ACEs during sensitive periods of development to disruptions in the body's stress response system (Kong et al., 2021). Disruptions involving dysregulated cortisol lowers a person's threshold of responding to stressful events, placing them at increased risk for physical and mental health issues over time (Gilgoff et al., 2020; Kong et al., 2021). Some adverse health outcomes associated with ACEs include asthma, obesity, sleep disturbances, delinquent behavior, developmental delays, failure to thrive, and frequent infections (Gilgoff et al., 2020). Identifying children experiencing ACEs is crucial for early intervention. There are several evidence-based screening tools available for pediatric primary care providers to assess for ACEs in the clinical setting. The Pediatric ACEs and Related Life Event Screener (PEARLS) tool was developed to screen for ACEs and adversities considered risk factors for toxic stress in

children (Thakur et al., 2020). Toxic stress is the excessive activation of stress response systems on the developing brain, immune system, metabolic system, and cardiovascular system (University, 2022).

### **Background Knowledge and Significance**

The Centers for Disease Control and Prevention (CDC) conducted the first study related to ACEs in 1995 and found around two-thirds of 9,508 participants reported at least one ACE (Felitti et al., 1998; Legislatures, 2022). The 2018 report from the National Survey of Children's Health (NSCH), which is a cross-representative of child health status in the United States (US), found that roughly 30% of respondents reported at least one ACE, with 14% of respondents experiencing more than two (Legislatures, 2022). In addition, the NSCH reports that the most common ACEs are economic hardship and parental separation (Legislatures, 2022). Parental separation is defined as parents who separated or divorced, and economic hardship is defined as difficulty or inability to pay for food, housing, or basic needs (Boullier & Blair, 2018; Braveman et al., 2017). ACEs can be manifested in a variety of ways including: chronic diseases and behavioral issues, obesity, autoimmune disease, depression, and substance abuse disorders (Legislatures, 2022). The studies conducted since the initial ACEs study have found that the greater number of reported ACEs, the higher the risk for adverse outcomes (Legislatures, 2022). Exposure to ACEs can lead to children experiencing toxic stress, putting them at increased risk for health and behavioral issues including smoking, drinking alcohol, and antisocial behaviors (Boullier & Blair, 2018; Gilgoff et al., 2020).

ACEs can impact children's physical and mental well-being throughout their lifespan. Research has found that any exposure to an ACE can disrupt the child's neurodevelopment,

progressing to emotional and cognitive impairment, and is manifested in acute and chronic disease and disability, increase in risk-taking behaviors, and can result in an early death (Boullier & Blair, 2018). In a review article of the current literature on ACEs, Boullier and Blair (2018) report an increased risk of developing chronic diseases including cancer, heart disease, and diabetes. In addition, the article states that adults who reported four or more ACEs were four times as likely to be diagnosed with type 2 diabetes and three times as likely to be diagnosed with cardiovascular disease prior to age 69 (Boullier & Blair, 2018).

Screening for ACEs can help identify children and their families at increased risk for ACEs and can be helpful in early referral for support services or intervention (University, 2022). Identifying at-risk children through screening aims to prevent further ACE exposure with early intervention (University, 2022). Healthcare providers should first understand ACEs and their impact on the physical and mental well-being of the child (Boullier & Blair, 2018). The American Academy of Pediatrics (AAP) and the National Association of Pediatric Nurse Practitioners (NAPNAP) have both released policy statements discussing the role of the pediatric primary care provider in recognizing and identifying ACEs through routine screenings. In addition, both the AAP and NAPNAP provide guidance on resources for support and management of children at risk for ACEs (Goddard, 2021).

Even though ACEs are becoming a more prevalent topic within the healthcare community, a pilot study of 48 pediatric primary care providers (PCPs) on screening for ACEs found that 76% of surveyed providers were not familiar with ACEs or the appropriate screening tools for ACEs (Popp et al., 2020). There are some challenges with screening for ACEs, including which tool to use for screening, which ACEs to screen for, what to do with those

results, and a potential lack of resources available to address high-risk screens (Popp et al., 2020). The pediatric PCP is uniquely positioned to screen for ACEs in the pediatric primary care setting based on the current recommendations for frequency and role of well-child visits.

### **Local Problem**

According to the Arizona Department of Health Services (AZDHS) and data from the 2017-2018 NSCH, 43% of 1242 Arizona children experienced at least one ACE compared to the national rate of 39.8% (Mantina et al., 2021). Another NSCH dataset from 2017-2019 also showed that Arizona children have a higher rate than the national average of experiencing two or more ACEs, at 21.9% versus 18.2% (Mantina et al., 2021). The most prevalent ACEs experienced by Arizona children are family divorce/separation, difficulty providing for basic needs on family's income, and living with someone with an alcohol/drug problem (Mantina et al., 2021). The prevalence of ACEs was compared from the 2016-2017 data to 2018-2019 data, and a few areas did show a significant decrease in prevalence (Mantina et al., 2021). The most notable of these decreases was a 21% decrease in children living with someone with an alcohol/drug problem and a 20% decrease in children that experienced family divorce/separation (Mantina et al., 2021). Despite these decreases, 24.9% of children still experienced family divorce/separation, and 10.8% lived with someone with an alcohol/drug problem, both percentages higher than the national average (Mantina et al., 2021). Another concerning change in comparing the previous data to current data was a 25% increase in children living with someone mentally ill, now sitting at 10.4%, also higher than the national average of 8.1% (Mantina et al., 2021).

The Arizona Department of Health Services (AZDHS) also found that more female children, 45%, experienced ACEs than male children at 41% (Mantina et al., 2021). Older children ages 12-17 were reported to have experienced more ACEs than younger children, roughly a 10% difference (Mantina et al., 2021). Another significant finding was that 40% of children with special health care needs (CSHCN) were found to have two or more ACEs compared to 18% of children without special healthcare needs (Mantina et al., 2021). Race, household income, and parental education level was also found to correlate to reported ACEs. (Mantina et al., 2021). In Arizona, African American children had the highest reported percentage of two or more ACEs at 34%, followed by 26% of multi-racial children (Mantina et al., 2021). There is a direct correlation of increased ACEs in children closer to the federal poverty level for household income (Mantina et al., 2021). Parent education level is also a risk factor for reported ACEs, with a significant increase associated with parents who had minimal education, defined as those with some college, a high school degree, or less than a high school degree (Mantina et al., 2021).

### **Intended Improvement**

#### **Project Purpose**

The purpose of this QI project was to develop and present an evidence-based educational presentation for primary care pediatric providers about ACEs, the associated impact on childhood growth and development, and current evidence-based ACEs screening tools at West Valley Pediatrics.

**Project Question**

Does an evidence-based ACEs educational presentation for pediatric primary care providers increase provider knowledge of ACEs and their intent to screen for ACEs in primary care?

**Project Objectives**

The objective of this DNP project was to increase pediatric primary care provider's knowledge about ACEs and screening for ACEs in the primary care pediatric setting. Three specific aims were identified to meet this objective.

***Aim 1***

Deliver a 15-minute evidence-based educational session to improve primary care provider knowledge on ACEs and screening for ACEs in the pediatric primary care setting.

***Aim 2***

Evaluate the effectiveness of the evidence-based, provider-focused educational intervention through comparison of pre-education and post-education questionnaires assessing on ACEs and ACEs screening in the pediatric primary care setting.

***Aim 3***

Deliver a web-based survey to see if there has been an increase in provider screening practices or an intent to screen in the pediatric primary care setting three weeks following the educational intervention.

## **Major Concepts Defined**

The major concepts for this DNP project are as follows:

### **Education**

Education is the transmission of knowledge. For this DNP project, a thorough review of the literature on ACEs and the associated impact on growth and development and the significance of screening for ACEs in the pediatric primary care setting was used to create an evidence-based educational intervention for pediatric primary care providers.

### **ACEs**

In the context of this DNP project, ACEs referred to abuse, neglect, and traumatic experiences during childhood.

### **Children**

For this DNP project, children were defined as any person under the age of 18 years old.

### **Screening/Screening Tool**

For this DNP project, screening was defined as the purposeful utilization of a validated screening tool to objectively screen for ACEs in pediatric patients. A screening tool was defined as an evidence-based, validated assessment that can be utilized to identify ACEs in pediatric patients.

### **Provider**

In the context of this DNP project, provider was defined as any pediatrician, pediatric physician assistant, and pediatric nurse practitioner in the primary care setting.

### **Theoretical Framework**

The adult learning theory (ALT) is a learning theory created by Malcolm Knowles that focuses on the critical concept that adults learn differently than children (Mukhalalati & Taylor, 2019). Knowles' theory is based on the understanding that adults draw on their previous experiences to create new learning (Cox, 2015). ALT has guided adult teaching strategies in professional settings to tailor education to adults (Mukhalalati & Taylor, 2019). ALT is essential for education in healthcare because evidence-based practice is rooted in educational philosophies and theories (Mukhalalati & Taylor, 2019). Using theories to support and guide educational content creates the best opportunity for effective and efficient education for healthcare providers (Mukhalalati & Taylor, 2019).

Part of Knowles' theory is the andragogical model, which is a transactional model that focuses on the characteristics of the learning transaction (Holton et al., 2001). Knowles andragogy was initially presented with four assumptions of adult learners but has since evolved to include six assumptions that influence their approach to learning (Cox, 2015; Holton et al., 2001). Those characteristics are 1) the need to know, 2) adults are self-directed, 3) an abundance of prior life and work experience, 4) learn when ready or when there is a need, 5) adults are life-centered, and 6) respond to internal and external motivators (Cox, 2015). Adults are driven to learn when the content relates to real-world problems they experience. Being self-directed refers to the autonomy of adults and that they are responsible for their own decisions as they relate to setting attainable educational goals. Prior life and work experience can guide and inspire new learning in adults (Cox, 2015). Adult learners seek education when life or work requires it or when a life experience sparks a need to understand or change something new. The concept of

adults being life-centered stems from the desire to have practical new knowledge or learning that can solve a current problem. Adult learners respond to internal motivators such as a personal value or drive to achieve a goal (Cox, 2015). They also respond to external motivators such as a better job or increased pay with the achievement of further learning (Cox, 2015). Understanding the characteristics of adult learners can help guide the creation of educational content intended for adults.

Knowles' theory also includes the andragogical process design, which provides a step-by-step guide for creating adult learning experiences (Holton et al., 2001). The andragogical process has a total of eight steps, which are 1) preparing learners, 2) creating a conducive environment for learning, 3) involving learners in planning, 4) having participants identify their learning needs, 5) involving participants in objective forming, 6) involving learners in the creation of learning plans, 7) helping learners carry out learning plans, and 8) having learners evaluate their learning outcomes (Holton et al., 2001). Andragogy as a transactional model of adult learning can be applied in any situation where adult learning may occur; it was not intended for just one particular setting (Holton et al., 2001).

This DNP project utilized Knowles' andragogical approach as a framework to create and deliver an educational intervention for pediatric PCPs. The project site was not currently screening for ACEs as part of pediatric primary care. Providers at this practice identified that their knowledge about ACEs, implications of ACEs, and ACEs screening practices are lacking. They agreed to participate in an educational intervention, demonstrating preparedness to learn. The intervention was completed via an online presentation that providers completed at their convenience; the only requirements were access to their email and the internet. Delivering the

education in this manner ensured a climate conducive to learning. The diagnosis of needs was completed via a pretest that providers completed to demonstrate a baseline knowledge level about ACEs. The objectives of the educational intervention were clearly stated at the beginning of the presentation, so providers understood the purpose and goal of the education. The learning activities were designed to promote independent study and factored in provider expertise and experience in pediatric primary care by tailoring the educational intervention specifically to pediatric PCPs. The evaluation stage consisted of a posttest to evaluate the provider's knowledge following the intervention and determine if the objectives were met. Further evaluation consisted of a provider-completed survey to determine if the education was effective or should be modified to better suit pediatric primary care providers.

The ALT was chosen as a framework for this project because it helps guide the creation of content for adult learners. Healthcare educators are not always formally trained educators; many are nurses or providers that take on the responsibility of training their colleagues in specific areas of interest. The ALT is especially helpful in creating educational content for healthcare professionals because many healthcare educators were not trained as educators so they create and deliver content differently than an educator would; basing much of their education styles on lived experiences (Mukhalalati & Taylor, 2019). Having the ALT as a foundation for educational interventions allows healthcare educators to effectively transfer knowledge gained through research, experience, and formal training to colleagues (Mukhalalati & Taylor, 2019). Most practice changes in healthcare are influenced by theoretical knowledge formed by practice, leading to further practice changes in an ongoing cycle (Mukhalalati & Taylor, 2019). See Table 1 for a depiction of how the ALT theory was used to guide this DNP project.

**Table 1***Process Elements of Andragogy*

<b>Process Elements</b>	
<b>Element</b>	<b>Andragogical Approach</b>
Preparing Learners	<ul style="list-style-type: none"> <li>• Provide information about DNP project</li> <li>• Prepare participants for participation</li> <li>• Begin thinking about content</li> </ul>
Climate	<ul style="list-style-type: none"> <li>• Environment of participants choosing</li> <li>• Informal</li> <li>• Respectful</li> </ul>
Planning	<ul style="list-style-type: none"> <li>• Done by DNP student with input from learners at the preparation stage</li> </ul>
Diagnosis of Needs	<ul style="list-style-type: none"> <li>• Done by DNP student through community assessment</li> <li>• Implementation site expressed a need</li> </ul>
Setting of Objectives	<ul style="list-style-type: none"> <li>• Done by DNP student with input from learners at the preparation stage</li> </ul>
Designing of Learning Plans	<ul style="list-style-type: none"> <li>• Done by DNP student through literature synthesis and supported by current evidence</li> <li>• Created based on readiness of learners</li> </ul>
Learning Activities	<ul style="list-style-type: none"> <li>• Independent study</li> <li>• Web-based to be easily accessible</li> </ul>
Evaluation	<ul style="list-style-type: none"> <li>• Learner collected evidence from pre/post intervention questionnaires</li> <li>• Learner collected evidence from follow-up survey</li> </ul>

Developed from Knowles (1992) and Knowles (1995)

### Literature Synthesis

#### Evidence Search

A literature search was conducted to demonstrate how ACEs influence child development. The search was targeting evidence to support the screening process in primary care. The search focused on children and providers. PubMed was the database utilized for this search. Search terms included “adverse childhood events,” “ACEs and childhood development,” “ACEs and toxic stress,” “ACEs in primary care,” “screening for ACEs,” and “pediatric ACEs

and related life events.” These searches provided 5,560 results. Articles were excluded if a full text was not available or written before 2017. Articles were excluded by title or abstract if the content did not fit the project topic. A total of 36 articles met the inclusion criteria for appraisal of the evidence. The key themes of the evidence search were ACEs screening, barriers to ACEs screening, available screening tools, controversy around screening for ACEs, and the association of trauma-informed care and ACEs.

