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Implementation of Pediatric Adverse Childhood Experiences Screening in Primary Care

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Abstract

Problem: Over half of children worldwide have experienced abuse in the past year. In 2012, The American Academy of Pediatrics released a policy statement emphasizing the importance of primary care providers implementing Adverse Childhood Experience (ACE) screening into all well-child examinations.

Methods: This quality improvement project was a descriptive, observational pilot study in which Center for Youth-Well ACE Questionnaire (CYW-ACE-Q) was implemented into a large, metropolitan pediatric primary care clinic. A convenience sample was utilized composed of pediatric patients between the ages of 5 and 18 being seen for a well-child examination. The aim of this project was to implement ACE screening in the pediatric primary care setting between January 2021 and April 2021. A secondary aim included increasing behavioral health referrals by referring all patients with an ACE score greater than two to behavioral health.

Result: A total of 22 pediatric patients were screened for ACEs during well-child examinations. The average ACE score was 1.8. (n=22). Of those, over half had ACE scores of 2 or more. All patients who had two or more ACEs were recommended to behavioral health. The number of BH referrals increased slightly with ACE screening implementation.

Implications for Practice: This pilot study provided additional insight regarding implementation of pediatric ACE screening in primary care. While the screening rates were low (31%), significant barriers were identified that will provide insight in future PDSA cycles.

Implementation of Pediatric Adverse Childhood Experiences Screening in Primary Care

A 2016 systematic review compiled data demonstrating the number of children who experienced violence in the past year, estimating that over half of children, ages 2-17, world-wide have experienced physical, emotional, or sexual abuse (Hillis, Mercy, Amobi, & Kress, 2016). Exposure to childhood adversities such as abuse, and including exposure to substance abuse, living with a mentally ill caregiver, and experiencing incarceration of a family member are described as Adverse Childhood Experiences (ACEs) first defined by Felitti et al. (1998). A study by Merrick, Ford, Ports, and Guinn (2018) discovered approximately 61% of adults in the United States have experienced one ACE and 24% report three or more. Often childhood adversity manifests as maladaptive coping strategies in both adults and children, negatively impacting physical health (Felitti et al., 1998; Schickedanz, Escarce, Halfon, Sastry, & Chung, 2019; Shonkoff et al., 2012; Wing, Gjelsvik, Nocera, & McQuaid, 2015).

Prior to the investigation by Felitti et al. (1998) no research existed exploring the impact of childhood stress on a patient's future health. Since, research shows chronic stress creates a physiological response that is toxic to an individual's body by creating epigenetic alterations of one's DNA disposition (Bucci, Marques, Oh, & Harris, 2016; Shonkoff et al., 2012). Toxic stress is known to cause the over or under production of stress hormones, catecholamines, and inflammatory markers (Bucci et al., 2016; Shonkoff et al., 2012). This often creates lasting deviations in major anatomical structures causing complications in the cardiovascular, nervous, respiratory, immune, and endocrine systems (Bucci et al., 2016). Recent studies suggest that biological responses

often manifest in precarious behaviors such as alcohol consumption, tobacco usage, and participation in risky sexual activities (Campbell, Walker, & Egede, 2016). Without appropriate intervention, natural physiological and behavioral responses to chronic stress leads to detrimental health outcomes in adulthood including chronic illness (Bucci et al., 2016; Campbell et al., 2016; Felitti et al., 1998; Wing et al., 2015).

In 2012, the American Academy of Pediatrics (AAP) released a policy statement emphasizing the critical opportunity that primary care providers (PCP) possess in addressing childhood adversity (Garner et al., 2012). Screening for ACEs identifies risks and provides an opportunity for children to participate in primary and secondary preventions to build resiliency and decrease long-term consequences of ACEs (Dube & Rishi, 2017; Garner et al., 2012; Tink, Tink, Turin, & Kelly, 2017). While recommendations included incorporating regular screening of ACEs into scheduled visits, this has yet to become standard practice (Garner et al., 2012; Kerker et al., 2016).

The purpose of this project was to screen patients in pediatric primary care using the Center for Youth Wellness ACE Questionnaire (CYW-ACE-Q) and identify patients with an ACE score greater than two prompting a referral to behavioral health. The aim of this project was to implement ACE screening in the pediatric primary care setting between January 2021 and April 2021. A secondary aim included increasing behavioral health referrals by referring all patients with an ACE score greater than two to behavioral health. Outcome measures encompassed the number of ACE screenings administered, ACE scores, and the number of behavioral health referrals. A study question was formulated to guide the literature review: What is the effect of the implementation of the ACE screening tool in pediatric primary care?

