Screening of Adverse Childhood Experiences Using Adverse Childhood Experiences - Questionnaire (ACEs - Q) Among Children Ages 0-12 in a Pediatric Primary Care Setting

Olubunmi Adetule, MSN, APN, PMHNP-BC

Rutgers, School of Nursing

DNP Project Chair: Kyeongra Yang, Ph.D., MPH, RN, CNE

DNP Team Member: Fred Andes, DSW, MSW, MPA, LCSW, LCADC

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Abstract

Effects of adverse childhood experiences (ACEs) present a major challenge to the overall health of children even after childhood. In this regard, the identification of ACEs is seen as a critical aspect in any public health setting. About 50% of children globally experience some form of adversities. Early screening and assessment allow for early diagnosis as well as reduce negative health implications associated with such health effects. This DNP project aims to introduce the Center for Youth Wellness Adverse Childhood Experiences-Questionnaire (CYW ACE-Q), a standardized screening tool to promote early detection of Adverse Childhood Experiences (ACEs) in children ages 0-12, and evaluate providers' readiness to use the screening tool during wellness visits at pediatric primary care setting. Various articles from nursing and other scholarly journals database revealed that exposure to adversities such as abuse and physical neglect during childhood and adolescents tender age results in disruptive and negative health outcomes in adulthood. This project successfully implemented Adverse Childhood Experiences-Questionnaire (ACEs-Q) to assess the metrics understudy to children between the ages of 0-12 in a pediatric office in northern New Jersey. Descriptive statistics were used to describe and summarize the data. The Friedman test (the non-parametric alternative to repeated measures ANOVA) was employed. The project findings indicated that the clinicians have demonstrated awareness, interest and willingness to continue use of CYW ACEs-Q routinely in the practice evident by significant change in the weekly usage.

Keywords: adverse childhood experiences, pediatric primary care, trauma, perception, effects. knowledge translation

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Introduction

Adverse childhood experiences (ACEs) such as abuse and physical neglect during child and adolescent development stages result in disruptive behavior and impaired physical health outcomes (Bethell et al., 2017). In New Jersey children, more than 40% (less than 18 years) of ACEs exposure and more than 18% of the child had experienced at least two ACEs (NJ Funders ACES Collaborative [NJACES], 2019). According to Kalmakis and Chandle (2015), ACE is "Childhood events, varying in severity and often chronic, occurring in a child's family or social environment that cause harm or distress, thereby disrupting the child's physical or psychological health and development" (Kalmakis & Chandle, 2015, p. 148). This definition has previously been improved by proposing that ACE is the exposure during childhood or adolescence to environmental circumstances that are likely to require significant psychological, social, or neurobiological adaptation by an average child and that represent a deviation from the expectable environment (McLaughlin, 2016, p. 363). Despite the diverse definition by various authors to the current topic, it is evident that ACE is associated with affecting overall mental, physical, as well as the emotional health of the individuals involved.

There exists an extensive body of literature that links exposure to trauma and psychiatric disorders (Chesney et al., 2014). Exposure to traumatic events has also been found to be a major cause of mental disorders among children and adolescents (Geddes, Dziurawiec, & Lee, 2013). A child's negative behaviors, such as acting out are collectively described and categorized as "children with behavioral problems." They are often diagnosed with attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), disruptive mood

dysregulation disorder (DMDD), conduct disorders, and adjustment disorders. Proper screening of ACE would help avoid any misdiagnosis, identify high-risk patients for appropriate care, and prevent the occurrence of more chronic and lethal health effects. In addition, appropriate screening procedures would help primary care providers (PCPs) correctly identify causes of the intense behavioral problems seen in children and adolescents when they are brought to primary care.

Background and Significance

Family background is an important source of ACEs. Previous research has also addressed a wider adversities range of sources including the economic situations and challenges, peer relationships, community stressors, negative family relationships, negative school experiences, separation from parents, and discrimination (Baglivio, Wolff, Epps, & Nelson, 2017).

