

Incorporating Adverse Childhood Experiences Screening into Pediatric Primary Care

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She has no known conflict of interest to disclose.

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Abstract

Purpose/Background: Children exposed to adverse childhood experiences (ACEs) and toxic stress have an increased risk of developing chronic illness and early death in the absence of protective factors. Many providers feel inadequately prepared to screen for and treat ACEs. This quality improvement project, based on the Health Belief Model, investigated if providing ACEs education before a screening program is effective in improving attitudes, knowledge, and the number of completed screenings. **Method:** The project was conducted at a pediatric primary care practice in the southwestern United States. All providers voluntarily consented to attend four education sessions: 1) Trauma overview, 2) Trauma physiology, 3) Trauma-informed care, 4) Screening tool/referral process. An anonymous pre/post-education Likert-Scale survey was completed to assess knowledge and attitudes about ACEs and screening. The number of completed ACEs screening tools and referrals made were collected four- and eight-weeks post-implementation. **Results:** Data were analyzed using Intellectus Statistics SoftwareTM. There was a significant increase in ACEs knowledge from the pre-test ($p = .011$, $\alpha = .05$). There was not a significant change in attitudes from the pre-test ($p = .066$, $\alpha = .05$). However, the mean pre- to post-survey scores increased for both categories, indicating improved attitudes. Over the first four weeks, 75% of eligible children were screened and 6% were referred to an ACEs resource program. In the second four weeks, 56% of children were screened and 8.6% were referred. **Discussion:** A comprehensive education program for providers can improve knowledge about ACEs screening, leading to improved screening practices, early identification, and the introduction of protective resources.

Keywords: adverse childhood experiences, ACEs, trauma-informed care, toxic stress, screening, chronic illness

Incorporating Adverse Childhood Experiences Screening into Pediatric Primary Care

Chronic exposure to adverse childhood experiences (ACEs) has been linked to lifelong mental and physical complications. The Centers for Disease Control and Prevention (CDC)-Kaiser Permanente sentinel ACEs study characterized ACEs into the following categories: a) abuse including psychological, physical, and sexual; b) measures of household dysfunction including substance abuse, mental illness, domestic abuse of parents; and c) criminal behavior and incarceration of family members (Felitti et al., 1998). The cumulative and chronic effects of these exposures can lead to varying degrees of illness in the absence of protective factors in a child and adult's life. While ACEs cannot always be prevented, early identification and intervention can improve a child's quality of life and wellbeing.

Problem Statement

Adverse childhood experiences can have a deleterious impact on the lives of children and adults. Exposure to four or more ACEs has been associated with several leading causes of death in the United States (U.S.) including heart disease, stroke, diabetes, respiratory illness, accidental injury, and intentional injury (CDC, 2021; Felitti et al., 1998; Marie-Mitchel & Kostolansky, 2019; World Health Organization, 2021). Many of these preventable causes of death share risk factors associated with ACEs, including obesity, substance abuse, mental illness, and risk-taking behaviors (Baldwin et al., 2021; Marie-Mitchell & Kostolansky, 2019). These interrelated risk factors and illnesses account for significant morbidity and mortality throughout the lifespan.

Adverse childhood experiences have been recognized as a growing concern for all ages. In the U.S., 61% of adults reported exposure to at least one ACE, and 16% reported exposure to four or more ACEs (CDC, 2019). Locally, in Arizona, 31.1% of children zero to 17 years of age have experienced two or more ACEs, compared to the national average of 22% (Arizona

Department of Health Services [ADHS], 2019). While the impact of ACEs has been researched for over twenty years, this problem is not addressed in many pediatric primary care practices. In a study performed by Kerker et al. (2016), only 2% of the 302 pediatricians surveyed reported being very familiar with the original ACE study. Only 4% reported asking patients about all categories of ACEs. Despite the growing body of knowledge regarding the adversely associated health impacts, interventions remain largely absent.

Purpose and Rationale

By addressing ACEs in primary care, it may be possible to reduce the risk for chronic illness and premature death through early identification. Pediatric primary care offices provide a setting for early intervention that can provide the child and family with protective resources. This aim aligns with several national initiatives identified in the Healthy People 2030 goals, including: reducing the number of young adults who have three or more ACEs, increasing the proportion of adolescents who have a supportive adult in their lives, and increasing the proportion of children and adolescents who show resilience and positive coping skills (United States Department of Health and Human Services, n.d.). The purpose of this Doctor of Nursing Practice (DNP) project was to explore and evaluate if an education program increases the number of screenings performed and referrals for resources made.

Background and Significance

The original ACE study associated a dose-response relationship between the number of exposures to ACEs and chronic diseases, including ischemic heart disease, chronic bronchitis and emphysema, cancer, hepatitis or jaundice, skeletal fractures, and self-reported poor health (Felitti et al., 1998). This study was the first of its kind to link cumulative exposure to one or more ACEs with an increased risk of developing these health conditions later in life. Chronic

exposure to the physiologic stress response and the impact of trauma on the neural pathways in a child's developing brain can increase the risk for anxiety and depressive disorders, difficulty controlling anger, and sexual promiscuity (Baldwin et al. 2021; Crouch et al., 2019b; Felitti et al., 1998; Marie-Mitchell & Kostolansky, 2019). Epigenetic changes create a cycle of exposure that impacts the individual and future generations through genetics, poor parenting skills, and socioeconomic factors. Authors demonstrate that low-income and ethnic minorities experience a disproportionate amount of exposure to ACEs (Giovanelli et al., 2016; Kia-Keating et al., 2019; Rariden et al., 2019). Risk factors associated with ACEs such as coping dysfunction, behavioral and learning difficulties, substance abuse, and sleep dysfunction can impair an individual's ability to hold a job or provide a nurturing and safe environment for their children (Conn et al., 2018; Crouch et al., 2019b; Giovanelli et al., 2016; Marie-Mitchell & Kostolansky, 2019; Petruccelli et al., 2019; Rariden et al., 2021). Dysfunction and chronic illness can perpetuate the cycle of adversity.

Despite the extensive knowledge of ACEs' impact, there is a lack of intervention on a primary care level. Kerker and colleagues (2016) found that most pediatric providers believe chronic stress exposure can decrease coping abilities and brain development. Yet only 34% of pediatricians agreed that chronic exposure to physiologic stress results in epigenetic changes. Furthermore, only 11%-26% report familiarity with the original ACE study and even fewer pediatricians screen for all categories of ACEs (Kerker et al., 2016; Marsicek et al., 2018). There are many perceived barriers to addressing ACEs in primary care, including time constraints, competing requirements, lack of knowledge and training of childhood adversity, the uncertainty of how to treat a child with exposure to ACEs, and perceived patient acceptability (Kia-Keating

et al., 2019; Marsicek et al., 2018; Rariden et al., 2021). These knowledge gaps and perceived barriers contribute to the lack of interventions practiced.

Population

Interventions targeted to the pediatric population can reduce morbidity and mortality through early identification. Children exposed to ACEs at a younger age have been found to have worse outcomes because of damage to the developing brain and the cumulative effect of ACEs over a lifetime (Felitti et al., 1998; Giovanelli et al., 2016). Pediatric primary care providers are in a position where they have frequent encounters with their patients and families during well-visits. This presents an opportunity for providers to identify patients who have excessive exposure to ACEs, provide education, and make referrals for needed resources (Conn et al., 2018; Kerker et al., 2016; Marie-Mitchell & Kostolansky, 2019; Marsicek et al., 2018). Early intervention at the primary care level can mitigate the effects of ACEs.

Current Interventions

Unfortunately, there is little evidence for interventions and the long-term impact on individuals with exposure to ACEs. Screening for ACEs in primary care offices could help identify patients with high ACE exposure or whose exposure has increased from one visit to the next (Conn et al., 2018; Giovanelli et al., 2016; Kerker et al., 2016; Kia-Keating et al., 2019; Marie-Mitchell & Kostolansky, 2019; Marsicek et al., 2018; Rariden et al., 2021). One of the most notable challenges to implementing primary care screening practices is the lack of ACEs education among providers, uncertainty with the appropriate language to use when having sensitive conversations, and how to treat a positive screen (Felitti et al., 1998; Kerker et al., 2016; Kia-Keating et al., 2019; Marsicek et al., 2018). Providing comprehensive education to

clinicians regarding the background and significance of ACEs, screening tool training, and appropriate referral making could improve competency and acceptance of screening practices.

Current Practice

Currently, there is no established evidence-based intervention for reducing ACEs in children. According to Kerker et al. (2016), only 2% reported using a screening tool to assess for ACE exposure, and 49% of providers reported they had never heard of the ACEs screening tool. Verbal screening that only includes some ACE categories will misrepresent the patient's cumulative ACE score (Kerker et al., 2016; Marsicek et al., 2018). The current healthcare practice increases the risk of missed teaching and referral opportunities.

Outcome

A successful ACEs screening intervention will enable providers to act as change agents in a time-efficient manner. Authors demonstrate that many parents and families feel that these conversations with their providers enrich their relationship and enhance trust (Conn et al., 2018; Kia-Keating et al., 2019; Marie-Mitchell & Kostolansky, 2019; Rariden et al., 2021). Identifying patients with high ACE exposure allows the provider to make appropriate referrals such as early intervention programs, mental health services, community resources, and tailored anticipatory guidance (Conn et al., 2018; Giovanelli, 2016; Marie-Mitchell & Kostolansky, 2019; Rariden et al., 2021). Having a trusted adult present and available serves as a protective factor against the trauma of ACEs. Therefore, providers must engage in parent teaching, emphasizing the parent-child relationship (Conn et al., 2018; Marie-Mitchell & Kostolansky, 2019; Rariden et al., 2021). Early identification with open communication will allow for the acquisition of protective resources.

Since ACEs have a dose-response relationship with morbidity and chronic illness, children are at particularly high risk for changes to their brain structures and developing pathways. This results in epigenetic changes that can be passed down to future generations. Pediatric primary care providers have an opportunity to identify those at risk. A standardized ACE education and screening process will provide clinicians with the necessary tools to offset sequelae from ACE exposure. Early intervention and referrals for needed resources will provide children with the protective factors they need to thrive despite exposure to ACEs. This resiliency has the power to break the cycle of adversity, ultimately improving the health and wellbeing of children and adults in the U.S.