Literature Review

A comprehensive and systematic literature search was conducted to identify the current literature regarding the implementation of ACE screening in pediatric primary care. A search was performed for English language articles using Summon, CINAHL, ERIC, Medline, APA PsycInfo, and PubMed. Initially, key words included *adverse childhood experiences, ace score, and pediatrics* which produced 2,345 results. The search was further defined by utilizing Medical Subject Headings selected for *adverse childhood experiences, ace score, ace scoring, referral, chronic disease, pediatrics, and primary care,* and limited to peer reviewed, journal articles from January 2015 through October 2020 with the exception of one seminal reference. The search produced 115 articles with duplicates removed. Articles were reviewed to ensure accuracy regarding inclusion and exclusion criteria with 12 articles selected for final inclusion.

Collectively, research findings suggest that childhood adversities create steep health implications leading to chronic disease. Research consistently revealed the lack of provider knowledge regarding ACE screening resulting in minimal screening in pediatric primary care facilities. However, numerous studies examined parents and patients' perception of ACE screening showing willingness and acceptance.

Felitti et al. (1998) completed the first cross-sectional survey to determine the correlation between childhood adversity and presence of health risk factors and chronic disease in adulthood. In the seminal study, results showed a positive correlation between increased number of ACEs and the presence of health risk factors and chronic illness in adults. For example, an increased rate of diabetes, emphysema, skeletal fractures, and hepatitis was observed in participants exposed to four or more categories of childhood

adversity. Furthermore, it was determined that a person exposed to any one ACE category was 80% more likely to report a secondary category and 54.5% more likely to report two additional categories (Felitti et al., 1998).

Specifically in children, a cross-sectional study by Wing et al. (2015) investigated the link between increased ACE scores and asthma. Guardians of 92,427 children ages 0-17 were interviewed via telephone survey to identify the association between ACEs and asthma status. Results showed that as ACE scores increased, the likelihood of an asthma diagnoses increased concurrently. For example, a child with an ACE score of one was 1.58 times (28%) more likely to have a history of asthma than a child with no exposure to childhood adversities (Wing et al., 2015).

More recently, investigators sought to determine the systematic and generational impact of childhood adversity. Quizhpi et al. (2019) designed a cross-sectional study to identify positive ACE scores in pediatric primary care patients and their caretakers. Dependent on the severity of the family's ACE score, referrals were provided for behavioral health programs. For instance, patients with an ACE score of 2 or greater were provided with educational materials and referral to local preventative programs. Later, when parents were provided with a survey to disclose their perceptions regarding ACE screening, 82% of the 51 parents surveyed revealed that having ACEs themselves caused challenges in parenting. Research has identified a cycle of trauma and health disparities that suggested that addressing ACEs is significant in preventing future generations from experiencing childhood adversity (Quizhpi et al., 2019).

Similarly, Conn et al. (2018) completed a case-control study in which parents were interviewed to gain their perspective regarding ACEs screening. Only 15 parents

were interviewed, however they reported personal experiences of childhood adversity and stated a strong desire to intervene with their children to prevent further cyclic exposures (Conn et al., 2018).

Understanding the generational impact of childhood adversity, Schickedanz et al. (2019) completed a secondary analysis on increased out-of-pocket (OOP) medical cost associated with ACE scores. The retrospective, cross-sectional study analyzed data regarding the nine ACE categories in 7,223 participants. Outcomes showed increased OOP medical costs for families with greater ACE scores creating further household burdens. Specifically, a family reporting one to two ACE scores expected OOP medical cost to be 1.18-fold higher, while families reporting three or more ACE scores expected a 1.30-fold higher OOP cost (Schickedanz et al., 2019).

While research discussing the correlation between childhood adversities and health consequences began with Felitti's study in 1998, ACE screening has yet to become standard practice largely due to two barriers: lack of provider education and perceived barriers to screening (Bryant & VanGraafeiland, 2020; Kerker et al., 2016; Tink et al., 2017). Kerker et al. (2016) investigated pediatricians' frequency and familiarity of ACE screening in conjunction with their associated education, attitudes, and beliefs. The cross-sectional survey of 302 pediatricians, showed only 4% of pediatricians addressed all seven ACE categories in a primary care visit. While almost all pediatricians agreed that childhood adversities negatively impact children, only one-third agreed with the scientific evidence that the physiological response results in DNA alterations. Additionally, providers found the allotted time for each visit to create a substantial barrier to screening (Kerker et al., 2016).