Adolescence is the rapid growth and development stage that is characterized by rapid growth in cognitive, physiological emotional and social changes (Catani & Sossalla, 2015). For example, the rapid development of the brain occurs below the ages of 6. The presence of ACE during this stage can have profound effects on brain development. (Steele et al., 2016). Taking into consideration the imperativeness of this stage, ACE can impede these development cycles. Besides, the accumulation of ACE can culminate in higher risks of psychotropic medication in adolescents. Exposure of children to stressful events, such as their first day at school, abuse, the experience of violence, or substance use triggers their stress response system (Purewal et al., 2016). This has the potential of culminating in several other challenges, such as poorer health outcomes and adverse cognitive development.

Experiences that children go through during their childhood determine the nature and magnitude of care, so ACEs have significant effects on the quality of care in later years.

According to a study done by Bethell et al. (2017), ACEs are related to short and long term negative physical and mental health such as neurological functioning. The stressors that are encountered throughout an individual's life could be experienced in diverse ways. While ACE may affect the long-term health implications of a child, their developmental aspects could lead to more health complications in the long run. The results imply that ACE can affect the entire population in the long run through increasing medical care costs and overburdening the health care system.

In the U.S., where 30% of the population is reported to suffer from at least one form of mental illness, misdiagnosis presents a similar strain to mental health services (Vermani et al., 2011). Studies indicate that as many as 12 million diagnostic errors annually burden the healthcare system with an extra $100-500 billion (Singh, Meyer, & Thomas, 2014). Proper screening of patients is a vital step in the prescription of the appropriate treatment. American Pediatric Association (AAP, 2014) strongly recommended PCP to implement ACE screening tools and identify high-risk patients for appropriate care.

Need Assessment

Global

More than 50% of the children experience some form of adversities (Perez et al., 2018). In another study, 50% of children ages 10-11 in a primary school in the Netherlands have recorded at least one ACEs (Vink, Pal, Eekhout, & Pannebakker, 2016). Insights on the predominance of aggressive behavior at home in Australia are upsetting. As indicated by the yearly report on wrongdoing discharged by the Australian Bureau of Statistics (2017), there were 452 crimes exploited people in Australia in 2016. Police records demonstrate that 176 (39%) of these population was identified with abusive behavior at home (Australian Bureau of Statistics,

2017). Ladies were the most exploited people as they represented in any event 65% of crime unfortunate casualties that were identified with family and aggressive behavior at home (Parker, 2017). For instance, females in the Northern Territory were multiple times bound to be casualties of a household ambush than guys (Parker, 2017). These numbers have driven some to compare family savagery to brutality against ladies. Abusive behavior at home has been named to epitomize the power contrasts that exist among ladies and men even in the advanced and created social orders. Regardless, ladies have been built up to end the status of primary casualties of the residential attack, assault, and even murder. Another similar study conducted in the Netherlands by Vink et al. (2016) found out that almost half the children aged between 10 to 11 years old in regular primary school experienced one or more adverse experiences (Vink et al., 2016). In European studies, about 14% to over 70% of all children were believed to be exposed to at least one traumatic event (Alisic, 2012).

National

Almost half of all children national-wide (35%) had at least one ACE exposure (Child and Adolescent Health Measurement Initiative, 2017). The Economic Burden in the U.S. for Child Abuse is estimated cost of morbidity due to nonfatal child maltreatment: $760,000 (2015 USD) while the annual U.S. population economic burden is approximately $428 billion to $2.0 trillion, 2015 USD (Peterson, Florence & Kleven, 2018). Research conducted by Reichman, Corman, Noonan, and Jimenez (2018) indicated that having a disabling health condition, such as intellectual disability, was associated with 83% more of odds of experiencing more than one ACE. Besides, the study indicated that the challenges attained by children during growth could culminate to even more lethal challenges in the future during adulthood (Reichman et al., 2018).

State

More than 40% (Estimated over 782,000) of New Jersey children have experienced at least one ACE and 18% had multiple ACEs exposure (NJACES, 2019).

Local

Despite ACE's prevalence and lifelong negative health outcomes, the project site has no ACE screening tool in place nor is aware of the concept as disclosed by the site's providers.

SWOT Analysis

According to Orr (2013), Strength, Weakness, Opportunity, and Threat (SWOT) analysis is described as a strategic planning technique to assess and initiate meaningful change to improve the program. The goal of this QI project to its strength, weakness, opportunities, and threat was examined using SWOT analysis (see Appendix A).