Internal Evidence and PICOT

A pediatric primary care practice, serving three locations in and around the greater Phoenix metropolitan area, was evaluated and it was determined to be lacking a screening practice for ACEs. With Arizona ranking 50/50 of states for the percentage of children exposed to two or more ACEs, this is both a local and national imperative (ADHS, 2019). This primary care pediatric practice strives to become certified as a medical home. Therefore, investing in a screening procedure that improves their population's health aligns with the practice goals.

This inquiry has led to the following PICOT question: Among primary care clinicians, will providing an ACEs education program with the use of a validated tool compared to the current practice impact the number of screenings that are performed and referrals that are made over six months?

Evidence Synthesis

Search Strategy

A comprehensive review of pertinent research was conducted to answer the PICOT question. Four databases were thoroughly searched including PubMed, CINAHL, PsycINFO, and the Cochrane Library. These databases were used due to their extensive collection of rigorous literature.

Keyword Selection

Keywords used in all databases included: *trauma-informed care, ACEs or adverse childhood experiences; primary care providers (or physicians or doctors or clinicians or healthcare provider), education, pediatrics, and intervention*. A search on PubMed using adverse childhood experiences or ACEs, education, and primary care yielded 67 results. A search on CINAHL using adverse childhood experiences or ACEs, physicians or doctors or clinicians or healthcare providers, and education or screening yielded 69 results. A search on PsycINFO using trauma-informed care, pediatrics, and providers yielded seven results. A search on Cochrane Library using adverse childhood experiences, intervention, and pediatrics yielded five results.

Inclusion Criteria, Exclusion Criteria, and Limitations

Exclusion criteria included articles written before 2016 and those that did not include ACEs or trauma-informed care. Some studies included parents of pediatric patients as searches that excluded the adult population severely limited the results. Inclusion criteria were comprised of articles written in English that involved ACE screening or trauma-informed care and were set in the primary care setting.

Results

A rapid critical appraisal of 20 articles was performed. Ten of the highest quality studies were chosen to be included in this literature review. The selected articles examine the

relationship between ACEs education and the use of ACEs screening tools among pediatric clinicians, acceptability of ACEs screening among patients and providers, and best practices for feasible screening implementation.

Critical Appraisal and Synthesis

The selected studies were critically appraised using the Melnyk and Fineout-Overholt (2019) rapid critical appraisal (RCA) process to determine the study strength and quality. Most of the studies are level IV cohort or cross-sectional studies. Two-level I systematic reviews were included, and one level VI qualitative study. While many of the studies are lower-level evidence, these methods allowed for an exploration of the attitudes of both parents and primary care providers. The combination of the quantitative studies (see Appendix A, Table A1), qualitative study (see Appendix A, Table A2), and synthesis table (see Appendix A, Table A3), provide a deeper understanding of the current ACE knowledge, beliefs, and practices.

Five studies were conducted in medical practices, three studies sent surveys to the homes or workplaces of patients, parents, and providers, and two included studies in various settings. The adult populations included were adults who experienced ACEs as children, parents with young children, or pediatric providers. All studies were performed within the U.S. The studies represent the opinions and beliefs of primary care providers and parents to better understand the current attitudes related to ACEs screenings, perceived barriers, and how those impact screening practices.

Discussion

Exposure to ACEs has been demonstrated to increase the risk of poor health outcomes in children without protective factors. With screening, the primary care provider (PCP) can effectively intervene to improve the lives of children exposed to ACEs. Perceived barriers to

implementation include parental willingness to participate, parent and provider insecurity with having sensitive conversations, lack of knowledge of community resources and interventions, and the provider's lack of time. However, most parents supported screening for ACES, view their PCP as an influential partner in their child's care, and are receptive to resource referrals. By strengthening the parent-child relationship, protective relationships are established. Therefore, PCPs should be offering an education program to strengthen interpersonal skills, improve knowledge of ACEs and interventions, and break down perceived barriers. This knowledge will enable the PCP to efficiently screen for ACEs, educate patients, provide meaningful resources, and enrich the relationship between patient and provider.

Theoretical Framework and Implementation Framework

Theory Application

The Health Belief Model (HBM) developed by Godfrey Hochbaum, Stephen Kegels, and Irwin Rosenstock was chosen to guide this quality improvement project due to its applicability to changing preventative health behaviors. The HBM has six constructs including perceived susceptibility, severity, benefit, barriers, cue to action, and self-efficacy (see Appendix B, Figure B1) (Rosenstock, 1974). While this theory was originally developed from the perspective of a patient engaging in preventative health behaviors, it can also be applied to a PCP engaging in preventative health interventions. A lack of education or understanding of patient susceptibility and the severity of consequences may discourage PCPs from changing their practice behaviors to include ACE screening. There are many perceived barriers and without knowledge of local resources and intervention protocols, the perceived benefit of this screening to their patients will be low. An education program will provide knowledge regarding susceptibility, threat, and consequences. Additionally, education may improve their perception of self-efficacy by

supplying providers with tools to handle sensitive conversations. Together these factors create a cue to action and a reason to engage in health-promoting behavior. The lack of screening has a multi-factorial origin; therefore, the education program must be comprehensive to be successful. Primary care providers must understand the core issue, know how to improve the situation, and feel confident in their ability to do so.

Implementation Model

The Quality Improvement Model offers a continuous improvement process with the following phases: plan, do, study, and act (see Appendix B, Figure B2) (Institute for Healthcare Improvement [IHI], 2021). The first phase determines the objectives of the intervention, predicts what will occur, and develops a plan to test the change. The next stage trials the intervention on a smaller scale, noting any problems encountered or unexpected occurrences. In the study phase, data analysis results are compared to the baseline predictions and used to reflect on what has been learned. The final stage refines the change based on the data analysis and prepares for the next implementation (IHI, 2021). This model aligns with the doctoral quality improvement project regarding the timeline and quality of its proposed intervention. By assessing, refining, and improving the intervention the partner site will see a productive change that is congruent with their workflow. This model acknowledges that there will be unexpected issues and room for improvement. By assessing the individual data, tailored modifications that best meet the needs of the site can be made.

Additionally, this model focuses on accomplishing a practice change that leads to improvement. The goal of the partner site is to improve the wellbeing of the children that they provide care for. This model emphasizes that change with no result requires reassessment and

modification or refinement to reach the goal of improvement (IHI, 2021). Through this process, the change itself becomes more efficient and minimizes resistance.

Methods

Setting

The ACEs education and screening intervention took place at a pediatric primary care practice near the greater Phoenix metropolitan area. They serve approximately 20,000 children annually and specialize in the care of infants, children, and adolescents. The practice's three locations primarily serve communities of color (68.5-87.3%), have a higher rate of single-parent households (33.6-42.6%) compared to the state average (26.9%), and have a varying range of children under the age of twelve living in poverty (21-39.7%) compared to the state average (24.2%) (ADHS, 2021a; ADHS, 2021b; ADHS, 2021c). The intervention took place at one of the three practice locations. It was identified that ACEs were not previously evaluated at this site. This practice aspires to become a medical home to its patient population and offer comprehensive in-house care or referrals to a variety of specialties. Assessing ACEs and preventing long-term health consequences aligns with their practice mission.

Additional stakeholders strengthen the support for ACEs screening. Phoenix Children's Hospital (PCH) is an advocate for ACEs screening, which led to the development of PCH's Center for Resiliency and Wellbeing (CRW) (ADHS, 2019). The goal of the CRW is to provide a comprehensive team that can help manage referrals and build strengths and protective factors in the lives of children who have experienced ACEs or childhood trauma (PCH, 2021). Through partnerships with local pediatric practices, the CRW can expand its referral base, reducing the burden of ACEs on Arizona children. The CRW provides strength building, referrals to community resources, as well as emotional and behavioral healthcare for both the child and family. The

Arizona Department of Health Services (ADHS) also recognizes the impact of ACEs on Arizona children. They have identified an ACEs action plan to help decrease the burden of ACEs on children (ADHS, 2019). Healthier and more resilient children will create a stronger Arizona. These local to statewide organizations have identified shared goals and values that will help support ACEs screening in the project setting.

Ethical Considerations

To ensure participant privacy, no personal identifying information was collected. All surveys used during the intervention were anonymous and the internet protocol (IP) address tracking was disabled through the survey provider website. Data reports generated by the practice did not include any identifying patient information. Before the intervention implementation, approval was obtained by the Arizona State University (ASU) Institutional Review Board (IRB) on August 3rd, 2021. A modification approval for the method design was approved on November 13th, 2021. (See Appendix C for the IRB approval letters).

Intervention

The needs and goals of the practice were evaluated with the chief executive officer of the practice to determine the aim of the intervention. While the practice already uses many screening tools for development, autism, and depression, they did not screen for ACEs. This DNP project implemented an ACEs education program for providers and an ACEs screening program for the pediatric patients seen at the practice.

Education Program and Surveys

The DNP project intervention assessment began with a pre-education survey that was emailed to the participating providers to evaluate their knowledge and attitudes about ACEs

screening (see Appendix D and E for project intervention timeline and survey tools). The practice's operations manager provided all email addresses to the project facilitator.

The education program featured four 50-minute sessions for providers at the private practice. The education sessions, designed and delivered by the CRW via Zoom, included: Session One: Overview of Trauma, Session Two: Physiology of Trauma, Session Three: Trauma-Informed Care, and Session 4: Referral Process.

After the education was complete, a post-education survey was emailed to the participating providers to assess for a change in knowledge and attitude regarding ACEs screenings. The immediate goal of the provider education intervention was to empower providers to confidently and productively use the screening tool to make positive changes in the child's life. The long-term goal of the screening intervention was to decrease the health impact of ACEs by improving positive relationships and increasing access to protective resources.

Screening and Referral Process

Before the intervention, the practice's educational handouts were supplemented to ensure the availability of all ACEs related topics. These educational parent handouts were supplied by the CRW. Billing codes, to reflect the administration of the screenings, were determined and provider education concerning the billing coding was included in the education sessions.

The screening tool was provided by the CRW and includes ten questions regarding exposure to all ACE topics. The plan included beginning annual ACE screening for children between the ages of 1-to 17 years. This screening form instructs the parent or patient to write only the total summed score at the top of the form, without identifying individual question answers. The ACE screening tool features an additional box where parents can request educational materials on various topics. The parent or child checks the box of any materials they

are interested in receiving. These materials are gathered and provided to the family by the medical assistant (MA).