A similar case-control study was completed by Tink et al. (2017) which surveyed 112 first- and second-year family medicine residents' knowledge, attitudes, and belief regarding the importance of screening for ACEs. Results showed only 45.5% of residents had received formal education regarding the usage of the ACE screening with only five reporting education occurring within the residency program. Additionally, only 1.8% of the residents felt comfortable administering the ACE screening to patients on their initial visit. While results were limited by a small sample at a single institution, this study contributes to the need to reform provider education.

A study completed by Bryant and VanGraafeiland (2020) builds on this research with a small scale, cross-sectional survey to investigate the benefits of provider education. Fifty-nine PCPs were given a pre-test prior to attending an educational seminar utilizing the AAP trauma toolkit. Over the next 12 weeks, providers were instructed to incorporate the ACE screening into all well-child examinations. Final results revealed that provider education increased screening implementation and helped to maintain usage of ACE screening. In post-tests, providers reported increased comfort in their ability to adequately screen patients while additionally finding the screening to be valuable to the overall well-child examination. Most significantly, 52 of the PCPs stated they would continue to incorporate the ACE screening into well-child examinations, but similar to the study completed by Kerker et al. (2016) hesitation was expressed due to the time constraint of each office visit (Bryant & VanGraafeiland, 2020).

While many providers feel inadequately prepared and uncomfortable administering ACE screenings, numerous studies confirm the acceptability among patients and parents. In a cross-sectional survey, Goldstein, Athale, Sciolla, and Catz

(2017) investigated patients' willingness to discuss past traumatic experiences and their confidence in PCPs' ability provide assistance. Overall, results showed patients feel comfortable sharing their past experiences. Additionally, they felt confident in their PCP's ability to administer the screening and facilitate connections to additional resources to promote healing and long-term health (Goldstein et al., 2017).

Conn et al. (2018) contributed further data by completing a case-control study in which parents were interviewed regarding their perceptions of ACE screening in primary care. From the 15 interviews completed, qualitative results suggested acceptance and appreciation of the screening. Parents reported this as an opportunity to address familial needs, receive parenting guidance, obtain referrals for additional support, and increase the likelihood of breaking the generational impact of ACEs (Conn et al., 2018).

Koita et al. (2018) and colleagues focused on developing an ACE screening tool that was acceptable and beneficial to parents and children in the primary care setting. While three different forms of screening tools were assessed—paper, in person interview, and an electronic version—all versions were found to be useful and acceptable by families. The overwhelming theme, regardless of the screening tool, was gratitude as parents felt PCPs were invested in assisting them in overcoming past hardships (Koita et al., 2018).

Screening for ACEs identifies risks and provides an opportunity for interventions to occur in primary care in hopes of decreasing long term complications and improving lifelong health (Dube & Rishi, 2017; Tink et al., 2017). Dube and Rishi (2017) completed a cross-sectional survey of 12,032 adults with a history of childhood adversities to determine their current number of mentally unhealthy days (MUDS) and physically

unhealthy days (PUDS). Overall, patients reported less MUDS and PUDS with interventions including social support where they are able to share their experiences. Recommended interventions include social support group, therapy, and other therapeutic interventions (Dube & Rishi, 2017). These results suggest that primary prevention measures are needed to create health promotion strategies that decrease residual behavioral caused by exposure to childhood adversity.

Most research completed regarding ACE screening is retrospective and self-reported with a cross-sectional design. Self-reported data is dependent on the participant accurately recalling past events and truthfully answering the survey questions. Due to the sensitivity of topics presented in the ACE screening, under reporting may occur to produce socially desirable results. With cross-sectional designed studies, results and associations do not imply causality.

PDSA and Kotter's Eight Steps for Leading Change was the theorical framework chosen to guide this project. The PDSA cycle, often utilized in healthcare setting, will provide a rapid-cycle improvement strategy allowing for continuous improvement and adjustments (Melnyk & Fineout-Overholt, 2019). Kotter's Eight Steps for Leading Change will guide the implementation of the PDSA cycle, as creating a change in culture will be required to facilitate the desired institutional change (International, 2018).

Methods

Design

This quality improvement project was a descriptive, observational pilot study. A retrospective chart review occurred to collect quantitative data regarding the number of behavioral health referrals from October 2020 through December 2020. Prospective data

regarding the number of ACE screenings, ACE scores, and number behavioral health referrals were collected in May 2021 after implementing the CYW-ACE-Q.

Setting

This project occurred in a physician owned, pediatric primary care clinic with approximately 3500 patients, and 1000 employees in the Saint Louis metropolitan area. Patients seen in this clinic are primarily North St. Louis County residents with approximately 50% covered by Medicaid.