Strengths

The project site has a wide range of patients that will benefit from the implementation of ACEs. The strengths include culturally sensitive care to patients and family, over 3,600 patients annually, availability of space for privacy, willingness, appropriate use of the international classification of diseases (ICD code) to cover the cost of care, and openness to implementation of ACEs-Q and referral to appropriate care.

Weaknesses

The identified weaknesses in the project site include the small number of staff (two pediatricians, 3 family nurse practitioners, 3 medical assistants, and an office manager) allotted time constraints to care for each patient and challenges post by additional workload from the ACE-Q implementation. When the practice is short-staffed, it will affect the implementation

process. The providers see 12 to 25 patients per day with an average of 4-5 patients require ACE assessment per provider's disclosure.

Opportunities

An increase in knowledge and awareness of ACE screening in a primary care setting will support the early detection of mental conditions. There is an opportunity to train staff on the initiation of ACEs-Q screening. Also, the opportunity to improve outcomes through appropriate treatment.

Threats

There is a potential threat to the patient's privacy and local practice competitors. It also includes spyware, malware, and disgruntled internal employee(s).

Problem Statement

According to the APA Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (2013), trauma is classified as hyperactivity and attention problems and not be allocated specific attention as an independent behavioral disorder. Thus, many health care providers have continuously diagnosed children with ADHD without regarding their past traumatic experiences as a cause for their health challenges. The disregard of trauma has resulted in numerous misdiagnoses since different behavioral disorders have similar causes and symptoms. Traumatic experiences that take place at an early age of a child usually affect the child to adulthood and thus lack of proper interventions to counter the effects of the trauma are likely to distort the life of the individual. Thus, the exploration of trauma and its relation to behavioral disorders is paramount. The neurobiological and epidemiologic findings show cumulative, cascading, and multidimensional effects of trauma and stress associated with ACEs (Bethell et al., 2017). Children are often misdiagnosed due to clinicians focusing on disruptive and aggressive behavior

of the children while neglecting to find reasons children are struggling with negative behaviors. Thus, the current DNP Project will seek to determine how such factors affect the chances of a child being diagnosed with behavioral disorders and trauma. This has a tremendous impact on the classification of ADHD/behavioral problems in the practice.

The cost of treatment and control of ADHD will also be a major concern for the project. Various studies have stated the annual costs for people with ADHD to be between $143 billion to $266 billion for both children and adults. The economic burden for children in the U.S. alone is over $38 billion. Behavioral disorders not only affect the children or adults financially but also psychologically, socially, and physically. However, due to lack of enough data, the impact of trauma especially on the children remains an understudied field.

The DNP project will answer the following clinical question:

How does screening for adverse childhood experiences exposure impact early detection of trauma among children ages 0-12 in a pediatric primary care setting?

Aim and Objectives

The overarching aim of this project is to introduce the Center for Youth Wellness Adverse Childhood Experiences-Questionnaire (CYW ACE-Q), a standardized screening tool to promote early detection of Adverse Childhood Experiences (ACEs) in children ages 0-12, and evaluate providers' readiness to use the screening tool during wellness visits at pediatric primary care settings

To introduce the screening tool into practice, the project aims:

(1) To educate staff and providers (via a one-hour educational training) about ACEs-Q including administration of the screening tool, result interpretation, referral process, and follow-up.

(2) To check the usages of and attitude and perceptions towards CYW ACEs-Q among pediatric primary care providers over the 8-week period.

Research Question

How does a one-hour educational training about CYW ACEs-Q impact providers' usage and readiness to use this screening tool into practice in a pediatric primary care setting over eight (8) weeks?

Review of Literature

Search Strategy

This section focuses on the related literature in the field of effects of ACEs on the affected Population. To achieve this objective, this section analyzes and synthesis systematic literature reviews in the relevant fields to come up with a rational conclusion on the topic.