### **Comprehensive Appraisal of Evidence**

The long-term impact of ACEs on children’s health and development has been an ongoing topic for pediatric providers for many years (Loveday et al., 2022). The American Academy of Pediatrics (AAP) has recommended screening children for ACEs since 2012 (Loveday et al., 2022). Despite the knowledge surrounding ACEs and their significant impact on children, a systematic review found that 61% of the 302 pediatric primary care providers in the AAP 85th periodic survey were not screening for ACEs (Loveday et al., 2022; Szilagyi et al., 2016). There are several recurring reasons providers are not routinely screening for ACEs; some of these include the concept that ACEs fall into the category of mental health and not physical well-being, uncertainty with which adversities to screen for, feeling unprepared to address results of screening, inadequate community resources for individuals identified as high risk, and lack of education surrounding screening tools (Popp et al., 2020; Watson, 2019). Many providers are aware of the significance of ACEs, around 59% from one study, but of those, only 24% had ever received education about screening for ACEs (Popp et al., 2020).

Another concern with screening implementation that was frequently mentioned was increased time added to the visit; however, Crenshaw et al. (2021) found that less than two minutes were added per patient when implementing an ACEs screen.

### **Barriers to Screening**

The most frequently identified barrier among providers screening for ACEs was a lack of education on the topic (Gillespie, 2019; Loveday et al., 2022; Popp et al., 2020; SmithBattle et al., 2021). One review discussed the concept of including ACEs education in maintaining certification requirements or performance improvement modules through the AAP (Barnes et al., 2020). That same review also discussed the importance of educating everyone involved, meaning that nurses, medical assistants, and providers should receive education related to screening for ACEs (Barnes et al., 2020). One quality improvement (QI) project adopted the AAP trauma toolkit to create an educational intervention for multidisciplinary providers and included a PowerPoint presentation that had background, definitions, at-risk populations, importance of screening, how to overcome barriers, and next steps (Bryant & VanGraafeiland, 2020). The use of the educational intervention led to increased use of screening tools among participating providers (Bryant & VanGraafeiland, 2020). Due to the increase in discussion around ACEs, one article discusses creating an interprofessional course as a curriculum for healthcare professions (Reed-Ashcraft et al., 2020). Schmitz et al. (2019) referred to the current status of ACEs as a public health crisis and identified a gap in education for pediatric providers that led to the creation of an educational module focusing on ACEs and trauma-informed care (TIC) that increased provider confidence and knowledge. One QI project used a one-to-one provider coaching method to provide education and feedback during the implementation of ACEs

screenings in a pediatric clinic (Crenshaw et al., 2021). Proper training for providers regarding ACEs and TIC is essential for successful ACEs screening (Crenshaw et al., 2021).

Several adversities are included on different screening tools; some of these adversities include exposure to community violence (ECV), economic childhood hardship (ECH), bullying, parental absence, racism/discrimination, caregiver separation/divorce, caregiver incarceration, caregiver substance abuse, caregiver domestic violence, and caregiver mental illness (Popp et al., 2020; SmithBattle et al., 2021). Several studies discuss the impact of toxic stress on the growth and development of children. The adversities on most screening tools are linked to increased levels of toxic stress in children (University, 2021). Constant levels of toxic stress causes unnecessary strain on the brain and body, utilizing the energy needed for typical development (University, 2021). Frequent and prolonged stress from adversities leads to physiological and behavioral disruptions in child health and development (University, 2021). Prolonged toxic stress in children leads to increased risk for mental illness, substance abuse, suicide, diabetes, heart disease, cancer, and obesity throughout their lifespan (Barnes et al., 2020).

There is lack of literature to guide which ACEs to screen for, and there is little evidence to guide interventions for identified ACEs (Loveday et al., 2022). Some providers are concerned that questions about ACEs could come across as intrusive and disrupt the trust and rapport that has been established (Loveday et al., 2022). There are also concerns that screening findings may lead to mandatory reporting to child protection services that could cause further trauma or destroy the relationship with that family unit and the provider (Loveday et al., 2022). One systematic review found that screening for ACEs does improve the identification of adversity (Loveday et al., 2022). However, little evidence exists to identify interventions that have

improved outcomes after these children have been identified as high risk through screening (Campbell, 2020; Loveday et al., 2022). There may be little evidence supporting screening; however, one article found that screening does identify children who could benefit from trauma treatment (Keeshin et al., 2020). Keeshin et al. (2020) identify an important distinction that must be made: screening for ACEs is different from performing a trauma screen; they are similar but have differences and are not done with the same tools.

### **ACEs Screening Tools**

There are several screening tools available for providers to use, but none have emerged superior to another (Popp et al., 2020). There are several parent-reported screening tools for identifying ACEs; many have limitations and have not been validated yet (Barnes et al., 2020). One review recommended that clinicians should consider using the Safe Environments for Every Kid Parent Questionnaire-Revised (SEEK PQ-R), Center for Youth Wellness Adverse Childhood Experiences Questionnaires (CYW-ACEQ), or Well-child Care Visits Evaluation Community Resources Advocacy Referral Education (WE-CARE) screeners to start (Barnes et al., 2020). The Adverse Childhood Experiences (ACEs) screening tool is a validated and accessible tool available for use (Watson, 2019). The ACEs tool has been modified from the adult version for use in the pediatric setting (Watson, 2019). The ACEs tool is comprised of 10 questions to assess for ACEs exposure (Watson, 2019). The California Surgeon General has a new initiative called ACEs Aware to help improve screening efforts to improve lives (Aware, 2022). This initiative uses the Pediatric ACEs and Related Life-events Screener (PEARLS) for children 0-19 years old (Aware, 2022). One randomized control trial utilized PEARLS and found that children with higher PEARLS scores were associated with decreased general health (Thakur et al., 2020). The

PEARLS is a reliable and valid tool that is easy to use in the pediatric primary care setting. The PEARLS tool is available in 17 languages with de-identified and identified screening options (Aware, 2022). It is a 17-item questionnaire that is available for parent/caregiver report and includes an option for child report during adolescent screening (Aware, 2022). This screening tool identifies children at high risk or lower risk for toxic stress and is recommended to be completed annually during well-visits (Aware, 2022). A screening clinical workflow algorithm is available to help make the screening, education, and intervention process as efficient as possible. It is important to remember that these are screening tools to help identify children at risk for toxic stress and who may have experienced or are currently experiencing adversities; these are not case finding, evaluation tools, or diagnostic tools (Keeshin et al., 2020).

### **Trauma-informed Care and ACEs**

One systematic review identified that screening for ACEs is not necessarily about treating trauma but creating a clinical culture that acknowledges the effects of trauma on the body (SmithBattle et al., 2021). Identifying the trauma children are exposed to and addressing their risk for further exposure to trauma can help clinicians provide trauma-informed care and promote resilience in those patients and their families (SmithBattle et al., 2021). Some ACEs are preventable and can be addressed through early intervention services (Barnes et al., 2020). Harvard University identified three principles to help support resiliency in children and families who experience adversity: (1) support responsive relationships, (2) strengthen core skills, and (3) reduce sources of stress (University, 2021). These principles can guide interventions and discussions related to ACEs.

ACEs has been described as an umbrella term encompassing several traumatic experiences that occur in children (Goddard, 2021). One concept mentioned by Goddard (2021) is the presumption that all patients have a history of traumatic stress or experience in some form and care should be nurturing and healing with this in mind. There are four R's to guide pediatric providers in providing trauma-informed care: realize, recognize, respond, and resist re-traumatization (Goddard, 2021). Realizing refers to the understanding of ACEs and their impact on children's growth and development. Recognize refers to identifying the signs of trauma in patients through detailed history collection and thorough assessment. Response refers to taking action within practice through screening, anticipatory guidance, and providing referrals as needed. Resisting re-traumatization is looking to change thought processes and clinical approaches, such as provider education on ACEs and trauma-informed care (Goddard, 2021).

### **Strengths of Evidence**

A strength identified throughout the literature was a significant need for increased evidence-based education related to ACEs and ACEs screening tools (DiGangi & Negriff, 2020; Gillespie, 2019; Jones et al., 2021; Liu et al., 2021). There were various articles included in this review, including systematic reviews, a randomized controlled trial, and several pediatric journal publications that discussed the same major themes surrounding ACEs and the need to address them in the pediatric primary care setting. Another strength in this review was how recent the publications on ACEs screening in pediatric primary care were, with 25 of the articles reviewed published in the last two years, supporting that this is a current concern and issue in practice. Bryant and VanGraafeiland (2020) completed a QI project that utilized an educational intervention for pediatric providers to increase awareness on the ACEs screening tool in the

primary care setting. Crenshaw (2021) completed a QI project implementing ACEs screening into the pediatric primary care setting and found that caregivers were grateful for the discussion and that implementing the screen was feasible for the primary care setting. Liu (2021) also trialed implementation of ACEs screening in the pediatric primary care setting and found it was feasible and widely accepted by providers.

### **Weaknesses of Evidence**

One major weakness identified in this literature review was the lack of clear recommendations for providers. Many authors support screening for ACEs in pediatric primary care, but they offer little information about recommended tools. Loveday et al. (2022) conducted a systematic review on ACEs screening and found only four studies that met the inclusion criteria, which included children aged 0-12 who were screened for adversity, randomized control trials, screening for ACEs and/or screening for social determinants of health, and screening was conducted by a practitioner using a standard set of questions (Jee & Forkey, 2022; Loveday et al., 2022). Several screening tools were identified in the literature search, including the Parent Screening Questionnaire (PSQ), the Children's Healthwatch Survey, the Personal Health Questionnaire Depression Scale, ACEs questionnaire, and the Center for Youth Wellness Adverse Childhood Experiences Questionnaire (Bryant & VanGraafeiland, 2020; Crenshaw et al., 2021; DiGangi & Negriff, 2020; Loveday et al., 2022). Although these were identified in various articles, there is little evidence discussing the validity of these tools. There was a lack of information about the available screening tools throughout the literature; available screening tools were identified, but details on why that tool was chosen or if it accurately identified children with ACEs or at risk for ACEs were not discussed.

## **Gaps and Limitations**

The evidence reviewed supported a need for increased education about ACEs and the importance of screening for ACES in the pediatric primary care setting (Gillespie, 2019). This review of the current literature identified providers' lack of knowledge as the most significant barrier to ACEs screening but does not discuss provider attitudes towards education or a willingness to learn. One QI project in the review of the literature discussed conducting training and guidance on ACEs, talking to patients comfortably, and what to do with the scores via online training, but did not detail the education any further (DiGangi & Negriff, 2020). More information about effective education methods would be beneficial for developing evidence-based educational interventions on ACES screening. There was very little discussion on how to increase provider knowledge about ACEs and screening for ACEs in pediatric primary care in the review of the literature for this DNP project (Figure 1).

## **METHODS**

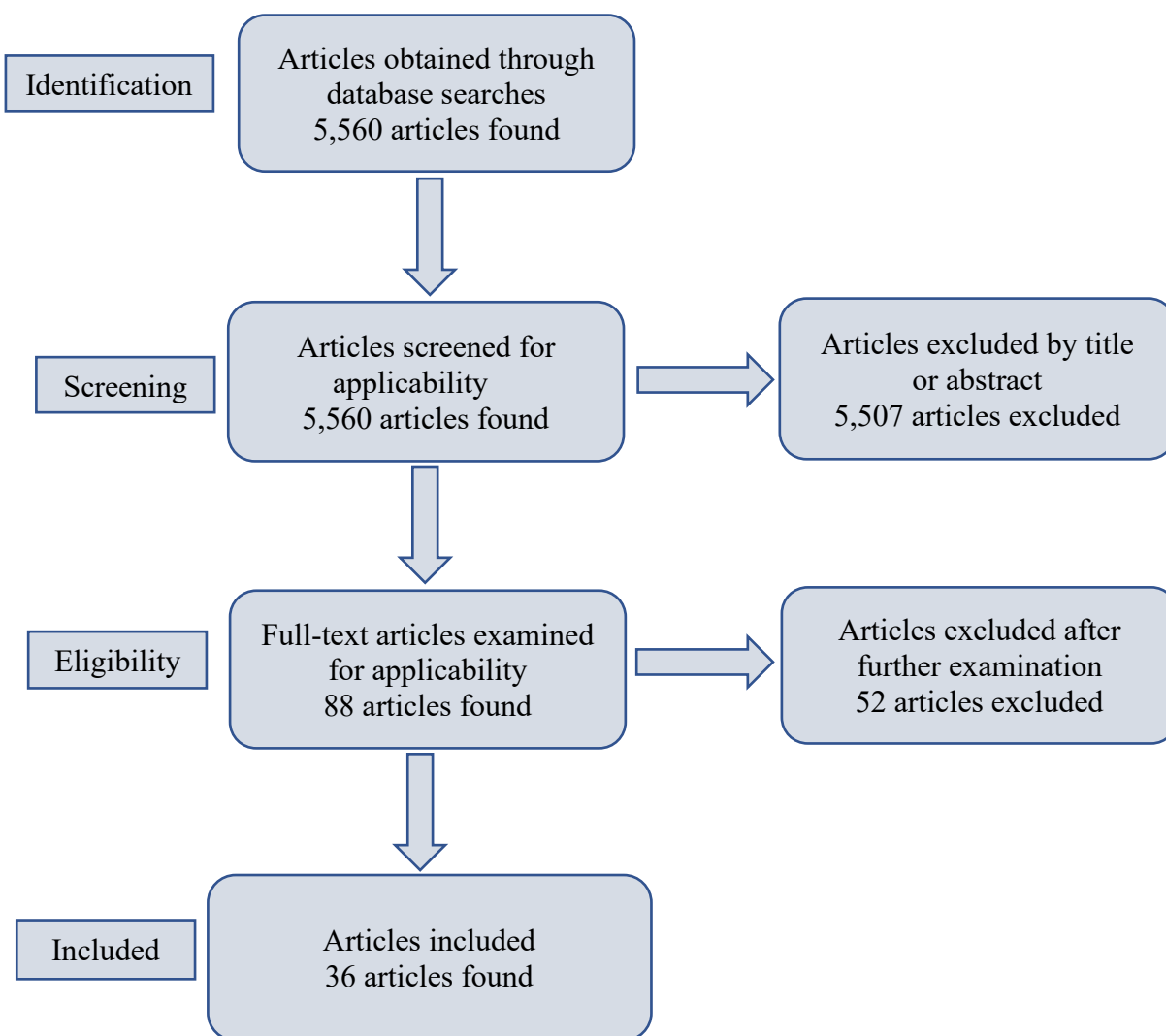
### **Project Design**

This quality improvement (QI) project used a quantitative, one group study design. It was conducted with a convenience sample at West Valley Pediatrics utilizing a pretest, evidence-based educational presentation, posttest, and a follow up survey three weeks later to gain further insight into the participant's perceptions of the QI project. The purpose of this quality improvement (QI) project was to increase provider knowledge through the development and presentation of an evidence-based educational presentation for primary care pediatric providers about ACEs, the associated impact on childhood growth and development, and current evidence-based ACEs screening tools. This project used pre-intervention and post-intervention testing to

determine the effectiveness of the educational intervention. All participants received the same pre-test, educational intervention, post-test, and follow up survey.