The provider evaluated the summed ACE score before entering the patient's room and used the score as a tool to guide their assessment of the child and family. Based on the protocol provided by the CRW and approved by ASU IRB, if the patient scores a zero, they received education on family strengths and were offered handouts on ACEs, resiliency, positive parenting, and foundations to health (Center for Resiliency and Wellbeing [CRW], personal communication, September 21, 2021). If a patient scored 1-3 with no concerning signs or symptoms (e.g., poor grades, signs of poor coping, drug use, among other assessment red flags), they received the same education with the addition of the signs and symptoms of toxic stress. These patients and families also received referrals to community resources if desired. If a patient scored 1-3 with concerning symptoms or a 4 or above, they received the same education and handout options with the addition of a toxic stress handout and were referred to the CRW program, counselling, and community resources (CRW, personal communication, September 21, 2021). The providers used their assessment of the child and the CRW screening protocol to determine if referrals and resources were needed.

Due to a delay in the capability of the CRW to accept referrals in the early months after initiation of the DNP project, there was a lapse in time between the end of the education sessions and the implementation of the ACEs screening and referral process start date. A refresher tip sheet and protocol of the CRW referral process were presented and given to the providers physically and electronically before the later start date (see Appendix F for tip sheet).

Participants and Recruitment

Information regarding the ACEs education and screening process was presented to all providers at a monthly provider meeting. At this first meeting, all providers expressed verbal consent to participate. Implied consent also was obtained through the completion of the online pre-education knowledge survey and education session attendance. To be eligible for participation, those enrolled in the project were physicians, nurse practitioners, or physician's assistants at the practice, able to attend the education sessions, and English speaking. Ancillary practice personnel, those unable to attend the education sessions, and non-English speaking persons were excluded from this DNP project.

All children between the ages of one to 17 years were included in the annual ACEs screening. Infants under the age of one were excluded due to the high amount of screening tools that are used throughout the initial months of a patient's life. Patients over the age of 17 years should be transitioned to an adult PCP, and therefore, also were excluded from the screening. Both English and Spanish speaking patients were included as the ACE tool is available in both languages. Only de-identified data was included in the data collection through the electronic health record (EHR). Written consent was not required from patients or parents for this project.

Data Collection and Outcomes Measurement

Pre-Education and Post-Education Survey

Provider knowledge and attitudes regarding screening for ACEs were evaluated through a pre-education and post-education five-point Likert-scale survey. Content validity of the surveys was obtained through an expert panel analysis. The completed surveys were submitted electronically and anonymously. There was not any demographic data collected with the surveys and the IP address tracking was disabled.

EHR Reports

A baseline report from the EHR was provided by the practice's operations manager. The report included: the number of patients seen for a well check over the previous month, the number of ACE tools completed, and the number of referrals made to the CRW. This data report was completed on a monthly interval at four and eight weeks after the implementation of the screening process. These data were evaluated each month as a part of the "study" phase of the QI implementation framework (IHI, 2021). Following the QI framework, the data and program implementation should be continuously re-evaluated and necessary modifications are made. The outcome of interest is focused on how positive screens are managed; therefore, demographic data was not collected.

Data and Budget

Participant pre-and post-survey responses were entered into the data program Intellectus StatisticsTM. Statistical analysis was performed to compare the pre-and post-education survey results and determine any change in provider knowledge or attitude towards ACEs screening. An analysis was performed to determine any change in the percentage of screens performed on eligible children and referrals made from four weeks to eight weeks. The project findings were presented to the private practice and the CRW. No funding or grants were attained for this project; all costs involved in the project implementation were incurred by the project facilitator.

Project Results

Descriptive Data/Data Analysis Procedures

This DNP project used statistical analysis which was performed using Intellectus StatisticsTM software. The survey questions were divided into two categories: knowledge and attitudes. Descriptive statistics were used to identify the pre-education and post-education survey answer means and standard deviations for the knowledge and attitude questions. A

paired-samples *t*-test was used to analyze the knowledge outcomes variable and a Wilcoxon signed-rank test was used to analyze the attitudes outcomes variable. These tests determined whether there was a significant difference between the pre-and post-education survey answers. Descriptive statistics were utilized to assess for a change in screening and referral behaviors at four- and eight-weeks post-screening implementation.

Project Outcomes

Pre- and Post-Education Surveys

The knowledge question mean scores significantly increased from the pre-education survey ($M= 2.32, SD= 1.15$) to the post-education survey ($M = 3.76, SD = 0.50$). A paired-samples *t*-test showed a significant increase in knowledge from pre- to post-education survey based on an alpha of .05 ($t(4) = -4.52, p= .011$). A Wilcoxon signed-rank test showed that there was not a significant difference in provider attitudes from the pre- to post-education survey based on an alpha of .05 ($V= 0.00, z= -1.84, p= .066$). However, the mean scores of the attitude questions did increase from the pre- ($M= 2.76, SD 1.05$) to post-education survey ($M= 3.24, SD= 0.55$) (see Appendix G, graphs G1 and G2 for changes in provider knowledge and attitudes from pre-to post-education survey).

The post-education survey included open-ended questions to assess for education program strengths and improvement opportunities. One provider stated having access to the slides prior to the Zoom sessions would have been beneficial. Another provider suggested including more case studies and discussion of the practical application of ACEs screening. The case discussions and resource sharing were identified by the providers as valuable aspects of the education sessions.

EHR Report

A baseline report was run to ensure that ACEs screenings were not being completed before the official start date of the screening process. Screening for ACEs commenced after the four education sessions had been held. The baseline report, which reported on the four weeks before implementation, showed that 953 pediatric patients between the ages of 1 and 17 years were seen for well visits. Zero ACEs screenings were completed, and zero referrals were made to the CRW during this time. The four-week screening report showed that 661 pediatric patients, between the ages of 1 and 17 years were seen for well visits, with 75% successfully screened using the ACEs screening tool ($n=498$). Of the children screened, 6% ($n=30$) were referred to the CRW. The eight-week report showed 616 pediatric patients between the ages of 1 and 17 years were seen for well visits, with 56% successfully screening using the ACEs screening tool ($n=347$). Of the children screened during this time, 8.6% ($n=30$) were referred to the CRW (see Appendix G, graph G3 for a comparison of EHR data from four to eight weeks).

Discussion

Clinical Significance/Project Impact

The DNP project results indicate that the education sessions had a positive impact on improving provider knowledge about ACEs. However, the education sessions did not significantly change provider attitudes toward ACEs and the ACEs screening process. It is proposed, per the HBM, that provider attitude towards the screening will improve with time, as the severity and susceptibility of negative consequences of ACEs become clear through continued screening and as the providers recognize the benefit of referring their patients to the CRW (Rosenstock, 1974). Providers that are educated and comfortable treating children exposed to ACEs, will adopt screening processes more readily, which helps create a trauma-informed

environment of care (Kerker et al., 2016; Kia-Keating et al., 2019; Marie-Mitchell & Kostolansky, 2019; Popp et al., 2020; Rariden et al., 2021).

The ACE screening tool was offered to patients and families, who had the option of completing it or not. In the literature, providers reported that there was parental disinterest in completing the screening (Conn et al., 2017; Gillespie et al., 2017). However, 75% of eligible patients did complete the screening in the first four weeks. Although there was a decrease in the percentage of patients screened between four and eight weeks, from 75% to 56%, the same number of patients were referred to the CRW. The results indicate that most families were willing to participate in ACEs screenings and were open to referrals when needed, which aligns with research findings on parental acceptance of screening practices (Conn et al., 2017; Gillespie et al., 2017). Many patients or families do need resources, and those who do not require resources at the time of screening, now know that discussing these problems with their medical provider is acceptable and welcome. This not only enhances the patient-provider relationship, but also strengthens the community through the recognition of resource availability.

Ultimately, ACEs are an overarching public health crisis. Past traumas are vast and require a multifaceted strategy to combat the negative impact they can have on children and families. Both upstream solutions such as creating safe neighborhoods, easing the financial burden among families, ensuring affordable food and housing, and downstream solutions such as screening in primary care are necessary (ADHS, 2019).

Project Sustainability

This DNP project will be sustained through continued screening. The online education modules reviewing ACEs and the screening process will be made available to all new providers. The education modules can be completed by the providers along with other annual education

modules. This approach has been demonstrated to be cost-effective and elicits behavior change (Schmitz et al., 2019). There is a goal for this DNP project to be expanded to the other two office locations. Ultimately, screening and appropriately treating children exposed to ACEs fosters a culture with the clinics of trauma-informed care. This type of culture and environment will help sustain the screening process. As the screening program matures and providers become more comfortable with the process, screening for ACEs will become a routine part of their assessment. Since the screening does not add a significant amount of time to the patient visit, providers may find that the screening process is very sustainable. Additionally, the partnership between the practice and the CRW will help sustain this screening process. To effectively treat patients with high ACE exposure, primary care providers need to have somewhere to refer the patient so they may receive the resource access they need.

Limitations and Barriers

There were limitations to this quality improvement DNP project. The screening process was only implemented in one of the three clinics that are associated with the practice. Implementing screening throughout the practice may influence the results. Due to the COVID-19 pandemic, there was a significant delay in starting the ACEs screening process after the completion of the education sessions. Subjective provider feedback to the project facilitator during the screening process indicated that families were not interested in completing the screening. This subjective finding was relayed to the project facilitator despite the results indicating that most eligible patients were screened. Including educational posters in patient examination rooms for the families may improve participation by normalizing exposure to the topic.

Recommendations

Recommendations for evaluation include expanding the screening program to other clinical sites to evaluate a larger number of patients. It would be beneficial to determine if parental education about the screening process increases screening completion rates. Monitoring the longitudinal screening data, the patient's ACE score from year to year, along with the referral data could demonstrate whether access to resources improves patient and family resiliency. Another recommendation is to include referral follow-up to determine how many patients are not only referred to but are seen by the CRW or other community resources. Some patients may receive referrals for resources without being referred to the CRW. These alternative referrals were not assessed in this DNP project. Identifying these referrals would help identify additional needs of the pediatric patient population.