A literature search included PubMed, CINAHL, ClinicalKey for Nursing, and Google Scholar database resulting in 47,050 studies. Limiters include scholarly/peer-reviewed, full text, English language, publication date from 2014-2019, resulted in 15,551 articles. Keywords *screening for adverse childhood experiences* AND *pediatric primary care* AND effects, *trauma* AND *pediatrician perception regarding adverse childhood experiences.* A total of 32 research articles were obtained after reviewed some of the abstract (see Appendix B for Prisma Flow Diagram).

The themes addressed in the literature include socio-demographic risk factors of ACEs, adverse effects of ACEs on health outcomes, the importance of early intervention on ACEs, and proper assessments of ACEs. The evidence of the clinical questions is mostly leveled II to III of good to high quality were appraised and synthesized (see Appendix C for Summary Table of Evidence).

Socio-Demographic Risk Factors of ACEs

Adverse childhood experiences also contribute to the deterioration in the quality of life among individuals. This proposition is corroborated by Halfon, Larson, Son, Lu, & Bethell (2017) in their study of income inequalities and the differential effects of adverse childhood experiences in the US. They submitted that ACE can affect health and development across the life course (Halfon et al., 2017). Despite a general understanding that adversity is associated with lower incomes, ACE has the potentiality of affecting an individual's health in the long run. Their study collected data from the 2012 national survey of children's health to examine the prevalence of ACEs among US children. The study applied bivariate and multivariate logistics regression to examine the association between the number of ACE's and the health of the children based on four income groups. Their results pointed out that there was a steep income gradient for the proportion of children who experienced ACE. The linear gradient across the income groups was less pronounced for every specific ACE, with several of them showing high reported prevalence. The study, however, failed to find higher income as a protective factor against ACEs.

Zettler, Wolff, Baglivio, Craig, and Epps (2018), on the other hand, examined the association between racial and gender differences in the impacts of ACE experiences on juvenile residential placement. The study utilized a sample of 4,733 juveniles in Florida to examine the relationship between ACEs and residential placements across ethnic and gender placements. ACE increases the odds of residential placement by age 17. Besides, the study pointed out to males being more prone to ACE associated challenges in the long run. For instance, the research found out that male was at higher risks of residential placement as a result of ACE. The study also found out that those consistent predictors for residential placement across demographic

groups incorporated anger challenges, the presence of antisocial behaviors, and issues related to substance use (Zettler et al., 2018).

There are increasing numbers of studies that have focused on the adverse role played by ACE in predicting the later adverse health outcomes for adults. ACE questionnaire is used to identify clinical practice social issues that are unaddressed. Such issues can influence current morbidity, early mortality, and health risks (Felitti et al., 1998). Glowa, Olson, and Johnson (2016) conducted a study on this topic by assessing the screening tools for adverse childhood experience in a family of a medical setting. Their study specifically aimed at exploring the feasibility of implementing the ACE screening of adults during frequent family checks and visits. The applied methodology incorporated administering ACE questions at three rural clinical practice settings. The sample included 111 patients of seven clinicians. The results indicated that there was a high-risk factor for ACE in 62% of the patients. Besides, the results pointed out that clinicians were more likely to have discussed issues related to ACE with patients after the visits to the health facility. Furthermore, the results pointed out that clinicians were more likely to encounter new challenges as a result of differences in ACE outcomes among different individuals (Glowa et al., 2016).

Synthesis

ACEs have been found to have adverse effects on the lives of the individuals involved. Many researchers have researched on the relationship that exists between ACEs and the quality of life of the individuals involved and found out that ACEs adversely affect their health. Some of the facts that have been established by the researchers include the existence of a relationship between ACEs and lower-income. Low income can thus be pointed out as one of the risk factors of ACEs as children from poor backgrounds have been found to be more likely to develop ACEs.

Gender has also been identified as the second risk factor for ACEs as men have been found to more prone to ACEs as compared to women. It is worth noting that juvenile residential placement, a precursor for ACE, was found to more likely to happen to male children.