**Figure 1**

*Flow Diagram of Evidence Search*



### **Model for Implementation**

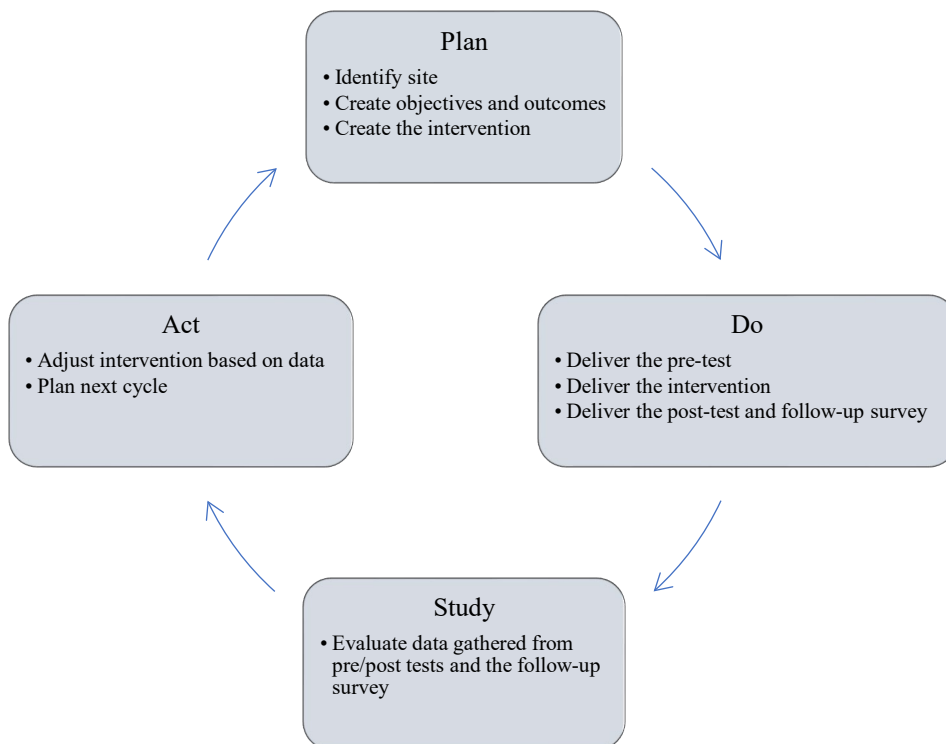
This QI project followed the Plan-Do-Study-Act (PDSA) implementation model. This model has four phases. The planning phase is where the education plan is established and where the learning objectives are created (Wittmann-Price & Gittings, 2021). During the planning phase, the target audience and educator are identified as well as how the education will be delivered and how outcomes will be measured. The next phase is the “do” phase, where the educational intervention is carried out and learner performance is measured according to the predetermined objectives and outcomes (Wittmann-Price & Gittings, 2021). Following that is the “study” phase, where the educational intervention is evaluated based on the learner’s assessments and performance. This is also the phase where learner feedback may be collected to help improve the intervention (Wittmann-Price & Gittings, 2021). The final phase is the “act” phase, where the educator makes adjustments as needed to make the educational intervention more effective based on evaluation during the process (Wittmann-Price & Gittings, 2021). The PDSA implementation model allows for improvement and learner feedback, which is important in this project delivering education to pediatric PCPs.

In this QI project the intervention was the evidence-based education regarding ACEs, the associated impact on childhood growth and development, and current evidence-based ACEs screening tools. The PDSA implementation model guided the creation of the educational intervention, pretests, posttests, survey, and delivery method. The planning phase included creating objectives for the intervention and determining the desired outcomes. The aim of this QI project was to increase provider knowledge about ACEs and the associated screening tools so that providers gained an understanding of the impact on childhood growth and development. The

increased knowledge and awareness may lead to a change in screening practices in pediatric primary care. The second phase was the delivery of the intervention, which began with the pre-test to evaluate current knowledge of ACEs and screening tools. Participants then participated in a web-based educational presentation. Following the presentation, participants took a post-test evaluation to determine if the educational intervention was effective at increasing knowledge. Three weeks following the educational presentation, participants participated in a follow-up survey to gather information about how the intervention was received and any recommendations for improvement. The study phase of the implementation model utilized the information gathered through the pretests and posttests and the follow up survey. This information was valuable because it guided the “act” phase and any modifications that needed to be made to improve effectiveness (Wittmann-Price & Gittings, 2021). The project completed one PDSA cycle and information gained was used to start a plan for the next cycle as needed (Figure 2).

### **Setting and Stakeholders**

The setting for this QI project were the two offices of West Valley Pediatrics located in Buckeye and Avondale, Arizona. These two locations serve large a large population in the west valley of Phoenix, Arizona. According to the United States (US) 2020 census, the population of Buckeye was 91,502 and the population of Avondale was 89,334 (Bureau, 2021). In Buckeye, about 29% of people are under age 18, compared to 28% in Avondale (Bureau, 2021). Both Buckeye and Avondale have about 7% of persons under five years of age (Bureau, 2021). West Valley Pediatrics has two offices and has seven providers that include four physicians and three nurse practitioners. The patient population they serve varies with no predominant class.

**Figure 2***Plan-Do-Study-Act (PDSA) Model*

Stakeholders included the pediatric PCP and the DNP student. One provider was the primary contact for the project implementation and as an owner of the practice provided consent and direction for implementation. He benefitted from the project because it has the potential to improve patient outcomes. The project was low risk for him and his practice because it only required a minimal amount of time and effort. The project was no cost to the practice because it was delivered completely web-based for ease of the DNP student and convenience to the providers. Providers in the practice were the target of the intervention and benefit from the educational intervention to improve practice related to ACEs screening. Providers had the most risk because they had to commit the time and effort to the educational intervention. The

providers participated in the pre-intervention test, the educational intervention, the post-intervention test, and the follow up survey. Other stakeholders include medical assistants and office staff if screening is implemented into the practice because medical assistants will likely deliver and score the screening tool and the office staff will need to scan results into the patient's health record. Patients can also benefit from the intervention by increased knowledge of ACEs and ACEs screening.

### **Planning the Intervention**

Intervention planning began with a literature search and synthesis for evidence to support the intervention. The educational intervention was presented to the project chair and the provider overseeing implementation at the site. The provider provided verbal approval and a written letter of support. A copy of the written letter of support is found in Appendix A.

The next step of planning was the development of the provider education. The creation of education utilized current evidence, CDC, and AAP recommendations. The education was created on a web-based platform to make delivery and participation easy for the DNP student and the participants.

The pre- and post-intervention tests were developed to determine if the intervention is effective at increasing provider knowledge regarding ACEs and ACEs screening. The pre- and post-intervention tests were identical and included 11 questions. The first question was a unique participant identifier for data collection. The remaining 10 questions were knowledge-based covering varying aspects of ACEs and screening for ACEs. A follow up survey was developed and collected qualitative information regarding the participant's perceptions of the educational intervention, recommendations, and perceived barriers for screening for ACEs in their clinic.

The follow up survey consisted of seven questions; the first five were quantitative and the last two were open-ended for qualitative data collection. The pre- and post-intervention tests were modeled after similar QI projects and adapted for use in this project. No demographics were collected on the pretests, posttests or the follow up survey. The proposed QI project was submitted to the Institutional Review Board (IRB) at the University of Arizona. After approval was received, formal implementation within West Valley Pediatrics began.

The participant education was based on the recommendations from the CDC, AAP, and evidence from the literature search. A current initiative in California, *ACEs Aware*, and two similar QI projects about ACEs were also used as models for creating provider education. The PEARLS screening tool was used as an example in the education of an available, validated screening tool available to pediatric primary care providers. The goal of the education was to consolidate and simplify information about ACEs and ACEs screening to allow the participant a brief overview of the significance of ACEs and the importance of implementing ACEs screening. Participants remain able to access to the education after the project's completion since it is web-based.

The educational intervention along with the pre- and post-intervention tests were delivered to the participants in an email with one link to begin participation. The link directed participants through all aspects of the project. The participants received the email containing the link at the same time and had two weeks to complete the intervention. Three weeks from the end date of the project, another email was sent containing the link to the follow up survey.

Participants had one week to complete the follow up survey. Once all participants were educated

and the follow up surveys were completed, the implementation phase of the project was considered complete.

### **Participants and Recruitment**

West Valley Pediatrics has two offices and has seven providers that include four physicians and three nurse practitioners. All providers were eligible to participate in the DNP project. English is the primary language of all participants, so all educational materials were in English. The DNP student met with three of the four owner/providers of the practice and discussed participation in the project, and each agreed. The recruitment of the other providers was done via email at the beginning of implementation. The email contained a brief introduction to the project and the link for the intervention. By clicking on the link, providers agreed to participate in the intervention and data collection. Only providers in the practice received the email. See Appendix B for the email script.

### **Consent and Ethical Considerations**

Ethical considerations must always be evaluated when working with people during quality improvement (QI) initiatives. Ethical demands can sometimes be in conflict with the production of quality evidence (Polit & Beck, 2017). Any time humans are used as study participants, caution must be taken to protect their rights (Polit & Beck, 2017). The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research created the Belmont Report to serve as a basis for research regulations (Polit & Beck, 2017). There are three principles included in the Belmont Report that provide standards for ethical conduct in research and those are beneficence, respect for human dignity, and justice (Polit & Beck, 2017).

**Beneficence**

Beneficence is defined as minimizing harm and maximizing benefit in human research. This means that participants should not be exposed to any unnecessary risks of harm which can be physical, emotional, or financial (Polit & Beck, 2017). Beneficence for this DNP project was maintained by informing participants that participation was voluntary, refusal would not carry any consequences, and that there were no risks associated with participation in the DNP project.

**Respect for Human Dignity**

Respect for human dignity is the participants right to self-determination and the right to full disclosure (Polit & Beck, 2017). Full disclosure is providing participants with a complete description of the study including risks and benefits, the participant's right to consent or refuse, and the researcher's responsibilities (Polit & Beck, 2017). Respect for human dignity for this DNP project was maintained by receiving Internal Review Board (IRB) approval prior to participant recruitment and by providing participants with complete disclosure within the recruitment email.

**Justice**

The third principle is justice and that includes the participants' right to fair treatment and their right to privacy through the duration of the study (Polit & Beck, 2017). Justice for this DNP project was maintained by anonymous participation. Participants also received identical materials to maintain equality and fairness and to preserve the integrity of the data.

A crucial aspect to protecting participants is the collection of informed consent (Polit & Beck, 2017). Informed consent involves communicating the participant status and the data they will provide for the project (Polit & Beck, 2017). The goals of the study should be clearly

communicated in lay and not in technical medical terms (Polit & Beck, 2017). Potential risks and potential benefits must be disclosed to the participants so they can determine if participation is right for them individually (Polit & Beck, 2017). Participants must be aware of the confidentiality practices and the right to withdraw at any time during the study (Polit & Beck, 2017). One important aspect of informed consent is that participants understand consent and participation is voluntary and they are in no way obligated to consent or participate in research and will not result in any penalty or loss (Polit & Beck, 2017).

### **Data Collection**

The data was collected from the answers to the pre- and post- intervention questionnaires and the follow up survey. The questionnaires and follow-up survey were developed by the DNP student and then reviewed by two content experts. The content experts included one experienced nurse educator/researcher and one doctorally-prepared psychiatric mental health nurse practitioner with experience with ACEs screening. The content experts provided feedback per email and the feedback from the content experts was incorporated in both the pre- and post-tests and the formatting of the presentation. Based on feedback from both content experts, the content for the educational presentation was unchanged but the formatting of the presentation was changed to be more visually engaging for the participants. One content expert (CE1) offered suggestions for removing multiple-choice questions that offered an “all of the above” option and instead using select all that apply questions with some correct choices and some incorrect choices. These suggestions were incorporated and multiple-choice questions with “all of the above” as an option were adjusted to only have a single correct answer. The content expert (CE1) also offered suggestions to expand the wording of questions to be more specific and

clearer. The second content expert (CE2) offered wording suggestions for the open-ended questions on the follow-up survey to make the questions more specific to the implementation site and not as broad, such as adding “in your practice” when asking about barriers to screening for ACEs. The second content expert (CE2) also recommended adding citations throughout the educational presentation to strengthen the content. Citations were added in response to these recommendations.

Questionnaires were completed via Microsoft Forms through email delivery. Questionnaires did not include any identifying information of the participant or the clinic. The pre- and post-intervention questionnaires were identical and contained 10 knowledge-based questions. Questions included multiple choice, true/false, Likert scale, and select all that apply. The questions were designed to evaluate participant knowledge regarding ACEs and ACEs screening. The questionnaires collected ordinal, continuous, and categorical data. Ordinal data is collected based on ordered criterion and can provide relative rank (Polit & Beck, 2017). Continuous data has values along a continuum, for example, weight provides continuous data (Polit & Beck, 2017). Categorical data is represented by multiple choice questions where there is a set number of options or categories (Polit & Beck, 2017). Each participant created a unique number or word to enter on the pre- and post-intervention questionnaire to link their scores. Questionnaire responses were not paired with responses from the follow up survey. Pairing the responses was not necessary because the follow up survey provided insight and perception of the educational intervention and did not convey a change in participant knowledge. The follow up survey collected categorical data from open-ended questions and yes/no questions. Ordinal data was collected using a Likert scale. The follow up survey consisted of one yes/no question

inquiring if ACEs screening had been implemented since completing the educational intervention. There were three Likert scale questions inquiring about a likelihood of implementing ACEs screening, an increase in knowledge following the education, and a change in perception regarding ACEs. The last two questions were open-ended asking about barriers to implementing ACEs screening and recommendations for further education on ACEs.