Adverse childhood experiences are detrimental to the lives of children, impacting their health and wellbeing well into adulthood. Pediatric primary care serves as an important environment in which to begin combatting ACEs exposure and to lessen the deleterious impact ACEs can have on children and families. An education program to improve provider knowledge is beneficial to improve ACEs screening practices in the office setting. Education offers a foundation of what ACEs are, how prevalent ACEs are among specific patient populations, what the potential consequences from exposure are, and most importantly, how children with ACE exposure should be managed. Education helps to eliminate barriers to screening, paving the way for a streamlined screening process that improves patient outcomes without increasing provider workload. This DNP project suggests that providing education before implementing an ACEs screening program improves provider knowledge and strengthens screening practices.

References

- Arizona Department of Health Services. (2019). *ADHS Adverse Childhood Experiences Action Plan*. <https://azdhs.gov/documents/operations/managing-excellence/breakthrough-plans/aces-breakthrough-plan.pdf>
- Arizona Department of Health Services. (2021a). *Avondale primary care area (PCA): 2020 statistical profile*. <https://www.ADHS.gov/documents/prevention/health-systems-development/data-reports-maps/primary-care/maricopa/64.pdf>
- Arizona Department of Health Services. (2021b). *Laveen village primary care area (PCA): 2020 statistical profile*. <https://www.ADHS.gov/documents/prevention/health-systems-development/data-reports-maps/primary-care/maricopa/40.pdf>
- Arizona Department of Health Services. (2021c). *Maryvale village primary care area (PCA): 2020 statistical profile*. <https://ADHS.gov/documents/prevention/health-systems-development/data-reports-maps/primary-care/maricopa/36.pdf>
- Baldwin, J. R., Caspi, A., Meehan, A. J., Ambler, A., Arsenuault, L., Fisher, H. L., Harrington, H., Matthews, T., Odgers, C. L., Poulton, R., Ramrakha, S., Moffitt, T. E., & Danese, A. (2021). Population vs individual prediction of poor health from results of adverse childhood experiences screening. *JAMA Pediatrics*, 1-9.
<https://doi.org/10.1001/jamapediatrics.2020.5602>
- Centers for Disease Control and Prevention. (2021). *Leading causes of death*. <https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm>
- Centers for Disease Control and Prevention. (2019). *Adverse childhood experiences (ACEs)*. <https://www.cdc.gov/vitalsigns/aces/index.html>

- Conn, A. M., Szilagyi, M. A., Jee, S. H., Manly, J. T., Briggs, R., & Szilagyi, P. G. (2018). Parental perspectives of screening for adverse childhood experiences in pediatric primary care. *Families, Systems, & Health, 36*(1), 62-72. <https://doi.org/10.1037/fsh0000311>
- Crouch, E., Radcliff, E., Brown, M., & Hung, P. (2019a). Exploring the association between parenting stress and a child's exposure to adverse childhood experiences (ACEs). *Children and Youth Services Review, 102*(1), 186-192. <https://doi.org/10.1016/j.childyouth.2019.05.019>
- Crouch, E., Radcliff, E., Strompolis, M., & Srivastav, A. (2019b). Safe, stable, and nurtured: Protective factors against poor physical and mental health outcomes following exposure to adverse childhood experiences (ACEs). *Journal of Child & Adolescent Trauma, 12*(2), 165–173. <https://doi.org/10.1007/s40653-018-0217-9>
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine, 14*(4), 245–258. [https://doi.org/10.1016/S0749-3797\(98\)00017-8](https://doi.org/10.1016/S0749-3797(98)00017-8)
- Giovanelli, A., Reynolds, A. J., Mondi, C. F., & Ou, S.-R. (2016). Adverse childhood experiences and adult wellbeing in a low-income, urban cohort. *Pediatrics, 137*(4), 1-11. <https://doi.org/10.1542/peds.2015-4016>
- Gillespie, R. J., & Folger, A. T. (2017). Feasibility of assessing parental ACEs in pediatric primary care: Implications for practice-based implementation. *Journal of Child and Adolescent Trauma, 10*(3), 249-256. <https://doi.org/10.1007/s40653-017-0138-z>

Institute for Healthcare Improvement. (2021). *Science of improvement: Testing changes*.

<http://www.ihl.org/resources/Pages/HowtoImprove/ScienceofImprovementTestingChanges.aspx>

Kerker, B. D., Storfer-Isser, A., Szilagyi, M., Stein, R. E. K., Garner, A. S., O'Connor, K. G., Hoagwood, K. E., & Horwitz, S. M. (2016). Do pediatricians ask about adverse childhood experiences in pediatric primary care? *Academic Pediatrics, 16*(2), 154-160.

<https://doi.org/10.1016/j.acap.2015.08.002>

Kia-Keating, M., Barnett, M. L., Liu, S. R., Sims, G. M., & Ruth, A. B. (2019). Trauma-responsive care in a pediatric setting: Feasibility and acceptability of screening for adverse childhood experiences. *American Journal of Community Psychology, 64*(3-4), 286-297. <https://doi.org/10.1002/ajcp.12366>

Marie-Mitchell, A., & Kostolansky, R. (2019). A systematic review of trials to improve child outcomes associated with adverse childhood experiences. *American Journal of Preventative Medicine, 56*(5), 756-764. <https://doi.org/10.1016/j.amepre.2018.11.030>

Marsicek, S. M., Morrison, J. M., Manikonda, N., O'Halleran, M., Spoehr-Labutta, Z., & Brinn, M. (2019). Implementing standardized screening for adverse childhood experiences in a pediatric resident continuity clinic. *Pediatric Quality & Safety, 4*(2), 1-8.

<https://doi.org/10.1097/pq9.0000000000000154>

Melnyk, B. M., & Fineout-Overhold, E. (2019). Making the case for evidence-based practice and cultivating a spirit of inquiry. In Melnyk, B. M., & Fineout-Overhold, E. (Eds.), *Evidence-based practice in nursing and healthcare* (4th ed., pp 7-32). Wolters Kluwer.

- Petrucelli, K., Davis, J., & Berman, T. (2019). Adverse childhood experiences and associated health outcomes: A systematic review and meta-analysis. *Child Abuse & Neglect, 97*(1), 1-13. <https://doi.org/10.1016/j.chiabu.2019.104127>
- Phoenix Children's Hospital. (2021). *Center for Resiliency and Wellbeing (CRW)*. <https://phoenixchildrens.org/CRWP>
- Popp, T. K., Geisthardt, C., & Bumpus, E. A. (2020). Pediatric practitioners' screening for adverse childhood experiences: Current practice and future directions. *Social Work in Public Health, 32*(1-2), 1-10. <https://doi.org/10.1080/19371918.2020.1711839>
- Rariden, C., SmithBattle, L., Yoo, J. H., Cibulka, N., & Loman, D. (2021). Screening for adverse childhood experiences: literature review and practice implications. *The Journal for Nurse Practitioners, 17*(1), 98–104. <https://doi.org/10.1016/j.nurpra.2020.08.002>
- Rosenstock, I. M. (1974). Historical origins of the health belief model. *Health Education Monographs, 2*(4), 328-335. <https://doi.org/10.1177/109019817400200403>
- Schmitz, A., Light, S., Barry, C., & Hodges, K. (2019). Adverse childhood experiences and trauma-informed care: An online module for pediatricians. *AAMC Journal of Teaching and Learning Resources, 15*(1), 1-8. https://doi.org/10.15766/mep_2374-8265.10851
- United States Department of Health and Human Services. (n.d.). *Child and adolescent development*. <https://health.gov/healthypeople/objectives-and-data/browse-objectives/child-and-adolescent-development>
- World Health Organization. (2021). *Noncommunicable diseases*. <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>

Appendix A
Evaluation and Synthesis Tables

Table A1

Quantitative Study Evaluation Table

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Evidence Level/ Application
(Crouch et al., 2019a). Exploring the association between parenting stress and a child's exposure to adverse childhood experiences (ACEs). Country: US Funding: n/a Bias: Possible social desirability and detection bias	Developmental Ecological Child Maltreatment Model	Design: Cross-sectional survey Purpose: To examine whether increases levels of parenting stress are associated with higher counts of ACEs among children.	n = 45,831 survey respondents Demographics: -50.9% male between 6-17 years of age -53.6% non-Hispanic White -20% had special healthcare needs Setting: -Homes in varying poverty levels Exclusion: -Parents or caregivers of children > 17 years of age -Parents/caregivers of children living outside of the home Response Rate: Data from 2016 National Survey of Children's Health	IV1: Poverty level IV2: Child with special healthcare needs IV3: Family structure IV4: Age/ demographics DV1: Increased level of parental stress DV2: >4 ACEs Definitions: -ACES: parental separation/ divorce, parental death, incarceration, violence, MI, SA, racial/ethnic mistreatment, economic hardship	Tools: -Quantitative scale -Likert-scale questions Validity/ Reliability: -Reliable and valid	-Chi square tests, $\alpha = 0.01$ (due to large sample size) -Multi-variate logistic regression models	DV1: Increased level of parental stress Male children -5.7% vs. 4.1%, $p = .0015$ Older children -6.6% vs. 5.1%, 3.3% (children 13-17, 6-12, <5), $p < .0001$ Hispanic children -6% vs. 4.3%, $p = .04$ Income below federal poverty line -6.6% vs. 3.8-6.6% vs. 3.8%, $p = .0011$ DV2: >4 ACES Parental stress in the home -OR 3.05, -95% CI 2.23-4.15	LOE: IV (Melnik & Fineout-Overholt) Strengths: -Large sample size Weaknesses: -Does not ask about emotional, physical, or sexual abuse -Address based, may limit sample Conclusion: Addressing family and parenting stress can improve the health outcomes of children. Feasibility: Parenting stress interventions and emphasizing parent/child relationships is a feasible task for primary care.