Impact of ACE on General Health

ACE can affect the social, behavioral, emotional, as well as the mental health of the individuals. According to a study done by Hunt, Slack, and Berger (2016) on 3,000 children in the U.S., ACE was positively related to externalizing and internalizing behaviors and the likelihood of individuals being diagnosed with attention deficit hyperactivity disorder during their middle childhood (Hunt et al., 2016). The study further revealed those children who were as young as nine years began to show behavioral challenges due to exposure to ACE. A similar study conducted by Kerker, Zhang, Nadeem, and Stein (2015) indicated that in young children, ACE was associated with poor mental development and health complications and social developmental challenges among the children aged three to five years. The research has indicated that the persistent occurrence of ACE in children has a greater negative effect and on externalizing as well as internalizing problem behaviors on IQ.

The study also pointed out that there were instances of multiple maltreatments with other types of dysfunctions (Levenson et al., 2015). This suggests that many of the children who were raised with ACE had higher chances of developing health complications in the long run (Davis, Barnes, Gross, Ryder, & Shlafer, 2019). This study contributes to the topic studied herein by pointing out that ACE is significantly associated with later health complications and dysfunctions as a result of poor treatment. The authors, however, failed to focus on risks that children exposed to mental trauma face during their later developmental stages. These include instances of physical abuse on children and their impact on the individuals and the entire society.

Synthesis

As has been pointed out above, ACEs affect the health of its patients, thus decreasing their quality of life. Generally speaking, ACEs affect an individual's wellbeing, which entails their social, emotional, and mental wellbeing. As a result, ACE patients tend to develop challenges in different aspects of their day-to-day lives. For instance, they may develop mental health problems, poor social skills, emotional instability, and experience challenges when it comes to attachment. As the study that was carried out by (Hunt, Slack, & Berger 2016) reveals, there is a connection between externalizing and internalizing behaviors in children and ACE. It manifests as attention deficit disorder. Poor health of the individuals who experienced ACE can thus be attributed to ACE and addressing it is one of the ways that the lives of the patients can be improved.

ACEs and Aggressive Behaviors

Past examinations have discovered that few factors improve the probability of a home or an individual being rough. As indicated by Holt, Buckley, and Whelan (2008), presentation to aggressive behavior at home increased the probability of one being a casualty of the bad habit as a grown-up. These discoveries have shown that women who were casualties of household attacks in their adolescence were one and a half times bound to be casualties of ambush from relatives than the individuals who had not experienced the bad habit in their childhood (Holt et al., 2008).

Adverse childhood experiences can contribute to aggression and violence during adults. In assessing the adverse childhood experiences in the lives of female sex offenders, Levenson, Willi, and Prescott (2015) found out that ACE contributed to aggressive behaviors among the population. Their study specifically aimed at exploring the prevalence of early trauma in a sample of female sexual offenders in the U.S. They applied adverse childhood experiences scale

in this undertaking. Their study found out that in comparison with the general population, sex offenders had more than four times the chances of having ACE and more than three times the chances of experiencing emotional neglect. Besides, their study found out that half of the sexual offenders had a history of being sexually abused during childhood. Higher ACE was associated with having younger victims.

Synthesis

One of the elements that characterize ACE is aggression. In the case of ACE patients, they tend to experience aggression in many forms. For instance, the aggression may exist between their parents or the parents directing the aggression to the children. Growing up in an aggression filled environment that can escalate into violence increases the likelihood of the children becoming aggressive and violent when they grow up. In adulthood, the children who were brought up in aggressive homes are more likely to become sexual offenders as compared to the general population, as the study carried out by (Levenson, Willi, & Prescott, 2015) concludes. Additionally, sexual offenders have been found to have been exposed to one or a combination of ACE risk factors.

ACEs and Risky Behaviors

Childhood experiences impact significantly on the mental stability and overall health of an individual. The health-threatening outcomes have been found in different instances during adult youth outcomes, such as the use of drugs, anxiety, and depression antisocial behaviors among other life-threatening health challenges (Steele et al., 2016). Among young adolescents, physical abuse has been linked to risky health behaviors, including smoking and early pregnancy.

Shanta et al. (2003) conducted a study to assess the association between ACE and the risks of illicit drugs. Their study specifically examined the relationship between illicit drug use and 10 categories of ACE, and the total number of ACE's. The sample included a retrospective cohort study of 8613 individuals who were attending a primary care clinic in California. The results pointed out that every ACE increased the likelihood of early initiation into drug use by 2-4 folds. The study specifically found out those individuals who were exposed to ACE were 50% more likely to be involved in illicit behaviors, such as drug use, during their later life (Shanta et al., 2003).