Sample

A convenience sample was composed of pediatric patients between the ages of 5 and 18 being seen for a well-child visit. Patients outside of the identified age range or seeking acute medical care were excluded.

Procedure

The CYW-ACE-Q Child was verbally provided to patients ages 5 to 12 being seen for a well-child examination. It included 17 questions to be answered by the legal adult present with the patient. The 19 question CYW-ACE-Q Teen Self-Report was verbally provided to patients between the ages of 13 and 18 in a confidential conversation. With both screenings, answers were recorded in the appropriate template located within the EMR.

Data Collection/Analysis

A retrospective record review containing quantitative, descriptive data regarding the number of behavioral health referrals from October 1, 2020 through December 31, 2020 generated after primary care pediatric visits was collected initially.

On January 1, 2021, the CYW-ACE-Q was uploaded in the Electronic Medical Record (EMR) utilized by the healthcare facility. All screenings were documented directly into the EMR therefore becoming part of the patient's medical record. Data was analyzed in May 2021 by primary investigator. Data was recorded into SPSS using a deidentification process that applied a unique alphanumeric identifier. The unique ten-digit identifier was created by utilizing the patient's first and last initial followed by their 8-digit date of birth. This list was stored within the primary investigator's desktop in a password protected filed.

Demographic data collected included age, gender, race, zip code and language spoken. Specific to this investigation, ACE scores for section question were documented as "yes" = 1 or "no" = 0. If yes, the number of positive ACE categories was numerically documented. Additionally, data was collected regarding behavioral health referral status. "New referral" = 1, "Existing referral" = 2, "Recommended referral, but refused" = 3, and "Not necessary" = 4. Descriptive and frequency statistics were employed via Statistical Package for the Social Sciences.

Approval Process

Formal, written approval was attained from the participating clinic's Chief Medical Officer on November 4, 2020. Approval was obtained from the University of Missouri- St. Louis Institutional Review Board on February 2, 2020.

Results

Demographics

Out of 70 patients between the ages of five and eighteen who were seen in the clinic for well-child examination during the project time frame, 22 were screened for ACEs using the CYW-ACE Questionnaire (31%). There were 12 males (54.5%) and 10 females (45.5%). Thirteen (59.1%) participants were African American while only 6 (16.7%) identified as White. All patients spoke English (n= 22, 100%). While the patients represent a variety of zip codes, 63031 and 63135 made up almost half of the sample (n= 6, 27%; n= 4, 18%). Out of the 22 completed screenings, six (27%) children were screened while 16 (72%) adolescents were screened. Overall, the patients were on average 14.5 years of age (SD: 3.1) (Table 1).

During the implementation phase, the 22 ACE screenings revealed an average ACE score of 1.8 (SD: 1.7). Only six patients reported no ACE exposures (27%), 14 reported one to three adversities (64%). All patients who had two or more ACEs were at least recommended to behavioral health (n= 13, 59%) (Table 2). Six patients (27.3%) received a new referral. Two participants (9.1%) already had a behavioral health referral placed. Seven participants (31.8%) were recommended for a behavioral health referral but declined.

Prior to the implementation of ACE screening, between October 2020 and December 2020, the provider saw a total of 74 patients between the ages of 5 and 18 for well child examinations. A total of five behavioral health referrals were made and six were recommended to the patient but declined. Since the primary care clinic had never screened for ACEs prior to this pilot study, no data is available regarding the reasoning for referral.

Discussion

In this quality improvement project, ACE screening was successfully implemented into an organization that had previously never completed this screening. Furthermore, it fulfilled the aim to identify patients with an ACE score greater than two prompting a behavioral health referral. The findings demonstrate the need of ACE screening in pediatric primary care, while simultaneously identifying significant barriers providers face when implementing the screening process.

Consistent with literature, it is evident that children are facing adversity as over half the patients reported two or more ACEs. By providing this screening, interventions to mitigate the long-term health consequences of ACEs were established. However, of note, seven patients declined behavioral health services when offered (31.8%). Providing familial education regarding ACEs and determinantal health outcomes of childhood adversity may encourage families to accept the referral.

When comparing the results to the retrospective data prior to implementation of the ACE screening, a slight increase in behavioral health referrals was noted. This may be as a result of the provider giving greater consideration regarding the role of long-term trauma during a well-child examination. It is important to note that the pediatrician providing the screening had prior education and experience regarding ACEs. In order to implement this system wide, it would be necessary to provide education to the providers regarding childhood adversity and screening techniques.