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Evidence Level/ Application
			with 50,212 complete interviews. Those that answered all ACES questions were included.				Age 6-17 -OR 4.07 -95%, CI = 3.12-5.31 Special health care needs -OR 1.79 -95%, CI = 1.46-202 Primary language not English -OR 0.32 -95% CI = 0.18-0.53	
(Crouch et al., 2019b). Safe, stable, and nurtured: protective factors against poor physical and mental health outcomes following exposure to adverse childhood experiences (ACEs) Country: US Funding: n/a	Resiliency Theory and Protective Factors Model	Design: Retrospective cross-sectional Purpose: To examine the relationship between protective factors (SSNRs) in childhood and physical/ mental health outcomes among adult who experienced ACEs	n= 7,079 Demographics: -51.9% female -59.9% non-Hispanic white -59.9% had some college education -41% made \$50,000+ a year -20% reported 4+ ACEs Setting: -Cell phone and home phones used to collect data for oringal survery Exclusion:	IV1: # of ACEs IV2: Reported protective factors DV1: Self-reported health DV2: Self-reported MD Definitions: -ACEs: MI, SA, incarceration, separation/divorce , physical or emotional abuse, sexual abuse -Protective factors: an adult that made child	Tools: -Multiple choice and yes/no survey questions -ACE survey model Validity/ Reliability: -Reliable and valid	-Chi-square tests α – 0.05 -Multi-variate regression models	DV1: Self-reported health ≥ 4 ACEs and poor health -25.2% vs. 15.2& p < 0.001 -OR: 2.08 -95% CI = 2.06-2.09 Odds of poor health with ≥ 4 ACEs and protective adult some-most of the time: -OR: 0.61 -95% CI = 0.60-0.62	LOE: IV (Melnik & Fineout-Overholt) Strengths: -First to examine protective factors -Data is weighted to represent the state Weaknesses: -Survey only performed in one state, may not be generalizable -Cross sectional -Self-reported -Small proportion had > 4 ACEs

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Evidence Level/ Application
<p>Bias: Possible recall bias and social desirability bias</p>			<p>-Surveys that did not have completed ACE modules -Original survey excluded < 18 years old and institutionalized persons</p> <p>Response Rate: Data from 2016 South Carolina Behavioral Risk Factor Surveillance System was used</p>	<p>feel safe/protected, an adult that made sure basic needs were met</p>			<p>Odds of poor health with ≥ 4 ACEs and protective adult all of the time -OR: 0.60 -95% CI = 0.59-0.62</p> <p>Odds of poor health with ≥ 4 ACEs and basic needs met -OR: 0.84 -95% CI = 0.82-0.87</p> <p>DV2: Self-reported MD</p> <p>≥ 4 ACEs and MD -26.2% vs. 9.9%, $p < 0.001$</p> <p>Odds of frequent MD with ≥ 4 ACEs with protective adult some to most of the time -OR: 3.05 -95% CI 3.02-3.07</p> <p>Odds of frequent MD with ≥ 4 ACEs with basic needs met -OR: 0.84</p>	<p>Conclusion: Exposure to 4+ ACEs and long-term health/MD were moderated by having protective adult in their lives and when the adult provided for the child’s basic needs.</p> <p>Feasibility: Promoting parent/child relationships and providing resources to aid families in meeting basic needs is feasible and cost-effective in primary care.</p>

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Evidence Level/ Application
							-95% CI = 0.82-0.87	
(Gillespie et al., 2017). Feasibility of assessing parental ACEs in pediatric primary care: implications for practice-based implementation. Country: US Funding: n/a Bias: Possible social desirability bias	Not stated, inferred Theory of Caregiver Dynamics	Design: Cohort study Purpose: To evaluate the feasibility of implementing an assessment tool for parental ACES in a pediatric office, to determine parental preference for disclosure, and to assess provider acceptance of parental assessment.	n= 2283 parents representing 1780 children -1308 completed item-level tool -975 completed aggregate tool Demographics: Based on chart review of partial sample (460 patients): -52.2% White -16.1% Hispanic -8.7% Asian -1.1% African American -1% American Indian and Pacific Islander Setting: -Private, single-specialty pediatric office in Portland Oregon Exclusion: -Parents of children not at 4-month-old checkup -Did not complete full survey	IV1: Type of survey (item-level vs aggregate) IV2: Parent completing survey (mother vs father) DV: ≥ 1 ACE reported DV2: ≥ 4 ACEs reported Definitions: -ACEs: physical, sexual, and emotional abuse, neglect, and household dysfunction	Tools: -ACE screening tool Validity/ Reliability: -Reliable/valid	-Chi square ($\alpha = < 0.05$)	DV1: ≥ 1 ACE reported -47% using item level vs 48.3% using aggregate (p = 0.668) -49.6% Mothers using item level vs 49.2% using aggregate (p = 0.894) -41.5% Fathers using item level vs 48% using aggregate (p = 0.115) DV2: ≥ 4 ACEs reported -8.1% using item-level vs 11.2% using aggregate (p = 0.0013) -8.9% Mothers using item level vs 12.3% using aggregate (p = 0.028) -6.2% Fathers using item-level vs 9.2% using aggregate (p = 0.167) <i>Qualitative findings/themes</i>	LOE: IV (Melnik & Fineout-Overholt) Strengths: -Showed positive reaction from both parents and providers to screening Weaknesses: -Demographic information is limited, may not be generalizable to other populations Conclusion: Parents are more comfortable disclosing information about ACEs using an aggregate tool. Feasibility: Parental ACEs screening is feasible, adds little time to the assessment, and improves patient/provider communication

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Evidence Level/ Application
			<p>Response Rate/Attrition: -8 surveys excluded from overall analysis due to missing ACE score -120 surveys excluded from parent type analysis due to missing identification</p>				<p>-Willingness of parents to discuss ACEs -Enhanced relationship with parent -Minimal additional time to discuss</p>	<p>regarding resources and parenting skills.</p>
<p>(Kerker et al., 2016). Do pediatricians ask about adverse childhood experiences in pediatric primary care? Country: US Funding: Supported in part by the AAP Bias: Possible response bias for professionally desirable behaviors</p>	<p>Not stated, inferred Knowledge, Attitude, and Practice Framework was used</p>	<p>Design: Cross-sectional Purpose: To determine how often pediatricians screen for ACEs and which factors have a positive impact on screening rates</p>	<p>n= 302 Demographics: -Age: 46 years on average -68% women -74.5% Caucasian Setting -51% Suburban practice -39% Urban -10% Rural Exclusion -Worked outside of general pediatrics -Still in training Response Rate -37% response rate -51% of responses qualified for the sample</p>	<p>IV1: Socio-demographic IV2: Practice Characteristics IV3: Education DV: ACEs Practice Definitions: -ACEs: maternal depression, parental separation/divorce, physical or sexual abuse, hostile/rejecting parenting by mothers, domestic violence exposure, parental SA and incarcerated relative</p>	<p>Tools: -Likert-scale questionnaire Validity/Reliability: -Reliable and valid</p>	<p>-Rao-Scott chi square test -Weighted linear regression -Weighted multi-variable logistic regression</p>	<p>DV: ACEs practice Advice from pediatricians influences parenting -P value = 0.0095 -OR = 2.19 -95% CI = 1.21, 3.97 Screening is beyond the scope of the pediatric medical home -P value = 0.0061 -OR = 2.42 -95% CI = 1.29, 4.56 Interested in more education -P = 0.0058 -OR = 2.13 -95% CI = 1.25, 3.65</p>	<p>LOE: IV (Melnik & Fineout-Overholt) Strengths: -Results weighted to reduce nonresponse bias Weaknesses: -Cross sectional, does not imply causality -Suboptimal response rate Conclusion: Pediatricians' personal beliefs/ attitudes influence screening practices and can be improved through education. Feasibility: Screening is a cost-</p>

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								effective intervention.
(Kia-Keating et al., 2019). Trauma-responsive care in a pediatric setting: feasibility and acceptability of screening for adverse childhood experiences Country: US Funding: Grants Bias: Possible social desirability bias and response bias	CBPR and human-centered design	Design: Mixed methods—descriptive and qualitative semi-structured interviews Purpose: Feasibility and acceptability of ACEs screening in a medical setting with majority of low-income and Latinx patients	n= 164 infants and parents eligible for screening, 151 screened Demographics: -50.3% female -76.8% Latinx Setting: -Medical clinic serving low-income and Latinx population Exclusion: -Children < 4 months and > 12 months Attrition: 13	IV1: # of children (and parents) eligible for screening IV2: Parent with ≥ 1 ACEs IV3: Child with ≥ 1 ACEs IV4: Parental agreement to receive services DV1: # of screens performed DV2: Referral to services/ connection to resources Definitions: -ACEs: abuse, neglect, household dysfunction -Adverse community experiences: discrimination, violence, natural disaster	Tools: -Chart review -Semi-structured interviews Validity/ Reliability: -Reliable and valid	-Descriptive statistics	DV1: # screens performed -151 screen performed out of 164 eligible patients (92.1%) DV2: Referral to services/connection to resources -47% met criteria for prevention services -77.4% (n=55) of eligible parents consented to receive services -14.1% declined <i>Qualitative findings/themes</i> -Screening is acceptable/feasible and has benefits -Screening improves understanding of a family -Connection between physical/mental health -Interest in ongoing education	LOE: V (Melnik & Fineout-Overholt) Strengths: -Assessed implementation barriers/facilitators -Used range of implementation strategies Weaknesses: -Single setting study -Small sample size Conclusion: It is feasible to screen for ACEs in primary care. Providers' attitude shifted through education and implementation of screening. Feasibility: Screening in primary care is feasible and beneficial.
(Marie-Mitchell et al.,	Not stated, inferred	Design: SR of RCTs	n= 22 articles describing 20 RCTs	IV1: Parent risk factors	Tools:	PRISMA, US	IV1: Most common risk factor	LOE: I (Melnik & Fineout-Overholt)

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2019). A systematic review of trials to improve child outcomes associated with adverse childhood experiences. Country: US Funding: n/a Bias: Possible publication bias	Theory of Caregiver Dynamics	Purpose: To summarize current evidence based on RCTs for effective interventions to prevent poor health outcomes among children exposed to ACEs	Demographics: -Pediatric population utilizing healthcare services (pediatric primary care, maternal-child health, general practice, and community health nursing) Setting: -Various Exclusion: -Studies published before 1/1/90 or after 12/31/17 -Not RCT -Adult population -Not screened for ACEs or not recruited based on exposure to ACEs	IV2: Community service utilization IV3: Parent child relationship DV: Improved health outcomes for children exposed to ACES Definitions: -ACEs: maltreatment, domestic violence, household with MI, household SA, incarcerated household member, divorced/ separated parents -Child health outcomes: behavioral health, developmental or cognitive functioning, physical/ chronic health problems, child biomarkers	-Not stated; various Validity/ Reliability: -n/a	Preventative Task Force quality rating Guidelines	was depression (16 studies), then parent alcohol/ drug abuse (15 studies), and domestic violence (12 studies) IV2: Studies that included pediatric healthcare services (14 studies) IV3: Parent-child relationship (14 studies) DV: Improved health outcomes -1 of 3 studies measured improved outcomes with mental health treatment -7 of 12 studies measured improved outcomes with healthcare utilization -12 of 14 studies showed improvement when parent-child relationship was assessed	Strengths: -Consistent with other reviews on child maltreatment Weaknesses: -Only two studies identified as good quality, the remainder were fair quality -Lack of information on children >6 years old Conclusion: Risk assessment of patient and child, family centered teaching, and utilization of healthcare providers and services can reduce impact of ACEs on child health outcomes. Feasibility: Family centered care and education is a feasible way improve child health outcomes.
(Popp et al., 2020). Pediatric	Not stated, inferred Knowledge,	Design: Cross-sectional	n= 48 Demographics:	IV1: Familiarity/ education on ACES	Tools: -Multiple choice survey	- Pearson Chi Square	DV: ACES screening performed	LOE: IV (Melnik & Fineout-Overholt)