Questionnaires were linked to a private Microsoft account that only the DNP student has access to through the University of Arizona dual authentication protected account. Data was exported from Microsoft Forms and downloaded on a secure, password protected USB drive in the DNP student's possession. Once all data was collected and exported from Microsoft Forms, the questionnaires were deleted. All downloaded electronic data was transferred to the University of Arizona College of Nursing's cloud database, where it will be securely stored for six years.

### **Data Analysis**

No identifying information was collected from participants for this DNP project. Analysis of the data was conducted via descriptive statistics and a paired t-test of the pre-test and post-test responses. Paired t-test is used to compare two means that are from the same individual, object, or related units (Polit & Beck, 2017). Using the paired t-test, a determination can be made whether there is statistical evidence that the mean difference between paired observations on a specific outcome is significantly different from zero (Polit & Beck, 2017). The paired t-test assisted in determining whether the findings on the pre-test and post-test were statistically significant. The statistical analysis was utilized to measure participant's knowledge on ACEs and ACEs screening in the pediatric primary care setting before and after the educational intervention.

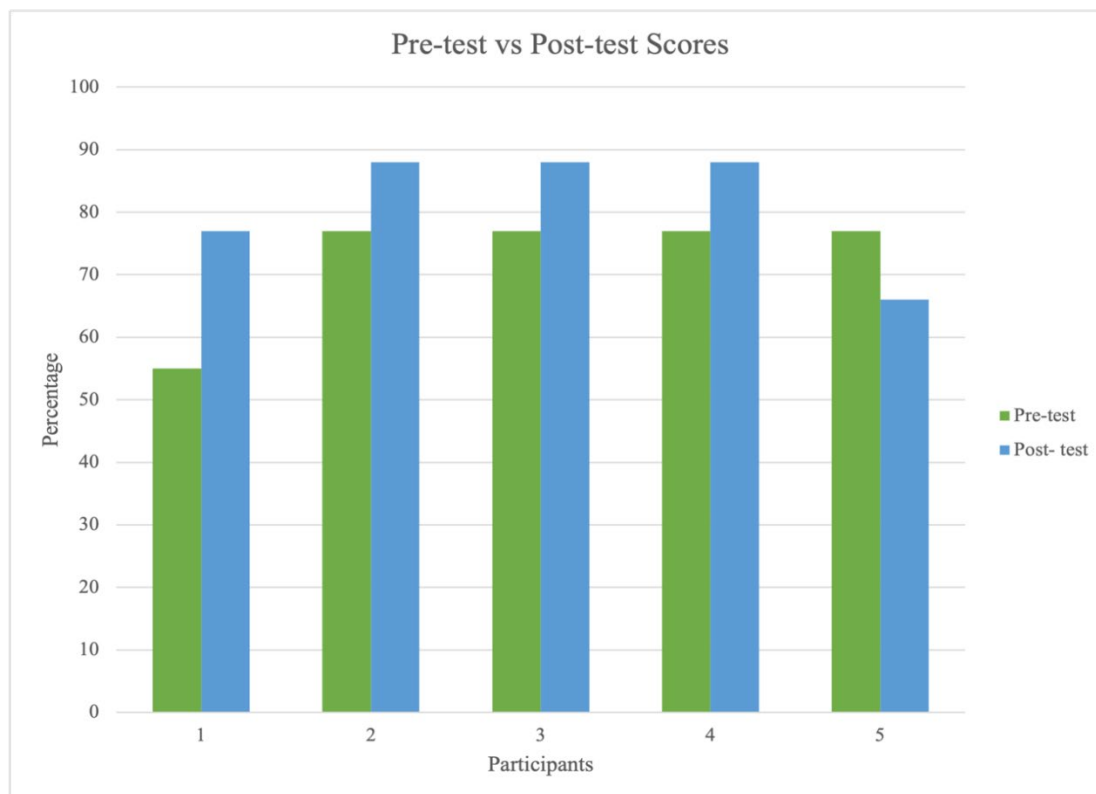
The follow up survey was completed by participants three weeks after the educational presentation was completed. The data collected from this survey was evaluated based on a) the number of 'yes' and 'no' responses on the one 'yes' or 'no' question, b) the frequency of responses to the three Likert scale questions, and c) emerging themes of the two open-ended questions.

## **RESULTS**

### **Outcomes**

Participants at West Valley Pediatrics, both physicians and nurse practitioners, completed an identical pre- and post-test regarding knowledge of ACEs and ACEs screening in pediatric primary care. Seven pediatric primary care providers were invited to participate and of those, there were a total of 5 participants (n=5) who consented and completed this DNP project. Participants remained anonymous but their pre- and post-test scores were linked using a unique participant identifier chosen by the participant.

Participant completion of the pre- and post-tests revealed an average score of 73% with a median of 77% on the pre-test and an average score of 81% with a median of 88% on the post-test (Table 2). Results show that all but one participant had an increased score from the pre-test to the post-test (Figure 3). The pre-test had an average completion time of 2 minutes and 45 seconds. Participants spent an average of 4 minutes reviewing the educational intervention. The post-test had an average completion time of 56 seconds.

**Figure 3***Pretest and Posttest Scores (n=5)***Table 2***Descriptive Statistics of the Pretest and Posttest Participant Scores (n=5)*

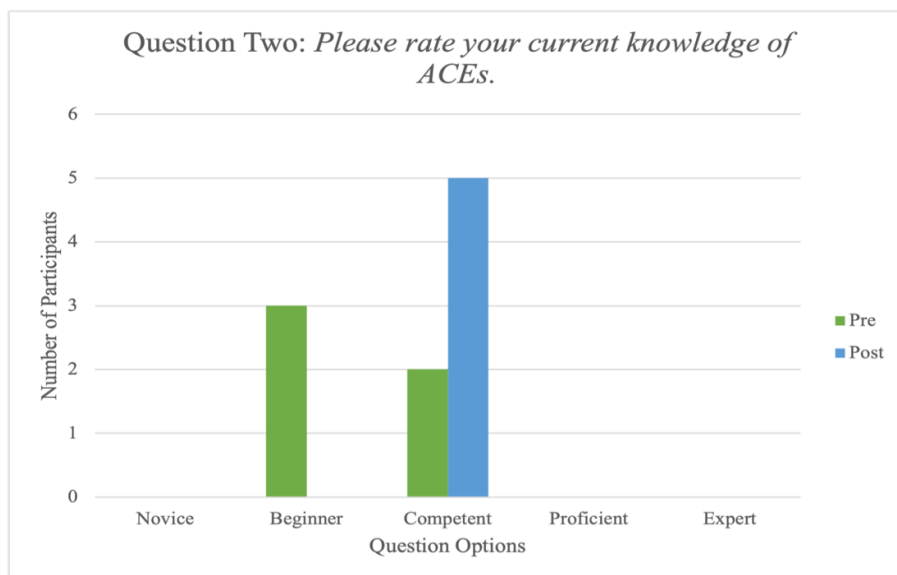
<i>Statistics</i>	<i>Pretest (%)</i>	<i>Posttest (%)</i>
<i>Mean</i>	73	81
<i>Median</i>	77	88
<i>Minimum</i>	55	66
<i>Maximum</i>	77	88

The first question on the pre- and post-test asked participants to enter a unique participant identifier, and questions 2-11 pertained to their knowledge of ACEs. No demographic information was collected on participants. The second question asked participants to rate their

current knowledge of ACEs with the choices of novice, beginner, competent, proficient, and expert. Of those choices, 60% of participants rated themselves as beginners and 40% as competent on the pre-test. On the post-test, 100% of participants rated themselves as competent (Figure 4).

**Figure 4**

*Question 2: Pretest and Posttest*

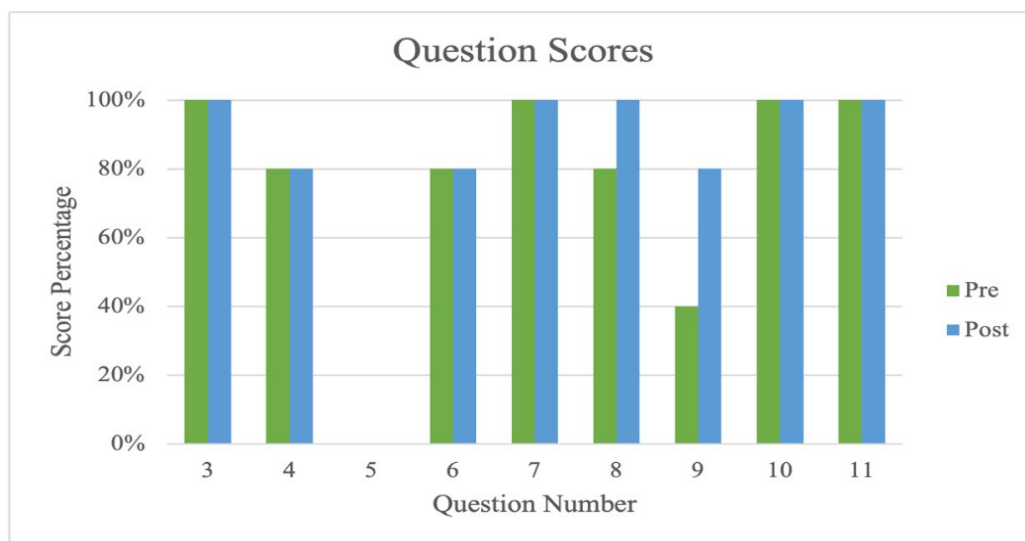


Question 3 was a multiple-choice question that asked participants to identify the definition of ACEs, and all participants answered this correctly on the pre-test and the post-test. Question 4 was a select all that apply question that was answered correctly by 80% of participants on the pre-test and the post-test. Question 5 was a select all that apply question that identified adult conditions that are associated with increased risk due to ACEs. Question 5 was missed by all participants on both the pre and post-test. Options included, asthma, diabetes, stroke, risky behaviors (teen pregnancy, STIs, smoking), and disabilities. Of these, all were correct except disabilities. Question 6 was another select all that apply question that asked

participants to identify experiences that are classified as ACEs and was answered correctly by 80% of participants on both the pre- and post-test. Questions 7, 8, 10, and 11 were true/false questions regarding ACEs knowledge. Questions 7, 10, and 11 were answered correctly by 100% of participants on the pre- and post-test. Question 8 asked if financial hardship is considered an ACE and was answered correctly by 80% of the participants on the pre-test and by 100% of participants on the post-test. Question 9 was a multiple-choice question that addressed the incidence of ACEs; this was answered correctly by 40% of participants on the pre-test and by 80% of participants on the post-test. See Figure 5 for the performance of each question.

**Figure 5**

*Question Performance*



The paired t-test analysis demonstrated the educational intervention did not significantly increase pediatric primary care provider's knowledge of ACEs and ACEs screening. Participant scores increased by 8.8% from the pre-test to the post-test after viewing the educational intervention. A p value of <math><0.05</math> is considered statistically significant because that means there is

less than a 5% probability that there is no difference between results (Polit & Beck, 2017). The paired t-test had a p value of 0.17, which was not statistically significant (Table 3). Due to the small number of participants a risk for a type II error is likely, i.e., saying no statistical difference is present when one may exist. It should be noted that one participant scored lower on the post-test than on the pre-test based on their answer to question number 6 and this cannot be explained.

**Table 3**

*Descriptive Statistics of Paired t-Test*

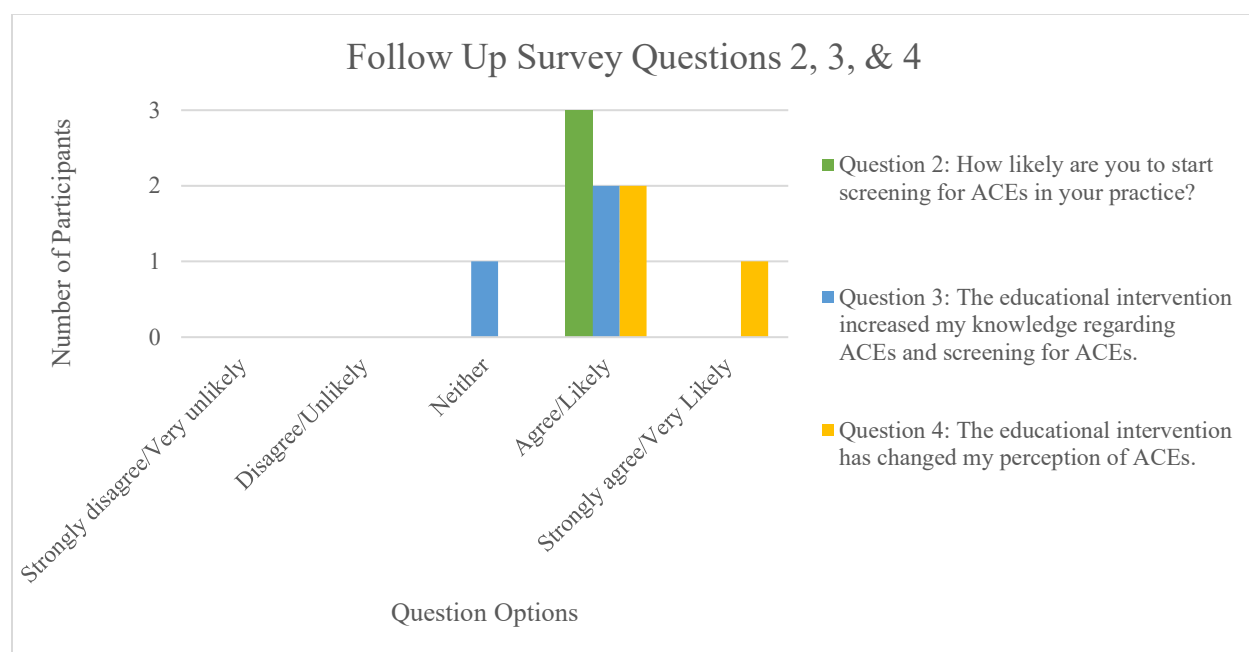
<i>Pretest</i>		<i>Posttest</i>		n	t	Sig. (2-tailed)
M	SD	M	SD			
73	0.098	81	0.098	5	1.632993	0.177

To gain more insight, participants were invited to complete a follow up survey three weeks after the educational intervention was delivered. The follow up survey responses were not linked to the pre- and post-test scores. A total of three out of the original five participants completed the follow up survey (n=3). The follow up survey was comprised of six questions. The first question asked participants if they have started screening for ACEs since completing the educational intervention, with one answering yes and two answering no (Figure 6). Questions 2, 3, and 4 were answered with a Likert scale and asked participants about an increase in knowledge and any change in practice regarding ACEs screening as demonstrated in Figures 7 and 8. Question 2 asked “*How likely are you to start screening for ACEs in your practice?*” and all three participants selected “Likely.” Question 3 asked *the educational intervention increased my knowledge regarding ACEs and screening for ACEs*, and one participant selected “Neither” and two selected “Agree.” Question 4 asked *the educational intervention changed my perception of ACEs*, and two participants selected “Agree” and one selected “Strongly Agree.” The final two

questions in the follow up survey were open-ended questions. Open-ended questions allow participants to provide a more elaborate perspective and the freedom to respond in their own words (Polit & Beck, 2017). The first open-ended question, question 5, asked about any barriers to screening for ACEs in their practice. Two participants answered time constraints and another discussed lack of specific resources available for screening. The second open-ended question, question 6, asked for recommendations for further education and two participants stated “none,” and the other wrote “add a few directed questions that would cover ACEs into our well check templates.”