Shanta et al. (2003), on the other hand, aimed at finding the relationship between ACE and drug use during the early development stages. These studies used divergent approaches in assessing the topic at hand. Although, their results were convergent to the proposition that ACE affects the entire population negatively and during the later developmental stages of a child. These studies are imperative in contributing to the current topic by pointing out that traumatic events during the developmental aspects of a child go a long way in impacting on their health. The authors noted that ACE does not only impact on the well-being of a child during the early life stages but also during adulthood. Towards these perspectives, there is needed to lay more insight into the need to control and detect instances of ACE to eliminate associated challenges.

Adverse childhood experiences affect the health of children and bear negatively on the behaviors of individuals. Mistreatments and challenges experienced by children during the earlier developmental stages significantly affect their later development stages and overall health. According to a study with the Behavioral Risk Factor Surveillance System (BRFSS), ACE is associated with a variety of behavioral risk factors and chronic illnesses, such as adulthood (Downey et al., 2017). The results pointed out that the majority of the adults in Iowa,

approximately 58%, have experienced at least one instance of ACE during their childhood. This is dependent on the type of ACE, and its co-occurrence ranged from 76% to 97%. The study also found out that health risk behaviors, such as drinking, obesity, and smoking were significantly associated with ACE experiences (Downey et al., 2017).

Synthesis

During childhood, children are always at an absorption stage whereby they absorb all that is fed to them and then emulate it later. Generally, the wellbeing of the children is very fragile. However, something such as being subjected to physical abuse not only brings the possibility of emulation later on but also the risk of developing a coping mechanism. Children brought up in homes where they are subjected to physical abuse are likely to resort to risky behaviors as a coping mechanism. Some of these risky behaviors include drug abuse, smoking, drinking, and even early pregnancy. Such is due to the fact that the physical abuse they are subjected to leads them to develop anxiety and depression hence resorting to the coping mechanisms mentioned above. All in all, ACE, through the effects of its elements such as depression and anxiety, leads the victims to engage in risky behaviors as a coping mechanism.

ACEs and Long Term Health Outcomes

Critically, the study by Downey et al. (2017) associated ACE with certain behavioral risk factors and chronic illnesses. The results pointed out a significant and negative association between ACE and chronic illnesses during the later development stages of a child. Increased rates of depression were associated with ACE (Downy et al., 2017). Also, the results pointed out that the increased rates of chronic health outcomes, such as heart disease; stroke, and COPD were significantly associated with ACE.

Baglivio et al. (2017) assessed the association between childhood environment and health status of an individual. The study found out that the neighborhood in which a child is predisposed to affect their overall health perspectives, as well as impacting on their behaviors. While these two authors used divergent approaches in data collection, the results were uniform in pointing out to association between ACE and negative health aspects of individuals. These studies, however, failed to consider the significance level of the association between ACE and deterioration of health during adulthood. Secondly, theses research does not consider the effects of Adverse Childhood Experiences on the Traumatized Population.

ACE has been pointed out to have certain consequences on the psychosocial, neurobiological, and somatic conditions of individuals across the lifespan. According to Herzog & Schmahl (2018), ACE, such as sexual arousal, neglect, or abuse, are ubiquitous in childhood and constitute a massive stressor that have long-lasting effects on the brain of such individuals. Their study aimed to review the present and previous literature on the impact of ACE on mental, neurobiological, and somatic health later during adulthood. Their research methodology incorporated reviewing the previous literature in the said fields to summarize the results in a qualitative overview.

The results indicated that in adulthood, the history of ACE has the potential of culminating into complex clinical profiles, such as post-traumatic stress disorder, depression, borderline personality, diabetes, and obesity. The study also opines that during certain developmental stages, the risk for disorders related to ACE is more (Herzog & Schmahl, 2018). Certainly, there is increasing evidence that there are sensitive periods and a period of ACE subtypes that are essential in the development of neurobiological development. Critically, the study pointed out that pre-disposition to ACE affects the developmental aspects of the individual

even during adulthood. Specifically, the study has outlined changes in mental development associated with ACE. Towards this aspect, the functional and volumetric changes of the hippocampus and amygdala have been pointed out to change as a result of ACE. In their contribution to the topic of ACE on general populations.