Despite the encouraging findings of the quality improvement project, it is evident that improvement is necessary with the low screening rate (31%). Similar to previous studies, time constraints were recognized as a barrier to screening (Bryant & VanGraafeiland, 2020; Kerker et al., 2016). With the questionnaire being between 17 to

19 questions in length, it takes the provider a significant amount of time to read each question. Further, these questions often produce an emotional response that requires conversation.

When preliminary results were shared with other pediatricians within the organization, they felt the ACE screening was repetitive of the current Adolescent Questionnaire already utilized within the agency. A common complaint of patients includes the number of forms required to fill out with each visit. The group as whole recommended using the current Adolescent Questionnaire to formulate an "estimated ACE" score in a future PDSA cycle. Since many of the questions are similar in nature, the algorithm would offer the provider a realistic estimation of the patient's ACE score, flagging those with higher scores. The provider would then have the option of providing the complete CYW-ACE-Q as further investigation. Ideally, the questions that are the same between the questionnaires would populate into the ACE screening tool allowing the provider to only ask a few additional questions.

Future PDSA cycle should also investigate resources within the community along with the effectiveness of the behavioral health referrals. While this study did not investigate the availability of resources, literature shows this can often be barrier to screening. While identification of childhood adversity is key, ensuring appropriate interventions occur would be vital for long term health outcomes.

Conclusion

Consensus across literature points toward the need for increased ACE screening and scoring in pediatrics, as it leads to the identification of risks at an early age and creates an opportunity to address behaviors that could minimize long term health

consequences. As such, this pilot study provides additional insight regarding identification and interventions while creating the foundation for improvement and additional PDSA cycles.

As a doctorate prepared nurse (DNP), implementation of evidenced-based recommendations such as ACE screening are possible. Continual collaboration with the interdisciplinary team responsible for ACE screening will be essential in developing future PDSA cycles. DNP nurses will be a vital component of the future development of the screening process. Similarly, DNP nurse could be key in creating collaborative tools of available resources, education to families, along with follow up and transition assistance for families/patients to the referral sources. The ability to secure resources and trust the transition could be key to initial success and future view of utilizing resources.

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Appendix A

Table 1. *Demographic Characteristics of Patients Screened*

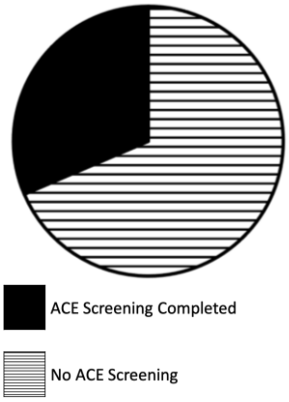
	Child (age 5-12) n= 6		Adolescent (age 13-18) n= 16	
	n	%	n	%
Gender				
Male	5	83.3%	7	43.8%
Female	1	16.7%	9	56.3%
Race				
African American	5	83.3%	8	50%
White	1	16.7%	5	31.3%
Mixed Race	0		1	6.3%
Unknown	0		2	12.5%
Language				
English	6	100%	16	100%

Note. N= 22

Appendix B

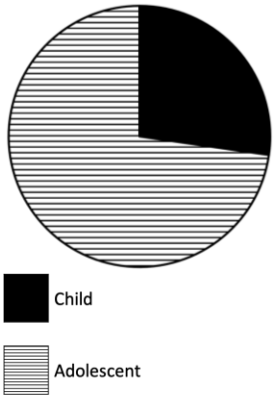
Figure 1

Total Screened



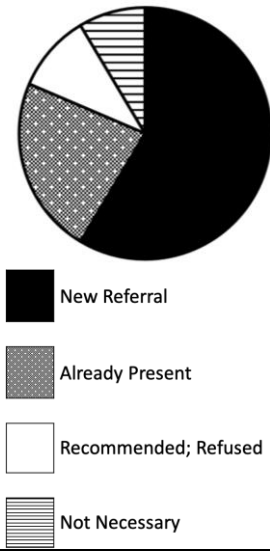
Note. N= 70 patients between the ages of 5-18 were seen between January 15- April 15 for well-child examinations. n= 22 patients were screened for ACEs (31%)

Adolescent vs. Child Screenings



Note. N= 22 screenings (n= 6 child screenings, n= 16 adolescent screenings)

Behavioral Health Referrals From ACE Screenings



Note. Out of the 22 patients screened six new referrals were made. Two patients already had a behavioral health referral in place while seven were recommended to behavioral health but refused. Seven patient's scores did not require intervention.