**Figure 6**

*Follow Up Survey Questions 2, 3, and 4*



## **DISCUSSION**

### **Summary**

There are a multitude of adverse health outcomes associated with ACEs. Around 61% of adults reported experiencing at least one ACE (DiGangi & Negriff, 2020). With so many children at risk for ACEs, pediatric primary care providers are in the optimal position to identify these children and provide intervention when necessary. Well visits provide an opportunity to screen for many health conditions and risk factors that impact a child's growth and development. The AAP and NAPNAP have both released policy statements discussing the role of the pediatric primary care provider in recognizing and identifying ACEs through routine screenings. Evidence gained from the literature synthesis for this project identified that pediatric primary care providers are lacking education and knowledge about ACEs and their role in screening for ACEs.

The purpose of this DNP project was to develop an evidence-based educational intervention for pediatric primary care providers to increase their knowledge of ACEs and screening for ACEs in the pediatric primary care setting. This DNP project adds pertinent information to current literature about implementing effective education for providers regarding ACEs and screening for ACEs. The intended aims for this DNP project were achieved as evidenced by the increase in post-test scores compared to the pre-test scores, even though the paired test results were not statistically significant. The evidence-based educational intervention developed for this DNP project also demonstrated efficient and concise information evidenced by the times participants took to complete the educational module, pre-test, and post-test.

### **Interpretation**

The findings of this DNP project show that many participants had some knowledge of ACEs and ACEs screening prior to the implementation of the intervention. Three participants chose their level of knowledge of ACEs as beginners and two chose their level of knowledge of ACEs as competent prior to the intervention. Following the intervention, all participants rated their current knowledge of ACEs as competent. Some of the questions performed the same on both the pre and post-test. For example, question 5 performed poorly on both the pre-and post-test which could mean the question was poorly written and did not capture the data it was intended to. Since question 5, was missed by all participants on the pre and post-test and it would need further evaluation and adjustment before being used again. The choice to use select all that apply questions, such as questions 4, 5, and 6, may not have been the best option for evaluating knowledge because participants had to correctly identify all aspects of the question for it to be counted as correct. The multiple choice and true/false, questions 3, 7, 8, 9, 10, 11, performed better and could have been used in place of the select all that apply.

Only 3 out of 5 (60%) participants completed the follow up survey and 2 out of 3 (67%) stated they had not started screening for ACEs since completing the educational intervention. However, all three participants (100%) responded they were likely or very likely to begin screening for ACEs. Lack of time has previously been identified as the most significant barrier to implementing ACEs screening in pediatric primary care and, that was noted by two participants (67%) in the follow up survey.

Participants all stated that the educational intervention was effective, and it even changed the perception of ACEs for two participants (67%) that completed the follow up survey. Despite

the small sample size, this DNP project demonstrated a positive impact with an increase in the pre- and post-test scores following the evidence-based education on ACEs and screening for ACEs in pediatric primary care, even though that increase was not found to be statistically significant. Participants on the follow up survey reported a self-perceived increase in knowledge and reported they were likely to start screening for ACEs in their practice following completion of the educational intervention.

### **Implications**

#### **Practice**

Pediatric primary care providers at West Valley Pediatrics demonstrated an interest in increasing their knowledge of ACEs and screening for ACEs in primary care. This interest demonstrated a willingness to learn. After completion of the evidence-based educational intervention, participants had an increase in knowledge. This increase in knowledge paired with their interest in ACEs can lead to further practice change with the goal of formally screening for ACEs in pediatric primary care.

#### **Education**

After reviewing the results and completing one PDSA cycle, this QI project could be adjusted and implemented on a larger scale. Some modifications would need to be made to the questionnaires where questions performed poorly, but the delivery system and evidence-based educational intervention proved effective at increasing provider knowledge, even though the data analysis did not find that increase was not statistically significant. This was the first time an evidence-based educational presentation on ACEs and screening for ACEs in pediatric primary care was implemented with original pre- and post-tests to measure an increase in knowledge. The

evidence-based education proved to be effective at increasing participant knowledge of ACEs and screening for ACEs in the primary care setting. From the thorough literature synthesis, a common theme emerged among pediatric primary care providers, a lack of knowledge of ACEs and ACEs screening, and this DNP project took the first step in addressing that knowledge gap and showed promise for future use.

### **Research**

The results of this DNP project provide evidence to support the American Academy of Pediatrics and the National Association of Pediatric Nurse Practitioners recommendations to implement ACEs screening in well child visits in pediatric primary care settings. However, provider education must be the starting point before practice changes can be implemented successfully with ACEs screening (Jones et al., 2021; Reed-Ashcraft et al., 2020; Schmitz et al., 2019). This DNP project took the first step in provider education by creating an evidenced-based educational presentation about ACEs and screening for ACEs with corresponding pre and post-tests. This DNP project contributed to the body of literature for this topic, but further research is still needed.

### **Policy**

This QI project could be adopted by larger organizations and offered to pediatric primary care providers as a continuing medical education credit. This evidence-based education could benefit many roles including nursing students, medical assistants, advanced practice nurses, physician assistants, and physicians. Participants at West Valley Pediatrics have stated they will start asking ACEs screening questions as part of their well child checks which could lead to more formal screening in the future. The AAP and NAPNAP have released recommendations that

ACEs screening should be completed in pediatric primary care settings as a part of routine preventive care and this DNP project provides support for those recommendations.

### **Integration of Theoretical Framework**

The ALT was an effective theoretical framework for this project as it is especially helpful in creating educational content for healthcare professionals. Having the ALT as a foundation for this educational intervention allowed the principal investigator (PI) to effectively transfer knowledge gained through research to participants with the Andragogical Approach as a guide.

### **Strengths**

This DNP project took the first step in addressing a knowledge gap amongst pediatric primary care providers regarding ACEs and ACEs screening in pediatric primary care. The use of current evidence-based practice and a literature synthesis strengthened this project. Another strength of this DNP project was the use of a theoretical framework to guide the development and implementation of the educational intervention. The use of methodological framework for data analysis was also a strength for this DNP project.

### **Limitations**

One of the limitations for this DNP project was the use of a convenience sample. A convenience sample can be problematic because participants may be atypical from the population (Polit & Beck, 2017). There may also be bias with a convenience sample because participants select themselves as volunteers (Polit & Beck, 2017). Another limitation was the small sample size. West Valley Pediatrics only had a total of 7 providers in their practice, of those, only 5 participated. A larger sample size may have demonstrated a statistical significance with the effectiveness of the educational intervention. Another possible limitation was the timing

of the intervention. The intervention was delivered during the summer when many of the participants had scheduled vacations coinciding with summer break for their families. The timing in combination with the limited two-week window for completion of the intervention may have contributed to not all providers participating.

This QI project did not collect demographic information from participants, which could have been beneficial. Collecting information such as years of practice may have provided more insight into participants' perceptions of the intervention and willingness to change practice following the intervention. Asking participants about prior education or training about ACEs and ACEs screening may have also been beneficial for this project.

The pre-test, post-test, and evidence-based educational intervention were evaluated by two content experts with backgrounds in professional education and they agreed with the teaching material and the evaluation methods. The use of identical pre- and post-tests can impact results since participants are exposed to the questions on the pre-test, and this can impact their post-test results (Polit & Beck, 2017). There may have been bias in recruitment technique of the convenience sampling from one site because the PI was a clinical student at West Valley Pediatrics, which may have made participants feel an obligation to participate.

### **DNP Essentials Addressed**

This DNP project aligned with the DNP Essential I: Scientific Underpinnings for Practice and DNP Essential II: Organizational and Systems Leadership for Quality Improvement.

#### **DNP Essential I: Scientific Underpinnings for Practice**

DNP Essential I helps advanced practice nurses utilize nursing science to evaluate current practices in healthcare and propose evidence-based interventions to improve patient outcomes

(Zaccagnini & White, 2017). This DNP project utilized DNP Essential 1 by the review of the literature on ACEs and ACEs screening. DNP Essential 1 was also addressed in this DNP project by the use and application of a theoretical framework to guide the development and implementation of the evidence-based intervention.

### **DNP Essential II: Organizational and Systems Leadership for Quality Improvement**

DNP Essential II guides the advanced practice nurse through the development and analysis of quality improvement initiatives to address current and future healthcare issues (Zaccagnini & White, 2017). DNP Essential II was utilized in this DNP project by the development, implementation and analysis of data obtained by the pre-test, post-test, and follow-up survey on ACEs and ACEs screening.

### **Conclusions**

This DNP QI project aimed to deliver a web-based evidence-based educational intervention to pediatric primary care providers at West Valley Pediatrics. Pediatric primary care providers have a critical role in monitoring the growth, development, and overall wellness of children. ACEs can dramatically impact the overall well-being of children and put them at increased risk for adverse health outcomes into adulthood. Early identification and intervention with children experiencing ACEs can improve the long-term outcomes of these children. Providers must be aware of ACEs and their impact on development and health as well as the screening tools available to help identify children at risk. Provider education is the first step to addressing ACEs in pediatric primary care. This project demonstrated that with education, the participants had an increased knowledge of ACEs and screening for ACEs, and the follow-up

survey found that the participants stated they were more likely to start screening in their clinical practice.

### **Plan for Sustainability**

Providers at West Valley Pediatrics will have continued access to the education through the link provided for participation and may be shared with new hires to the practice if they wish. This educational intervention could benefit several roles including nursing students, medical assistants, advanced practice nurses, physician assistants, and physicians at West Valley Pediatrics. Participants would need continued access to the internet and a computer to view the educational intervention. Since this educational intervention was delivered in a web-based format, it can be easily implemented at other pediatric sites in Arizona.

Another way to increase sustainability for this DNP project is a recommendation that this QI project be adapted for use as a CME for all pediatric primary care providers to access. To reach a larger group of pediatric primary care providers, this evidence-based educational intervention could be made available to the local American Academy of Pediatrics (AAP) and National Association of Pediatric Nurse Practitioners (NAPNAP) chapters for CME credit or as an available resource for those interested in furthering their knowledge of ACEs and ACEs screening

### **Plan for Dissemination**

An executive summary of this DNP project was provided to West Valley Pediatrics. The evidence-based educational intervention used in this project has the potential to be utilized in a variety of settings by many pediatric primary care roles. The abstract for this DNP project will be submitted to the local NAPNAP chapter for possible presentation at the next meeting.

This DNP project took the first major step toward addressing among pediatric primary care providers knowledge regarding ACEs and screening for ACEs. The data and results from this project contribute to the body of evidence supporting provider education about ACEs and demonstrated efficacy in increasing knowledge among participants. This DNP project offers a useful tool to primary care sites interested in increasing knowledge of ACEs and screening for ACEs and provides a starting point to further awareness of ACEs.

APPENDIX A:  
SITE APPROVAL/THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD  
AUTHORIZATION LETTER

**West Valley Pediatrics**  
10750 W McDowell Road  
Suite G-700  
Avondale, Arizona 85392

May 18, 2022

Human Subjects Protection Program  
The University of Arizona  
845 N Park Ave., Suite 537A  
Tucson, AZ 85719

Please note that Ms. Sonora Robison, University of Arizona Doctor of Nursing Practice student, has permission of the West Valley Pediatrics Office to conduct a quality improvement project at our facility for her project, "Increasing Provider Knowledge of Adverse Childhood Experiences Screening in Pediatric Primary Care."

Ms. Robison will provide a web-based educational intervention to primary care providers at West Valley Pediatrics about adverse childhood experiences (ACEs) and screening for ACEs. The providers will be given a pre- and post-intervention questionnaire at the time of the education, and then a follow-up survey three weeks following the completion of the educational intervention. Providers will be recruited via email. In the recruitment email, she will provide a description of the project, what they will be asked to do, and the estimated time involved. Ms. Robison's activities will be completed by December 15<sup>th</sup>, 2022.

Ms. Robison has agreed to provide to my office a copy of the University of Arizona Determination before she recruits participants. She will also present aggregate results to the participating providers if requested at the conclusion of her project.

If there are any questions, please contact me by email at [gberubitsky@me.com](mailto:gberubitsky@me.com) or by phone at 602-403-8673.