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Evidence Level/ Application
<p>practitioners' screening for adverse childhood experiences: current practices and future directions.</p> <p>Country: US— Midwestern state</p> <p>Funding: n/a</p> <p>Bias: Possible response bias</p>	<p>Attitude, and Practice Framework was used</p>	<p>Purpose: To determine practitioners' practices and beliefs about ACE screening, supporting factors and barriers to screening, and current nature of practices</p>	<p>-65% female -85% Caucasian -4% American Indian -11% Asian/Pacific Islander -Years in practice 1-37 (M = 14.5, SD = 10.7) -65% MD -11% DO -24% PA</p> <p>Setting: -70% rural settings</p> <p>Exclusion: -Incomplete surveys -Occupation outside of MD, DO, PA</p> <p>Response Rate: -7% response rate -94% of responses qualified for the sample</p>	<p>IV2: Perceived responsibility to screen and provide resources on individual ACEs</p> <p>IV3: Types of screening tools/techniques used</p> <p>IV4: Perceived barriers</p> <p>DV: ACEs screening performed</p> <p>Definitions: -ACES: caregiver divorce, incarceration, SA, domestic violence, MI/ suicidality; neighborhood violence, emotional neglect, physical or sexual abuse, emotional/psychological abuse, criminal activity in the home, financial struggles</p>	<p>Validity/ Reliability: -Reliable and valid</p>		<p>-Familiarity with ACES: $X^2(1, N=43) = 8.87, p < .01$ -Received ACES training: $X^2(1, N=41) = 9.90, p < .01$</p>	<p>Strengths: -Findings are consistent with previous literature</p> <p>Weaknesses: -Small sample size, only conducted in one state -Low response rate</p> <p>Conclusion: Providers are more likely to screen if they have received education and training on ACES screening and are familiar with the available research.</p> <p>Feasibility: Provider education is a feasible way to improve screening practices.</p>

Key: **ACE** = adverse childhood experience; **AAP** = American Association of Pediatrics; **AUC** = area under the curve; **CBPR** = community based participatory research; **CI** = confidence interval; **DO** = Doctors of Osteopathic Medicine; **DV** = dependent variable; **IV** = independent variable; **LOE** = level of evidence; **M** = median; **MD** = Medical Doctors; **MI** = mental illness; **n** = number; **OR** = odds ratio; **PA** = Physician's assistant; **RCT** = randomized controlled trial; **RR** = relative risk; **SA** = substance abuse; **SD** = standard deviation; **SSNR** = safe, stable, & nurturing relationship; **SR** = systematic review; **TIC** = trauma informed care; **US** = United States

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Evidence Level/ Application
(Rariden et al., 2021). Screening for adverse childhood experiences: Literature review and practice implications. Country: US Funding: n/a Bias: Possible social desirability bias and response bias	Not stated, inferred Knowledge, Attitude, and Practice Framework was used	Design: SR of observational, mixed method, descriptive, and qualitative studies Purpose: To examine acceptability and feasibility of implementing ACE screenings from the perspective of clinicians and patients	n= 13 studies (458 clinicians, 5,997 patient or parent Demographics: -Various Setting -5 studies in pediatrics -3 in adult primary care -2 perinatal setting -2 in patient homes -1 in academic setting Exclusion: -Studies not performed in US -Did not include implementation, acceptability, or feasibility -Not peer reviewed	IV1: Acceptability of ACE screening by patients and clinicians IV2: Perceived feasibility of ACE screening DV: Implementation of ACE screening	Tools: -Various Validity/ Reliability: -n/a	Independent review of texts by two reviewers	IV1: Acceptability -Parent acceptability (5 studies) -Provider acceptability (7 studies) IV2: Feasibility -Provider anxiety before screening which was relieved by education and experience -No major time disruptions with timing and workflow (9 studies) DV: Implementation of ACE screening -Increased with positive perception of acceptability and feasibility	LOE: I (Melnik & Fineout-Overholt) Strengths: -Similar findings across studies Weaknesses: -Small number of studies -Varied settings, may not be specific to pediatrics Conclusion: Most patients are willing to participate in ACEs screening. Education for providers can help improve the process and provide meaningful referrals. Feasibility: Screening was less time intensive than anticipated. Comfort level increased with education.
Schmitz et al., 2019). Adverse childhood experiences	Not stated, inferred Knowledge, Attitude, and Practice	Design: Purpose: To determine the impact of an	n= 11 Demographics: -not stated	IV1: Baseline knowledge/beliefs	Tools: -Likert scale Validity/ Reliability:	-Wilcoxon signed rank test	DV1: Post-module confidence in knowledge -ACEs: increased from 3-4 (p < .05)	LOE: IV (Melnik & Fineout-Overholt) Strengths:

Key: **ACE** = adverse childhood experience; **AAP** = American Association of Pediatrics; **AUC** = area under the curve; **CBPR** = community based participatory research; **CI** = confidence interval; **DO** = Doctors of Osteopathic Medicine; **DV** = dependent variable; **IV** = independent variable; **LOE** = level of evidence; **M** = median; **MD** = Medical Doctors; **MI** = mental illness; **n** = number; **OR** = odds ratio; **PA** = Physician’s assistant; **RCT** = randomized controlled trial; **RR** = relative risk; **SA** = substance abuse; **SD** = standard deviation; **SSNR** = safe, stable, & nurturing relationship; **SR** = systematic review; **TIC** = trauma informed care; **US** = United States

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/ Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Evidence Level/ Application
<p>and trauma-informed care: An online module for pediatricians</p> <p>Country: US</p> <p>Funding: Medical College of Wisconsin and a grant from SaintA Foundation</p> <p>Bias: Possible social desirability bias</p>	<p>Framework was used</p>	<p>ACEs education module on pediatric residents' comfort and knowledge screening patients.</p>	<p>Setting: -Majority worked in suburban private practice - > 50% of patients had Medicaid</p> <p>Exclusion: -Physicians who were not residents -Physicians who do not work in pediatrics</p> <p>Response Rate: -32% completed the baseline survey -11% completed the post-module survey</p>	<p>DV: Post-module confidence in knowledge</p> <p>DV2: Behavior change</p> <p>Definitions: -Knowledge: includes ACEs, TIC, toxic stress, and resiliency -Behavior change: includes discussion of ACES, TIC, toxic stress, and resiliency</p>	<p>-Reliable and valid</p>		<p>-TIC: increased from 2-4 (p < .05) -Toxic stress: increase from 2-3 (p < .05) -Resiliency: increased from 3-4 (p < .05)</p> <p>DV2: Behavior change -ACEs: increased from 28%-42% -TIC: increased from 13%-42% -Toxic stress: increased from 27%-42% -Resiliency discussion: increased from 25%-50% -(p < .01 for all matched pairs)</p>	<p>-Online learning module can easily be incorporated into a variety of settings</p> <p>Weaknesses: -Small sample size -May not be generalizable</p> <p>Conclusion: Residents demonstrated a behavior change in practice after receiving education on ACEs, TIC, toxic stress, and resiliency.</p> <p>Feasibility: An online education module is cost-effective and results in behavior change</p>

Key: **ACE** = adverse childhood experience; **AAP** = American Association of Pediatrics; **AUC** = area under the curve; **CBPR** = community based participatory research; **CI** = confidence interval; **DO** = Doctors of Osteopathic Medicine; **DV** = dependent variable; **IV** = independent variable; **LOE** = level of evidence; **M** = median; **MD** = Medical Doctors; **MI** = mental illness; **n** = number; **OR** = odds ratio; **PA** = Physician's assistant; **RCT** = randomized controlled trial; **RR** = relative risk; **SA** = substance abuse; **SD** = standard deviation; **SSNR** = safe, stable, & nurturing relationship; **SR** = systematic review; **TIC** = trauma informed care; **US** = United States

Table A2

Evaluation of Qualitative Studies

Citation	Conceptual Framework	Design/ Method/ Sampling	Sample/Setting (describe)	Major Variables Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Evidence Level/Practice Application
<p>(Conn et al., 2017). Parental perspectives of screening for adverse childhood experiences in pediatric primary care.</p> <p>Country: US</p> <p>Funding: n/a</p> <p>Bias: Possible self-selection bias</p>	<p>Not stated, inferred Health Belief Model</p>	<p>Design: Deductive qualitative design</p> <p>Purpose: To explore the parent perspective of ACEs screening in primary care, understand parental perspectives on intergenerational transmission of ACEs, and identify opportunities for pediatric anticipatory guidance</p>	<p>n= 15</p> <p>Demographics: -98% female -46% Black or African American -42% between 18-25 years old -Of the 8 parents who completed ACEs screening 63% had four or more ACEs</p> <p>Setting: -Urban pediatric practice</p> <p>Exclusion: -Parents < 18 years old -Children > 6 years old</p> <p>Recruitment: -Passively recruited in waiting room of practice with flyers, interested parents were then screened for inclusion -Analyzed after 12 participants, then added 3 at a time until saturation was met</p>	<p>1. Perception of screening for parent and child ACEs in pediatrics</p> <p>2. Perception of the influence of parental adversity on child development</p> <p>3. Suggestions for interventions for children/ families with ACEs</p> <p>Definitions: -ACEs: Physical, emotional, sexual abuse; physical or emotional neglect; MI, mother treated violently, or divorce</p>	<p>Tools: -Individual semi-structure interviews</p> <p>Validity/ Reliability: -Thematic saturation was reached</p>	<p>-Guided interviews coded by multiple researches -Use of cross-classification matrix</p>	<p><i>Themes:</i></p> <p>1. Parents were accepting of ACEs screening in the context of a trusting relationship and perceived many benefits (eliciting family needs, external resources to meet needs, promoting parent-provider relationship)</p> <p>2. Parents were more open to screening for their children’s ACEs instead of their own</p> <p>3. Person-centered screening strategies (face-to-face screening, explaining the purpose of the screening)</p> <p>4. Many parents desired to break the cycle of adversity and do things differently with their children</p>	<p>LOE: VI (Melnik & Fineout-Overholt)</p> <p>Strengths: -Interviews were completed or supervised by doctoral level professionals with clinical expertise in ACEs -Thematic saturation reached</p> <p>Weaknesses: -Small sample size -Socioeconomic characteristics</p> <p>Application: Parents are supportive of screening and desire change for their children. Their view of pediatricians as change agents indicates that anticipatory guidance can</p>

Key: **ACE** = adverse childhood experience; **LOE** = level of evidence; **n** = number; **US** = United States

Citation	Conceptual Framework	Design/ Method/ Sampling	Sample/Setting (describe)	Major Variables Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Evidence Level/Practice Application
			-Attrition: 0				5. Pediatricians are viewed as change-agents	have a meaningful impact.