Signed,

  
West Valley Pediatrics Owner



University of Arizona IRB  
 845 N Park Ave., Suite 537A  
 Tucson, AZ 85719  
 Fax: 520-621-9810  
[VPR-IRB@arizona.edu](mailto:VPR-IRB@arizona.edu)

NOT HUMAN RESEARCH

June 22, 2022

Sonora Robison

Dear Sonora Robison:

On 6/22/2022, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title:	Increasing Provider Knowledge of Adverse Childhood Experiences Screening in Pediatric Primary Care
Investigator:	Sonora Robison
IRB Submission ID:	STUDY00001489
Sponsor:	None
Prime Sponsor:	None
IND, IDE, or HDE:	None
Documents Reviewed:	<ul style="list-style-type: none"> <li>• 922 Robison Disclosure .doc, Category: Consent Form;</li> <li>• ACEs DNP Project Pretest FINAL w_Disclosure.pdf, Category: Data Collection Tool;</li> <li>• Advisor Attestation.pdf, Category: Institutional Approval;</li> <li>• DNP Recruitment Email.docx, Category: Recruitment Materials;</li> <li>• Follow Up Survey Email.docx, Category: Recruitment Materials;</li> <li>• Follow Up Survey FINAL.pdf, Category: Data Collection Tool;</li> <li>• Post Test FINAL.pdf, Category: Data Collection Tool;</li> <li>• Robison IRB Application.docx, Category: IRB Protocol;</li> <li>• signed site authorization .pdf, Category: External Site Authorization;</li> <li>• Sway PDF.pdf, Category: Participant Material;</li> </ul>





THE UNIVERSITY OF ARIZONA  
**Research**  
Innovation & Impact

University of Arizona IRB  
845 N Park Ave., Suite 537A  
Tucson, AZ 85719  
Fax: 520-621-9810  
[VPR-IRB@arizona.edu](mailto:VPR-IRB@arizona.edu)

The IRB determined that the proposed activity is not research involving human subjects as defined by DHHS and FDA regulations.

IRB review and approval by this organization is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities are research involving humans in which the organization is engaged, please submit a new request to the IRB for a determination. You can create a modification by clicking **Create Modification / CR** within the study.

All Covered Individuals must disclose all sponsored and non-sponsored Research Projects to the Office for Responsible Outside Interests (OROI) prior to Conducting Research if the individual is an Investigator. Please visit the [OROI](#) website for more information.

We value your feedback and would appreciate you taking the time to complete our survey about your experience with the IRB staff:

[https://uarizona.co1.qualtrics.com/jfe/form/SV\\_dgQSVxqciPhiiUd](https://uarizona.co1.qualtrics.com/jfe/form/SV_dgQSVxqciPhiiUd).

If questions arise at any time during your study, please email the general IRB inbox at [VPR-IRB@arizona.edu](mailto:VPR-IRB@arizona.edu).



APPENDIX B:  
CONSENT DOCUMENT (DISCLOSURE AND CONSENT FORM)

## **Increasing Provider Knowledge of Adverse Childhood Experiences Screening in Pediatric**

### **Primary Care**

#### **Sonora Robison**

The purpose of this project is to develop and present an evidence-based educational presentation for primary care pediatric providers about ACEs, the associated impact on childhood growth and development, and current evidence-based ACEs screening tools at West Valley Pediatrics.

If you choose to take part in this project, you will be asked to complete a pre-intervention questionnaire, view the educational presentation, complete a post-intervention questionnaire, and complete a follow-up survey three weeks later. It will take approximately 20 minutes to complete all the initial components and another estimated 5 minutes for the follow-up survey. There are no foreseeable risks associated with participating in this project. You will receive no immediate benefit from your participation. Your responses are anonymous. Your name will not be collected or linked to your answers.

If you choose to participate in the project, participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw at any time from the project. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project.

For questions, concerns, or complaints about the project, you may call or email Sonora Robison, BSN, RN, DNP-PNP Student, The University of Arizona, at 928-713-7689 or [sonorarobison@email.arizona.edu](mailto:sonorarobison@email.arizona.edu).

You agree to have your responses used for this project.

APPENDIX C:  
RECRUITMENT MATERIAL (RECRUITMENT EMAIL)

Hello, my name is Sonora Robison, and I am a DNP student in the Pediatric Nurse Practitioner specialty. West Valley Pediatrics has agreed to be the implementation site for my DNP project. The purpose of this project is to develop and present an evidence-based educational presentation for primary care pediatric providers about ACEs, the associated impact on childhood growth and development, and current evidence-based ACEs screening tools at West Valley Pediatrics.

If you choose to take part in this project, you will be asked to complete a pre-intervention questionnaire, view the educational presentation, complete a post-intervention questionnaire, and complete a follow-up survey three weeks later. All components are web-based and can be completed at your convenience. It will take approximately 20 minutes to complete all the initial components and another estimated 5 minutes for the follow-up survey. Your responses are anonymous. Your name will not be collected or linked to your answers.

The link below will take you to the project. By clicking the link, you are consenting to participating for this project. Participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw at any time from the project. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project.

For questions, concerns, or complaints about the project, you may call or email Sonora Robison, BSN, RN, DNP-PNP Student, The University of Arizona, at 928-713-7689 or [sonorarobison@email.arizona.edu](mailto:sonorarobison@email.arizona.edu).

Thank you for your time and I hope you enjoy the educational presentation.

Sincerely,  
Sonora Robison  
BSN, RN, DNP-PNP Student  
[sonorarobison@email.arizona.edu](mailto:sonorarobison@email.arizona.edu)

APPENDIX D:  
EVALUATION INSTRUMENTS (ACES DNP PROJECT PRETEST/POSTTEST/FOLLOW  
UP SURVEY)

# ACEs DNP Project Pretest

By beginning this anonymous educational intervention you are consenting to participating in this DNP project and allow the data to be utilized for the purposes of this project.

\* Required

1. Please enter a unique word or number that will be used as your participant ID. You will need this for your post-test. \*

2. Please answer the following \*

	Novice	Beginner	Competent	Proficient	Expert
Please rate your current knowledge of ACEs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Adverse childhood experiences (ACEs) are defined as: \*

- Negative or potentially traumatic events, occurring at any age which negatively impact health
- Potentially traumatic childhood events occurring between the ages of 0-17 that can negatively impact lifelong health and well-being
- Childhood experiences which lead to mental illness and substance abuse during teenage years
- Experiences of children living in foster care

4. Toxic stress is a result of ACEs exposure and can negatively impact (mark all that apply) \*

- Brain development
- Immune System
- Ability to form stable relationships
- Finances and jobs
- Learning
- Decision making

5. Which conditions in adulthood are associated with an increased risk due to ACEs? \*

- Asthma
- Diabetes
- Stroke
- Risky behaviors (teen pregnancy, STIs, smoking)
- Disabilities

6. ACEs include experiencing \*

- Witnessing violence within the community
- Substance abuse in the home
- Experiencing neglect or abuse
- Having a family member attempt or commit suicide
- Growing up in a safe, nurturing environment
- Parental separation or divorce
- Experiencing systemic racism
- Incarcerated family member

7. The child's environment can contribute to ACEs, such as a household with substance use problems, mental health problems, and parental separation. \*

- True
- False

8. Financial hardship is considered an ACE. \*

- True
- False

9. The most recent data on ACEs shows that the following percentage of adults reported having experienced ACEs? \*

- 60%
- 40%
- 20%
- 90%

10. Providers and staff can screen for ACEs in the pediatric primary care setting. \*

- True
- False

11. ACEs are preventable \*

- True
- False

---

This content is neither created nor endorsed by Microsoft. The data you submit will be sent to the form owner.

 Microsoft Forms

# ACEs DNP Project Post Test

Thank you for participating in this anonymous educational intervention and allowing the data to be utilized for the purposes of this DNP project.

\* Required

1. Please re-enter the unique word or number that was used as your participant ID from your pre-test. \*

2. Please answer the following \*

	Novice	Beginner	Competent	Proficient	Expert
Please rate your current knowledge of ACEs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Adverse childhood experiences (ACEs) are defined as: \*

- Negative or potentially traumatic events, occurring at any age which negatively impact health
- Potentially traumatic childhood events occurring between the ages of 0-17 that can negatively impact lifelong health and well-being
- Childhood experiences which lead to mental illness and substance abuse during teenage years
- Experiences of children living in foster care

4. Toxic stress is a result of ACEs exposure and can negatively impact (mark all that apply) \*

- Brain development
- Immune System
- Ability to form stable relationships
- Finances and jobs
- Learning
- Decision making

5. Which conditions in adulthood are associated with an increased risk due to ACEs? \*

- Asthma
- Diabetes
- Stroke
- Risky behaviors (teen pregnancy, STIs, smoking)
- Disabilities

6. ACEs include experiencing \*

- Witnessing violence within the community
- Substance abuse in the home
- Experiencing neglect or abuse
- Having a family member attempt or commit suicide
- Growing up in a safe, nurturing environment
- Parental separation or divorce
- Experiencing systemic racism
- Incarcerated family member

7. The child's environment can contribute to ACEs, such as a household with substance use problems, mental health problems, and parental separation. \*

- True
- False

8. Financial hardship is considered an ACE. \*

- True
- False

9. The most recent data on ACEs shows that the following percentage of adults reported having experienced ACEs? \*

- 60%
- 40%
- 20%
- 90%

10. Providers and staff can screen for ACEs in the pediatric primary care setting. \*

- True
- False

11. ACEs are preventable \*

- True
- False

---

This content is neither created nor endorsed by Microsoft. The data you submit will be sent to the form owner.

 Microsoft Forms

# ACEs DNP Project Follow Up Survey

\* Required

1. Since the completion of the educational intervention, have you begun ACEs screening in your practice? \*

Yes

No

2. Please answer the following \*

Very unlikely      Unlikely      Neither      Likely      Very likely

How likely are you to start screening for ACEs in your practice?

3. Please answer the following \*

Strongly disagree      Disagree      Neither      Agree      Strongly Agree

The educational intervention increased my knowledge regarding ACEs and screening for ACEs.

4. Please answer the following \*

	Strongly Disagree	Disagree	Neither	Agree	Strongly agree
The educational intervention has changed my perception of ACEs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. What are the barriers to screening for ACEs in your practice? \*

6. Do you have any recommendations for further education on ACEs and ACEs screening?  
\*

APPENDIX E:  
PARTICIPANT MATERIAL (EDUCATIONAL MODULE)

# Increasing Provider Knowledge of Adverse Childhood Experiences Screening in Pediatric Primary Care



THE UNIVERSITY OF ARIZONA

College of Nursing

Sonora Robison DNP-PNP Student

[Please click here to begin the required Pretest](#)

Please proceed with the module **after** completing the pre-test  
Learning Objectives

- 
- *Identify ACEs*
  - *Identify ACEs Screening Tools*
  - *Describe the long-term impact of ACEs on the health of individuals*
- 

## Adverse Childhood Experiences

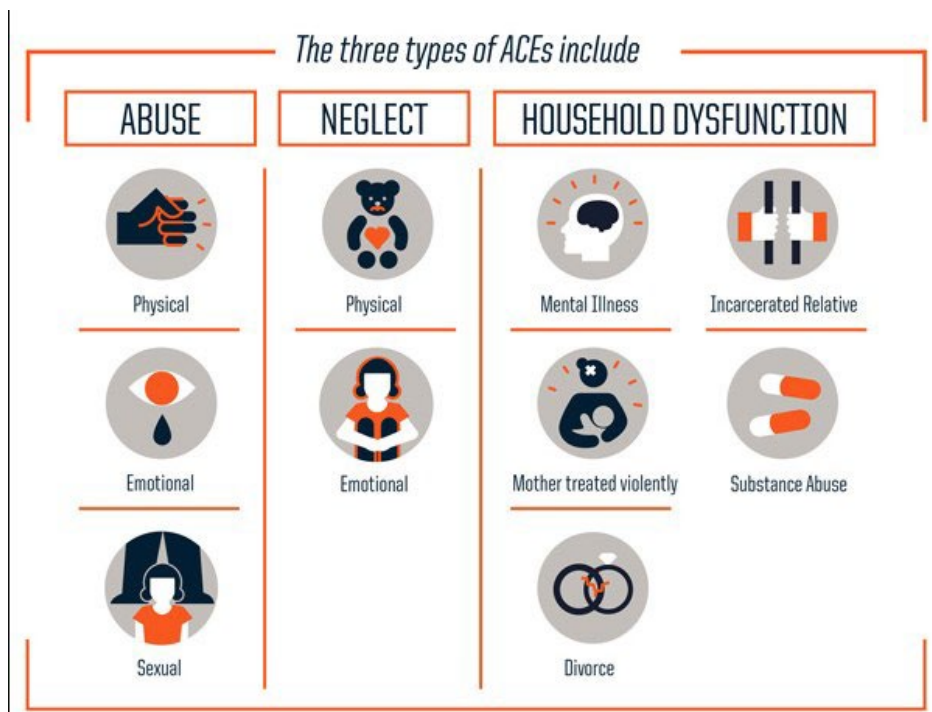
"ACEs are the greatest unaddressed public health threat facing our nation today." --Dr. Robert Block, former AAP president (2012-2013)

---

*ACEs are stressful or traumatic events that children experience growing up. 61% of adults have reported experiencing at least one ACE and of children 0-17 years of age, 43% experienced 1 or more ACEs and 10% experienced 3 or more (DiGangi & Negriff, 2020).*

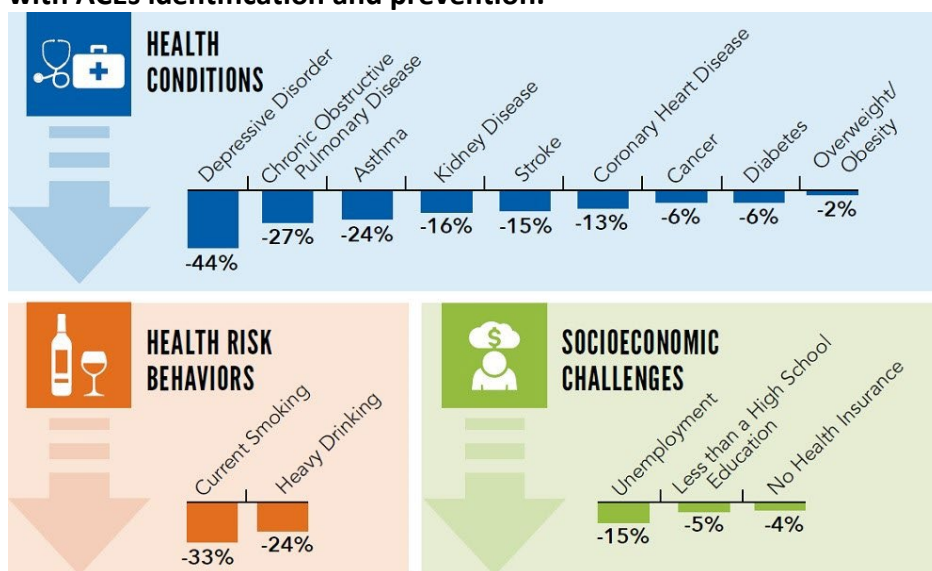
*ACEs are classified into these defined categories:*

- *Abuse (physical, sexual, mental)*
- *Neglect (emotional, physical)*
- *Household dysfunction*
- *Financial hardship*
- *Parental separation (separation, divorce, incarceration)*
- *Parental substance abuse*
- *Parental mental health issues*



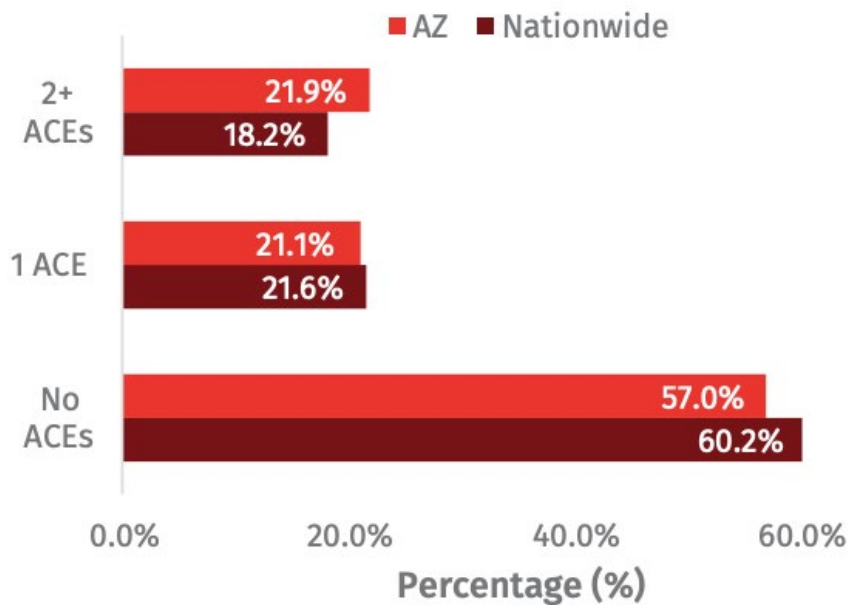
The CDC and Kaiser Permanente conducted the first study on ACEs in 1995. Since then, several studies have been conducted and evidence shows that ACEs are common, even among middle-class populations. There is a powerful correlation between the number of ACEs experienced and the greater risk of poor outcomes later in life. Specifically, heart disease, diabetes, obesity, depression, substance abuse, smoking, poor academic achievement, and early death. Exposure to ACEs is linked to onset of chronic disease, mental illness, violence, and being a victim of violence.

According to the Centers for Disease Control and Prevention (CDC) this diagram is representative of how health conditions, risky behavior, and socioeconomic challenges could be reduced with ACEs identification and prevention.

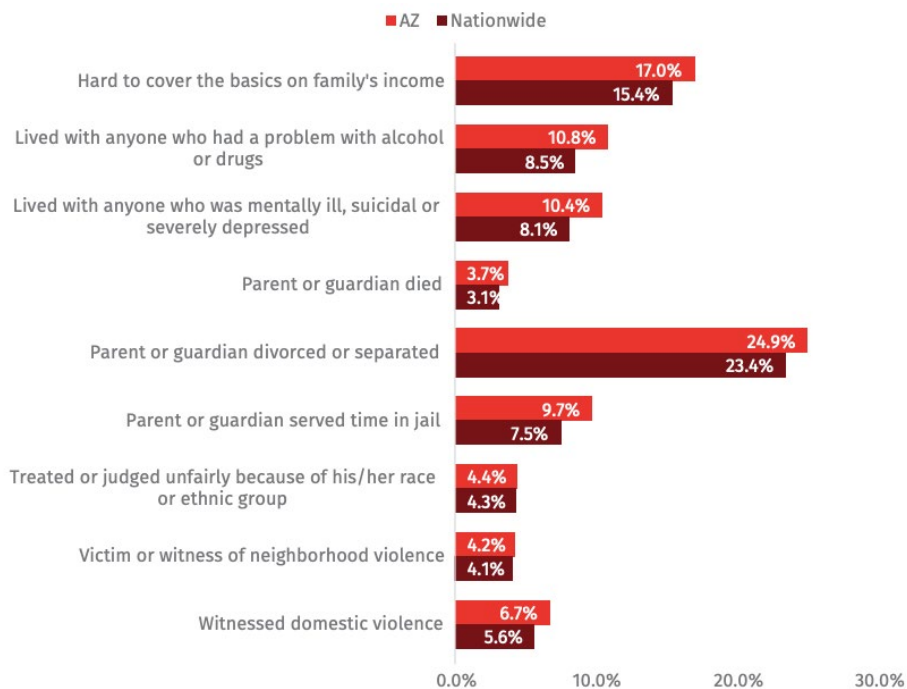


## The Prevalence of ACEs in Arizona

These graphs display data from the National Survey of Children's Health data 2018-2019 and demonstrate how Arizona children compare to the rest of the nation in reported ACEs. In several categories, Arizona children have increased ACEs exposure.

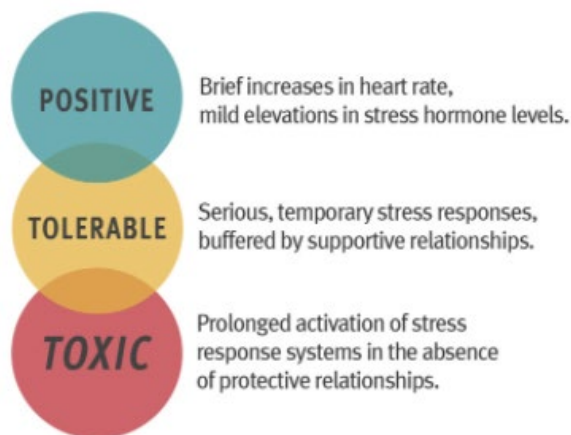


1 - From the National Survey of Children's Health data 2018-2019



2 - From the National Survey of Children's Health data 2018-2019

## Toxic Stress



Toxic Stress can occur when a child experiences strong, frequent, prolonged stress such as physical or emotional abuse, chronic neglect, caregiver substance abuse, violence, family financial hardship. This chronic toxic stress can take a cumulative toll on an individual for a lifetime.

(Center on the Developing Child at Harvard University, 2021)

## Preventing ACEs

- Early identification and intervention can decrease the frequency of ACEs
- Connecting families with community resources can relieve some ACEs
- Open discussions with families during well-visits create an opportunity for anticipatory guidance
- Strengthening family support
- Teach skills to cope with ACEs
- Connect children to mentor programs or community programs

## Screening for ACEs

You can't help what you don't know...

---

*The American Academy of Pediatrics (AAP) recommends screening for toxic stress and ACEs. Evidence supports screening for ACEs in primary care as other routine screens are conducted such as developmental surveillance, anemia, and lead.*

*Children exposed or currently experiencing ACEs often present with psychiatric, behavioral, and somatic symptoms. As with other conditions, early intervention can lead to improved outcomes. An ACE score helps providers identify who may be at risk.*

*(Bachini & Shoptaugh, 2019)*

### Validated screening tools available for pediatric primary care settings

- Safe Environments for Every Kid Parent Questionnaire-Revised (SEEK PQ-R)
- Adverse Childhood Experiences (ACEs) screening tool
- Pediatric ACEs and Related Life-events Screener (PEARLS)

### The Pediatric ACEs and Related Life-events Screener (PEARLS)

This validated screening tool is available to screen children and adolescents ages 0-19 for ACEs. It is available as identified or de-identified in English and Spanish. There are 3 versions of the tool available:

- PEARLS child tool, ages 0-11 to be completed by caregiver
- PEARLS adolescent tool, ages 12-19 to be completed by a caregiver
- PEARLS for adolescent self-report, ages 12-19 to be completed by the adolescent

**Evidence supports screening for ACEs annually with well child visits.**

**Pediatric ACEs and Related Life Events Screener (PEARLS)**  
CHILD - To be completed by: **Caregiver**

At any point in time since your child was born, has your child seen or been present when the following experiences happened? Please include past and present experiences.  
*Please note, some questions have more than one part separated by "OR." If any part of the question is answered "Yes," then the answer to the entire question is "Yes."*

**PART 1:**

- Has your child ever lived with a parent/caregiver who went to jail/prison?
- Do you think your child ever felt unsupported, unloved and/or unprotected?
- Has your child ever lived with a parent/caregiver who had mental health issues?  
*(for example, depression, schizophrenia, bipolar disorder, PTSD, or an anxiety disorder)*
- Has a parent/caregiver ever insulted, humiliated, or put down your child?
- 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?
- Has your child ever lacked appropriate care by any caregiver?  
*(for example, not being protected from unsafe situations, or not cared for when sick or injured even when the resources were available)*
- 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?
- 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?
- Has your child ever experienced sexual abuse?  
*(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)*
- Have there ever been significant changes in the relationship status of the child's caregiver(s)?  
*(for example, a parent/caregiver got a divorce or separated, or a romantic partner moved in or out)*

Add up the "yes" answers for this first section:

Please continue to the other side for the rest of questionnaire

Child (Parent/Caregiver Report) – Deidentified

This tool was created in partnership with UCSF School of Medicine.

**PART 2:**

1. Has your child ever seen, heard, or been a victim of violence in your neighborhood, community or school?  
*(for example, targeted bullying, assault or other violent actions, war or terrorism)*

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2. Has your child experienced discrimination?  
*(for example, being hassled or made to feel inferior or excluded because of their race, ethnicity, gender identity, sexual orientation, religion, learning differences, or disabilities)*

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3. Has your child ever had problems with housing?  
*(for example, being homeless, not having a stable place to live, moved more than two times in a six-month period, faced eviction or foreclosure, or had to live with multiple families or family members)*

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4. Have you ever worried that your child did not have enough food to eat or that the food for your child would run out before you could buy more?

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5. Has your child ever been separated from their parent or caregiver due to foster care, or immigration?

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6. Has your child ever lived with a parent/caregiver who had a serious physical illness or disability?

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7. Has your child ever lived with a parent or caregiver who died?

Add up the "yes" answers for the second section:

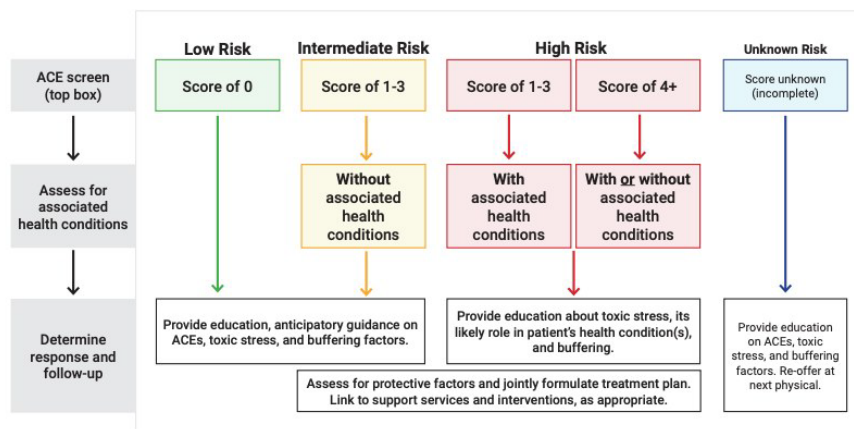
  
 This tool was created in partnership with UCSF School of Medicine.

Child (Parent/Caregiver Report) – Deidentified



**Adverse Childhood Experiences (ACEs) and Toxic Stress Risk Assessment Algorithm**

Pediatrics



This algorithm pertains to the ACE score (top box of PEARLS), whose associations with health conditions are most precisely known. Social determinants of health (bottom box) may also increase risk for a toxic stress response and should be addressed with appropriate services, but should NOT be added to the ACE score for this algorithm. Partial completion may indicate discomfort or lack of understanding. If partial response indicates patient is at intermediate or high risk, follow the guidelines for that category.

If the ACE score is 0, the patient is at "low risk" for toxic stress. The provider should offer education on the impact of ACEs and other adversities on health and development as well as on buffering factors and interventions. If the ACE score is 1-3 without ACE-associated health conditions, the patient is at "intermediate risk" for toxic stress. If the ACE score is 1-3 and the patient has at least one ACE-associated condition, or if the ACE score is 4 or higher, the patient is at "high risk" for toxic stress. In both cases, the provider should offer education on how ACEs may lead to toxic stress and associated health conditions, as well as practices and interventions demonstrated to buffer the toxic stress response, such as sleep, exercise, nutrition, mindfulness, mental health, and healthy relationships. The provider should also assess for protective factors, jointly formulate a treatment plan, and link to supportive services and interventions, as appropriate.

## Is screening in primary care feasible?

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- *Several studies found less than two minutes were added per patient when implementing an ACEs screen*
  - *Caregivers were grateful to providers for having open discussions regarding ACEs*
    - *Screening can lead to early identification and intervention*
  - *ACEs are preventable with appropriate intervention and resources*
- 

*ACEs are as prevalent as other conditions for which standardized screening is already recommended. Screening for ACEs helps identify issues for which resources and interventions are available. ACEs and toxic stress education should be included in anticipatory guidance as it relates to sleep, relationships, exercise, nutrition, and more. ACEs can impact many aspects of development. **In one study, only 1 of 5 children exposed to 3 or more ACEs were developmentally on track** (Jackson, 2021).*

*A local study regarding the implementation of ACEs screening into pediatric primary care found that parents and patients had a positive perception of screening. Evidence shows that screening for ACEs did not negatively impact provider-patient relationships.*

*(Simmons et al., 2021)*

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***How can you help? Pediatric primary care providers are uniquely positioned to implement universal ACEs screening during well visits to identify children at risk and provide early intervention as appropriate to prevent further toxic stress and improve long-term health outcomes.***

**[Please click here to complete the required Post Test](#)**

**[Click this link for a list of references used in the creation of this educational content.](#)**

APPENDIX F:  
LITERATURE REVIEW GRID

Project Question: Does an evidence-based ACEs education for pediatric primary care providers increase provider knowledge of ACEs and intent to screen for ACEs in primary care?