Table A3

Synthesis Table

Study	<i>Conn et al., 2017</i>	<i>Crouch et al., 2019a</i>	<i>Crouch et al., 2019b</i>	<i>Gillespie et al., 2017</i>	<i>Kerker et al., 2016</i>	<i>Kia-Keating et al., 2019</i>	<i>Marie-Mitchell et al., 2019</i>	<i>Popp et al., 2020</i>	<i>Rariden et al., 2021</i>	<i>Schmitz et al., 2019</i>
Design/LOE	Qual, VI	CS, IV	CS, IV	Cohort, IV	CS, IV	MM, V	SR, I	CS, IV	SR, I	Cohort, IV
Sample										
n subjects	15	45,831	7,049	2,283	302	164	22	48	13	11
Country	US	US	US	US	US	US	US	US	US	US
Setting										
Home		X	X					X		
Practice	X			X	X	X				X
Various							X		X	
Measurement Tools										
Survey		X	X		X			X		X
ACE Tool				X						
Chart Review						X				
Interviews	X					X				
Various							X		X	
Framework	HBM	DECMM	RT and PFM	TCD	KAPF	CBPR	TCD	KAPF	KAPF	KAPF
IV										
SDF	X	X			X					
Family	X	X		X	X		X			
# ACES			X			X				
Protective Factors			X				X			

Key: **ACE** = adverse childhood experience; **CBPR** = Community Based Participatory Research; **CS** = cross-sectional; **DECMM** = Developmental Ecological Child Maltreatment Model; **DV** = dependent variable, **Edu** = education; **HBM** = Health Belief Model; **IV** = independent variable; **KAPF** = Knowledge, Attitude, and Practice Framework; **LOE** = level of evidence; **MM** = mixed methods; **n** = number; **PCP** = primary care provider; **PFM** = Protective Factors Model; **Qual** = qualitative; **RT** = Resiliency Theory; **SDF** = sociodemographic factors; **SR** = systematic review; **TCD** = Theory of Caregiver Dynamics; **US** = United States

ADERVSE CHILDHOOD EXPERIENCE SCREENING

Study	<i>Conn et al., 2017</i>	<i>Crouch et al., 2019a</i>	<i>Crouch et al., 2019b</i>	<i>Gillespie et al., 2017</i>	<i>Kerker et al., 2016</i>	<i>Kia-Keating et al., 2019</i>	<i>Marie-Mitchell et al., 2019</i>	<i>Popp et al., 2020</i>	<i>Rariden et al., 2021</i>	<i>Schmitz et al., 2019</i>
Type of screening	X			X				X		
Education					X			X		
Screening beliefs	X				X			X	X	X
Dependent Variable										
Parental Stress		X								
> 4 Aces		X		X						
Self-reported health			X							
ACEs practice					X	X		X	X	X
Improved health							X			
Outcomes										
Edu improves screening/beliefs					X	X	X	X	X	X
Family approach improves outcomes	X	X	X		X	X	X		X	
Screening improved relationships	X			X		X	X		X	
Family acceptance of screening	X			X						

Key: **ACE** = adverse childhood experience; **CBPR** = Community Based Participatory Research; **CS** = cross-sectional; **DECMM** = Developmental Ecological Child Maltreatment Model; **DV** = dependent variable, **Edu** = education; **HBM** = Health Belief Model; **IV** = independent variable; **KAPF** = Knowledge, Attitude, and Practice Framework; **LOE** = level of evidence; **MM** = mixed methods; **n** = number; **PCP** = primary care provider; **PFM** = Protective Factors Model; **Qual** = qualitative; **RT** = Resiliency Theory; **SDF** = sociodemographic factors; **SR** = systematic review; **TCD** = Theory of Caregiver Dynamics; **US** = United States

Appendix B

Models and Frameworks

Figure B1

Health Belief Model

Rosenstock (1974)

Figure B2

Quality Improvement Framework

IHI (2021)

Appendix C

Approval Letters

Letter C1

Initial IRB Approval Letter



APPROVAL: EXPEDITED REVIEW

[Diana Jacobson](#)
 EDSON: DNP
 602/496-0863
 DIANA.JACOBSON@asu.edu

Dear [Diana Jacobson](#):

On 8/3/2021 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Incorporating Adverse Childhood Experience Screening into Pediatric Primary Care
Investigator:	Diana Jacobson
IRB ID:	STUDY00014193
Category of review:	(7)(a) Behavioral research
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • ACES_Protocol_V2, Category: IRB Protocol; • Chaisson_CITI_certificate, Category: Other; • CoverLetter_ImpliedConsent_V2, Category: Consent Form; • CRW_ACESTool_English, Category: Screening forms; • CRW_ACESTool_Spanish, Category: Screening forms; • CRW_EducationOverview, Category: Other; • CRW_Patient_posters, Category: Other; • CRW_SampleScript, Category: Participant materials (specific directions for them); • DataReport_Form, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Email-PrePost_Survey, Category: Recruitment Materials; • Email-PrePost_Survey_Reminder, Category:

	Recruitment Materials; • Jacobson_CITI_certificate, Category: Other; • MVP_IntroScript_ProviderMeeting, Category: Recruitment Materials; Recruitment Materials; • MVP_Support_Letter, Category: Other; • PostEducation_Survey, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • PreEducation_Survey, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Resources.zip, Category: Resource list;
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The IRB approved the protocol from 8/3/2021 to 8/2/2022 inclusive. Three weeks before 8/2/2022 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 8/2/2022 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the “Documents” tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

REMINDER - All in-person interactions with human subjects require the completion of the ASU Daily Health Check by the ASU members prior to the interaction and the use of face coverings by researchers, research teams and research participants during the interaction. These requirements will minimize risk, protect health and support a safe research environment. These requirements apply both on- and off-campus.

The above change is effective as of July 29th 2021 until further notice and replaces all previously published guidance. Thank you for your continued commitment to ensuring a healthy and productive ASU community.

Sincerely,

IRB Administrator

cc: Charlotte Chaisson
 Charlotte Chaisson
 Diana Jacobson

Letter C2

IRB Modification Approval Letter



APPROVAL: MODIFICATION

[Diana Jacobson](#)
 EDSON: DNP
 602/496-0863
 DIANA.JACOBSON@asu.edu

Dear [Diana Jacobson](#):

On 11/13/2021 the ASU IRB reviewed the following protocol:

Type of Review:	Modification / Update
Title:	Incorporating Adverse Childhood Experience Screening into Pediatric Primary Care
Investigator:	Diana Jacobson
IRB ID:	STUDY00014193
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	None

The IRB approved the modification.

When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

REMINDER - All in-person interactions with human subjects require the completion of the ASU Daily Health Check by the ASU members prior to the interaction and the use of face coverings by researchers, research teams and research participants during the interaction. These requirements will minimize risk, protect health and support a safe research environment. These requirements apply both on- and off-campus.

The above change is effective as of July 29th 2021 until further notice and replaces all previously published guidance. Thank you for your continued commitment to ensuring a healthy and productive ASU community.

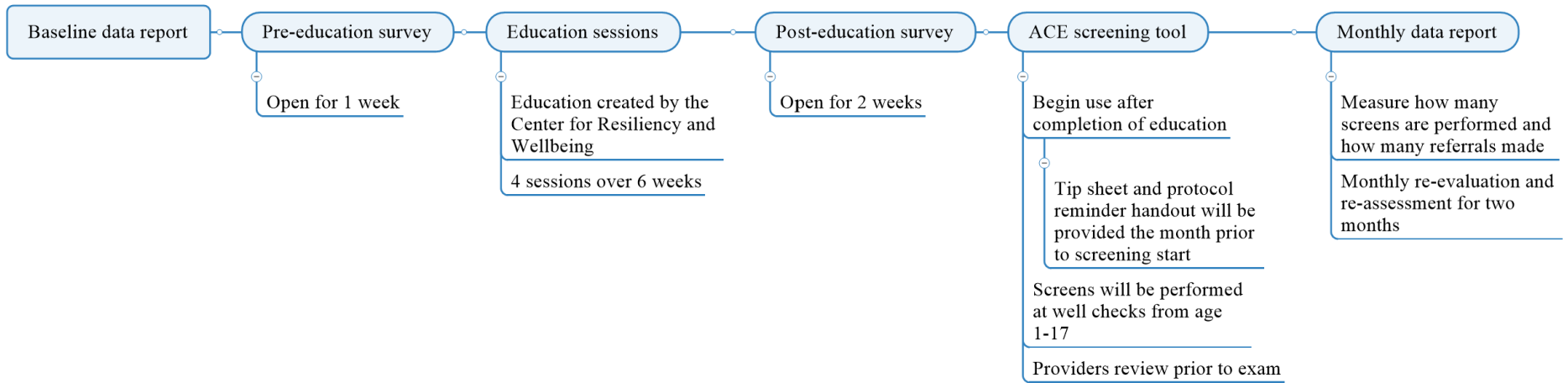
Sincerely,

IRB Administrator

cc: Charlotte Chaisson

Appendix D

Timeline



Appendix E

Surveys

Survey E1

Pre-Education Survey

Pre-Education ACEs Screening Survey

1. *I am familiar with the original Adverse Childhood Experience (ACE) study by Dr. Vincent Felitti and Dr. Robert Anda.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