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
2022; ACEs Aware	Screening Tools	CA Campaign		Current campaign to improve screening practices
2020; Barnes	Identifying adverse childhood experiences in pediatrics to prevent chronic health conditions	Review Article	<ul style="list-style-type: none"> <li>• ACEs have cumulative, pernicious effects on lifelong health</li> <li>• trauma-informed care, “surveillance” for ACEs could be a natural part of pediatric health care</li> </ul> <p>ACEs are at least as prevalent as other conditions for which standardized screening is already recommended</p>	<p>Support screening for ACEs in pediatric primary care</p> <p>Efficacy and accuracy of screening tools</p> <p>why, for whom, when, and how to identify ACEs in pediatric clinical care</p>
2021; Barnett	Implications of adverse childhood experiences screening on behavioral health services: A systematic review and systems modeling analysis	Systematic review	<ul style="list-style-type: none"> <li>• 12 articles meeting criteria</li> <li>• demonstrated how ACEs screening may differentially impact behavioral health care systems</li> </ul>	Support screening for ACEs in pediatric primary care
2018; Boullier	Adverse childhood experiences	Review article	<ul style="list-style-type: none"> <li>• Define ACEs</li> </ul> <p>Detail chronic health issues associated with ACEs</p>	Discusses prevention of ACEs and promotion of resilience
2017; Braveman	Economic Hardship in Childhood: A Neglected Issue in ACE Studies?	Journal Article	<ul style="list-style-type: none"> <li>• Define economic hardship as it relates to ACEs</li> </ul> <p>Supports economic hardship as an ACE</p>	Background information for ACEs and economic hardship
2020; Bryant	Screening for Adverse Childhood Experiences in Primary Care: A Quality Improvement Project	Journal Article	<ul style="list-style-type: none"> <li>• QI project to increase provider knowledge related to ACEs</li> <li>• Utilized a screening tool</li> <li>• Created a new standard of care in pediatric primary care</li> </ul>	<p>Utilized educational intervention for providers to increase screening for ACEs</p> <p>Utilized a pre/posttest and had a statistical significance</p>
2020; Campbell	Screening for Adverse Childhood Experiences	Journal article/Opinion	<ul style="list-style-type: none"> <li>• Proposes potential harms of ACEs screening</li> </ul>	Contradicting statements

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
	ACEs in Primary Care: A Cautionary Note		<ul style="list-style-type: none"> <li>• People may be offended by questions</li> <li>• Fear of CPS reporting based on responses</li> </ul> Negative psychological effects of being labeled high risk	Provides alternate theory toward ACEs screening
2021; Cooke	A systematic review of the biological correlates and consequences of childhood maltreatment and adverse childhood experiences	Systematic Review	<ul style="list-style-type: none"> <li>• 199 studies included</li> <li>• Show that ACEs at sensitive periods of development influence health and behavior across the lifespan</li> </ul>	Defines ACEs and links them to poor outcomes in adulthood.  Discusses implications of findings
2021; Crenshaw	Lessons Learned from a Quality Improvement Initiative: Adverse Childhood Experiences Screening in a Pediatric Clinic	Journal Article	<ul style="list-style-type: none"> <li>• QI project to implement screening for ACEs in peds clinic</li> <li>• Used PDSA cycles</li> <li>• Screened 232 families</li> </ul> Found the time to discuss the screen was averaged at 86 seconds	Demonstrated that implementing screening in clinic is feasible for well visits  Demonstrated that time did not have to be a barrier for implementation
2020; DiGangi	The Implementation of Screening for Adverse Childhood Experiences in Pediatric Primary Care	Journal Article	<ul style="list-style-type: none"> <li>• Implemented screening for ACEs in many facilities</li> <li>• Screened at 3 and 5 year WCC</li> <li>• Identified issues with follow up for positive screens</li> </ul> Found that screening was feasible	Demonstrated that implementing screening was feasible and needed  Highlights need for education about ACEs to prevent toxic stress
1998; Felitti	Adverse childhood experiences and health outcomes in adults: the Ace Study	Journal article	<ul style="list-style-type: none"> <li>• Original work</li> </ul> The first ACEs study	Original work about first ACEs study, outlines significance of ACEs and identification
2020; Gilgoff	Adverse Childhood Experiences, Outcomes, and Interventions	Journal Article	<ul style="list-style-type: none"> <li>• Defines ACEs</li> <li>• Associates ACEs and. Negative health outcomes</li> </ul> Promotes screening in primary care due to regular intervals of visits	Supports screening in the primary care setting  Promotes including ACEs as anticipatory guidance as it

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
				relates to sleep, healthy relationships, exercise, nutrition, etc.
2019; Gillespie	Screening for Adverse Childhood Experiences in Pediatric Primary Care: Pitfalls and Possibilities	Journal Article	<ul style="list-style-type: none"> <li>Identifies barriers to screening for ACEs in primary care</li> <li>Discusses implications of toxic stress</li> </ul> Discusses how some clinics have overcome screening barriers	Supports screening in primary care  Demonstrates overcoming barriers to screening
2021; Goddard	Adverse Childhood Experiences and Trauma-Informed Care	Journal Article	<ul style="list-style-type: none"> <li>Defines ACEs and connects to chronic adult health issues</li> <li>Connects trauma informed care to ACEs</li> </ul> Provides guidance on how to appropriately discuss ACEs in practice	Supports screening for ACEs and discussing findings through a therapeutic approach to promote healing and not re-traumatize
2021; Jackson	Adverse Childhood Experiences and School Readiness Among Preschool-Aged Children	Journal article	<ul style="list-style-type: none"> <li>Data from 15402 preschool age children in 2016-18</li> <li>Assessed learning skills, self-regulation, social emotional development and physical health and motor development</li> <li>Half of children with no ACEs were on track</li> </ul> Only 1 in 5 children exposed to 3 or more ACEs were on track	Accumulation of ACEs increased areas that children need support or are at risk  Support identifying best practices to reduce ACEs early  Supports developmental impact
2022; Jee	Maximizing the benefit of screening for adverse childhood experiences	Journal Article	<ul style="list-style-type: none"> <li>ACEs affect two thirds of US adults</li> <li>Linked to mental health, social outcomes, cancer, pulmonary disease, liver disease, autoimmune dysfunction, depression, anxiety, and suicidality</li> </ul> Discusses rationale for screening in primary care	States that screening can ameliorate health outcomes  Raises questions that identified problems may lead to unnecessary proactive identification of future toxic stress
2021; Jones	Factors Related to Providers Screening Children for Behavioral Health	Journal Article	<ul style="list-style-type: none"> <li>Same of 319 physicians and 292 NPs</li> <li>Percentages of providers screening for different adversities listed</li> </ul>	There is still a reluctance to screen  Supports screening

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
	Risks in Primary Care Settings		<ul style="list-style-type: none"> <li>Screening was associated with higher referral rates</li> </ul> Providers felt more confident in providing support	Recommends screening for ACEs but states training must come first
2020; Keeshin	Screening for Trauma in Pediatric Primary Care	Journal Article	<ul style="list-style-type: none"> <li>Discusses the importance of screening for trauma in peds primary care</li> </ul> Doesn't discuss ACEs specifically	Recommends screening in peds primary care  Supports trauma screening but not ACEs specifically
2021; Kong	Adverse childhood experiences amplify the longitudinal associations of adult daily stress and health	Journal Article	<ul style="list-style-type: none"> <li>Links ACEs and daily stress processes in adulthood</li> <li>Data from the national study of daily experiences 2</li> <li>Significant positive associations between daily stressor exposure and daily negative affect</li> </ul> Indirect effect stronger for adults with high ACEs	Support the claim that ACEs in childhood directly impact adult health  Supports that early identification could impact chronic health in adulthood
2021; Liu	Pediatric ACES assessment within a collaborative practice model: Implications for health equity	Journal Article	<ul style="list-style-type: none"> <li>Mixed methods</li> <li>Looked at feasibility, acceptability, and utility of ACEs screening in primary care</li> <li>Screened 158 participants</li> <li>Significant associations between level of ACEs exposure and degree of mental health impairment</li> </ul> Providers felt the screening was feasible	Implemented ACEs screening into peds primary care  Providers felt the process was feasible and acceptable  Used a collaborative practice model
* 2022; Loveday	Screening for Adverse Childhood Experiences in Children: A Systematic Review	Systematic Review	<ul style="list-style-type: none"> <li>Systematically reviewed whether screening for ACEs in children leads to an increase in identification of aces, referrals, increased uptake of services, and improved mental health outcomes</li> <li>Only 4 articles met inclusion criteria</li> <li>Limited data</li> </ul>	Claims that evidence may not support screening for ACEs  Only 4 articles were included

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
			Makes claim that evidence may not support screening	
2021; Marcoux	Adverse childhood experiences and trauma informed care: treating the whole patient with a more complete osteopathic approach	Journal Article	<ul style="list-style-type: none"> <li>• Discusses using the trauma informed care TIC model as a treatment approach</li> <li>• Links TIC and ACEs</li> <li>• TIC encourages trauma identification, early intervention, and policy change</li> </ul> Stresses importance of avoiding re-traumatization	Supports the connection between TIC and ACEs support  Supports early identification and intervention
2022; Naicker	The Long-Term Health and Human Capital Consequences of Adverse Childhood Experiences in the Birth to Thirty Cohort: Single, Cumulative, and Clustered Adversity	Retrospective Longitudinal Study	<ul style="list-style-type: none"> <li>• Birth to Thirty in South African birth cohort</li> <li>• Human capital outcomes were measured</li> </ul> Adversity in childhood linked to broad range of negative outcomes in young adulthood	Only longitudinal study found  Supports that ACEs can negatively impact people into adulthood  Used different measures and outcomes
2020; Popp	Pediatric Practitioners' Screening for Adverse Childhood Experiences: Current Practices and Future Directions	Journal Article	<ul style="list-style-type: none"> <li>• Pilot study</li> <li>• Surveyed pediatric practitioners on screening practices of ACEs</li> <li>• Gathered perspectives to screening and barriers to screening</li> </ul>	Surveyed provider attitude and opinion towards ACEs screening  Barriers defined
2020; Reed-Ashcraft	Addressing adverse childhood experiences, trauma and resilience through interprofessional course development	Journal Article	<ul style="list-style-type: none"> <li>• Creation of interprofessional course at undergraduate and graduate levels focusing on ACEs</li> </ul> Looks at interprofessional collaboration for evidence-based prevention and treatment	Ties in the significance of interprofessional collaboration  Supports need for provider education  Suggests education become part of training
2019; Schmitz	Adverse Childhood Experiences and Trauma-Informed Care: An Online	Journal Article	<ul style="list-style-type: none"> <li>• Recommends pediatricians be educated to recognize ACEs</li> <li>• Discusses use of TIC to approach ACEs</li> <li>• Identifies lack of provider education</li> </ul>	Identifies need for peds primary care providers to be educated about ACEs

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
	Module for Pediatricians		Created an online module	Creation of online module with pre/post test  Module showed success and states it can be adapted
2019; Selvaraj	Screening for Toxic Stress Risk Factors at Well-Child Visits: The Addressing Social Key Questions for Health Study	Journal Article	<ul style="list-style-type: none"> <li>• Created <i>Addressing Social Key Questions for Health Questionnaire</i> to screen for ACEs and unmet social needs</li> <li>• Used on children 0-17 years old at well visits</li> <li>• 2569 screenings completed</li> <li>• Found that screening was feasible and acceptable for providers and families</li> </ul> Improved identification and management of family needs	Supports use of a screening tool  Created a screening tool  Tool not validated  Screening was feasible and acceptable
2021; SmithBattle	Evidence for Revising the Adverse Childhood Experiences Screening Tool: a Scoping Review	Scoping Review	<ul style="list-style-type: none"> <li>• Links ACEs to chronic illness and premature mortality</li> <li>• Looking to expand ACEs categories and revise the formatting and scoring of the screening tool</li> <li>• Uses the ACE tool</li> </ul> 18 articles met criteria	Evidence supports expansion of ACE screening tools  Supports assessment and timely treatment for childhood trauma
2022; Strauch	The current state of patient-to-provider communication of childhood adversity in primary care	Systematic Review	<ul style="list-style-type: none"> <li>• Focused on ACEs related communication between providers and patients</li> </ul> No standardized process for communication	Focused on adult communication Looked at adult reported ACEs (retrospective)  Not entirely relevant for this project
2016; Szilagyi	Factors Associated With Whether Pediatricians Inquire About Parents' Adverse Childhood Experiences	Journal Article	<ul style="list-style-type: none"> <li>• Used data from 85<sup>th</sup> periodic survey of the AAP</li> <li>• 302 pediatricians answered questions about their beliefs about childhood stressors, their role in advising parents, and if they asked about ACEs</li> </ul>	Demonstrates that pediatricians aren't addressing ACEs as much as they should  Identifies need for resources and education about ACEs for providers

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
			Few inquire about ACEs	*Older reference
2020; Thakur	Pediatrics adverse childhood experiences and related life events screener (PEARLS) and health in a safety-net practice	RCT	<ul style="list-style-type: none"> <li>Utilized PEARLS screening tool</li> <li>Randomized 367 participants to item response, total number of exposures, or no screening (control)</li> </ul> Identifies need to screen and intervene early	Only study that used PEARLS tool  Supports the need to screen and react with early intervention  Demonstrates validity/reliability of PEARLS
2020; Turner	Strengthening the predictive power of screening for adverse childhood experiences (ACEs) in younger and older children	Journal Article	<ul style="list-style-type: none"> <li>Study compared 40 ACEs covering 11 domains and their ability to predict trauma symptoms in childhood</li> <li>Used National Surveys of Children's Exposure to Violence in 2008, 2011, and 2014</li> </ul> Demonstrated more variance in subsequent trauma	Demonstrates the importance of screening for ACEs  Loosely identifies how screening leads to early intervention
2019; Watson	How to screen for ACEs in an efficient, sensitive, and effective manner	DNP Project	<ul style="list-style-type: none"> <li>DNP project that asks why don't pediatricians screen for ACEs</li> <li>Discusses that ACEs screening instrument is validated and accessible</li> <li>States that ACEs meet evidence-based criteria for screening: prevalent, detectable, and associated conditions have early interventions available</li> </ul> <i>#1 reason they don't is d/t knowledge to action gap</i>	DNP project that identifies ACEs screening barrier is lack of education  Gives a step-by-step on how to implement screening in peds primary care
2021; Zhan	Adverse Childhood Experiences (ACEs): Development of an ACEs Knowledge Scale	Journal Article/Study	<ul style="list-style-type: none"> <li>Evaluated nursing students' understanding of ACEs</li> <li>Used <i>ACEs Knowledge Scale</i></li> </ul> Tool was found to have good validity in measuring ACEs knowledge	*Offer an ACEs Knowledge Tool that can be used to determine provider base knowledge  Valid and reliable tool

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