2. *I believe that exposure to ACEs and childhood trauma can result in chronic illness such as heart disease, diabetes, and mental illness.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

3. *I believe my patient population is at high risk for experiencing ACEs.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

4. *I believe that it is important to screen for ACEs in pediatric patients.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

5. *I believe that I can make a difference in my patient's life by screening for ACEs.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

6. *I have time to talk about ACEs with patients during their well check.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

7. *I am confident in my ability to talk to patients/families about ACEs.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

8. *I am familiar with the physical and emotional signs/symptoms a patient might present with when they have been exposed to ACEs.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

9. *I know how to manage a patient with a high ACE score.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

10. *I believe that parents will be receptive to ACEs screening.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

Survey E2*Post-Education Survey*Post-Education ACEs Screening Survey

11. *I am familiar with the original Adverse Childhood Experience (ACE) study by Dr. Vincent Felitti and Dr. Robert Anda.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

12. *I believe that exposure to ACEs and childhood trauma can result in chronic illness such as heart disease, diabetes, and mental illness.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

13. *I believe my patient population is at high risk for experiencing ACEs.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

14. *I believe that it is important to screen for ACEs in pediatric patients.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

15. *I believe that I can make a difference in my patient's life by screening for ACEs.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

16. *I have time to talk about ACEs with patients during their well check.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

17. *I am confident in my ability to talk to patients and families about ACEs.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

18. *I am familiar with the physical and emotional signs and symptoms a patient might present with when they have been exposed to ACEs.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

19. *I know how to manage a patient with a high ACE score.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

20. *I believe that parents will be receptive to ACEs screening.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

21. *The ACEs education sessions improved my knowledge of ACEs.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

22. *I feel confident in how to use the ACEs screening tool.*

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

23. *Which sessions did you attend or view the recording of? Mark all that apply.*

(1) Session 1: Overview of Trauma

(2) Session 2: Physiology of Trauma

(3) Session 3: Overview of Trauma-Informed Care

(4) Session 4: Referrals

24. *In what ways could the education sessions be improved?*

25. *Which components of the education sessions were most beneficial to you?*

Appendix F

Tip Sheet and Protocol

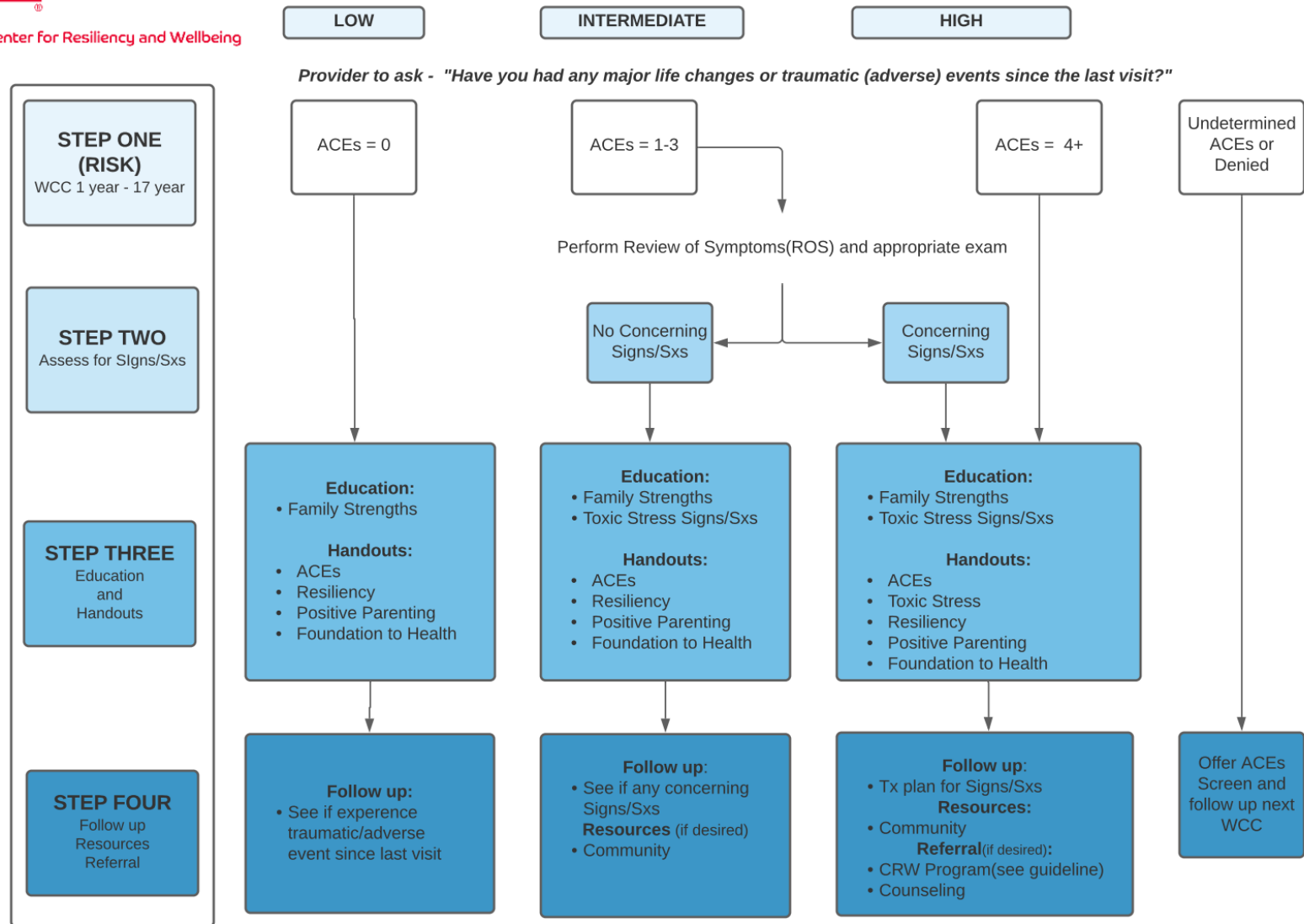
MVP Kids Care

ACEs Screening and Referral Tip Sheet

- All patients/parents of patients ages 1-17 will fill out an ACEs screening tool at annual well-checks
 - Parents will fill out the screen for the patient from age 1-12 years
 - Patients ages 13-17 will both fill out their own form
- The patients will write their total score on the screening sheet, they will not identify which questions they answered yes/no to
- ACEs scoring/intervention: (please see the protocol/flowsheet for visual guidelines on ACE scores and interventions)
 - *ACEs = 0*
 - Education, handouts, follow-up in one year
 - *ACEs = 1-3*
 - With no concerning signs/symptoms → education, handouts, follow-up, resources
 - With concerning signs/symptoms → education, handouts, follow-up, resources, & **referral to CRW** (if appropriate)
 - *ACEs = 4+*
 - Education, handouts, follow-up, resources, & **referral to CRW** (if appropriate)
- **Remember:** not all patients with a high score will require a referral. If patients feel they have protective factors present in their lives (access to resources and strong relationships) and are not interested in a referral, they will be re-evaluated the following year at their well-check.
- To access the CRW's "Smartsheet" with educational handouts for parents and information for providers, please create an account using this link: <https://app.smartsheet.com/sheets/XRrHfPPf7PR6H7v9QhCFVrgfPWg6H73MvV85Jhm1>
- Please email, call, or text Charlotte Chaisson with any questions or concerns:
 - cmchaiss@asu.edu
 - (203) 241-5331



ACEs Screening, Connecting, Building Resiliency

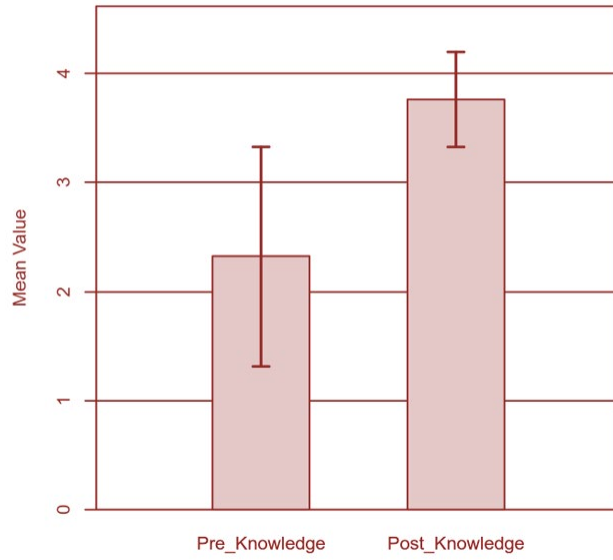


Appendix G

Graphs

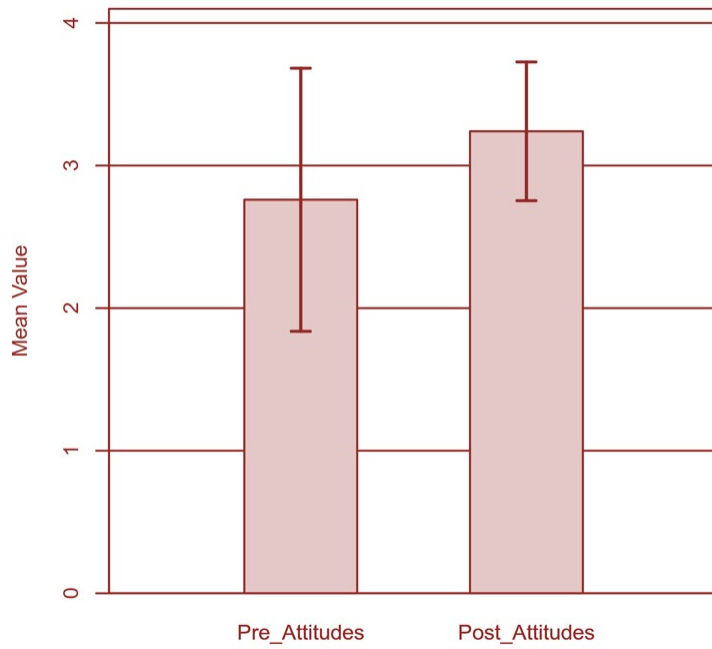
Graph G1

Pre- vs. post-education survey results: Knowledge



Graph G2

Pre- vs. post-education survey results: Attitudes



Graph G3

EHR Data Results