Hughes et al. (2017) noted that early life experiences significantly influence the health of an individual. Also, ACE impact on the health of an individual throughout their entire life. Their study specifically focused on quantifying effects of ACE on the health of individuals predisposed to these conditions. Their meta-analysis and systematic review applied the methodology of searching five electronic databases for cohort studies across-sectional case controls. The articles that were published in the last five years were examined for their suitability in this underrating. The study sought to include articles that used participants of more than 18 years. Their results pointed out that individuals with multiple ACES are predisposed to major risk factors for several health conditions. Technically, those individuals with ACE were seen to have more complications related to ACE in the long run (Hughes et al., 2017).

The findings by Geddes et al. (2013) indicated that ACE impacted negatively on the mental health of an individual. Hughes et al. (2017) added to this topic by conducting a meta-analytical study in examining the influence of ACE on the overall health. Both authors used a similar study method in assessing the topic under study. Their studies were uniform in pointing out to ACE as having a significant impact on the health of the individuals. However, these studies are imperative in adding to the current topic of the effects of ACE on the traumatized population.

Exposure to adverse events during childhood contributes to negative health outcomes in the long run. ACE's have been associated with an increase in health risk and a primary

contributor to chronic diseases. Different authors have studied the implications of adverse effects on the health and wellbeing of children. Brown, King, and Wissow (2017) define adverse effects as discrete or ongoing events that are outside the control of the child and are perceived to be negative by the child. They argue that the culmination of adverse experiences can cause negative effects on physiological, behavioral, cognitive, and physiological functions. Different studies conducted by authors pointed out that more than 17,000 adult patients, representing 64% of the sampled individuals, were predisposed to at least one ACE during their lifetime (Brown et al., 2017). ACE can contribute to several other disorders and health complications. For instance, a study conducted by Davis et al. (2019) pointed out that obesity among children in Minnesota was significantly attributed to ACE. This increases health challenges for the individuals. An adolescent who reported cases of ACE were 1.5 times more likely to be overweight, obese or being severely obese. The study, however, failed to find any relationship between underweight and ACE (Davis et al., 2019).

Synthesis

Studies have established that ACEs have an effect on the neurobiological, psychosocial, and somatic conditions of their patients during their lives. The effects are not limited to the childhood of the individuals only as they can manifest even in adulthood. For instance, children that have been subjected to sexual abuse can experience sexual trauma all their lives, an aspect that can adversely affect their reproductive health. Children that were victims of ACEs are likely to develop post-traumatic stress disorder (PTSD). PTSD can affect these children, even when they become adults. Depression, stress, and anxiety are some of the long-term effects that ACEs can have on the victims throughout their lives. As a result, the victims are at an increased risk of developing eating disorders that can either make them obese or anorexic. They may also develop

a stroke due to stress. It can thus be deduced that indeed, ACEs lead to poor health outcomes for the victims

Importance of Secondary Prevention of ACEs

Secondary prevention of ACE is imperative to prevent the occurrence of more chronic and lethal health effects. Early intervention can reduce significant instances of ACE that culminates in more challenges. More than 40% of the youths in the U.S. are predisposed to ACEs, and these conditions have cumulatively had pernicious effects on lifelong health. It is on this basis that Barnes et al. (2019) sought to examine preventive approaches for ACE to eliminate negative health-associated thereto. The research primarily focused on the lack of standards and accurate clinical assessment tools for ACE. They noted that the lack of effective biomarkers in the topic of ACE has led to the culmination of stress among the individuals predisposed to that condition.

The study purposed to examine ACEs' preventive measures to avert chronic illnesses in pediatric clinical care. The study identified the evidence for identification approaches and the potentiality for screening tools that could lead to early detection of the challenge. Their results pointed out that there are minimal screening tools to allow for easier identification of ACE in pediatric settings. They concluded that early identification of ACE not only allows for mitigation of circumstances that may lead to such conditions but also allows for easier identification of intervention approaches in improving an individual’s overall health (Barnes et al., 2019).

Vervoort-Schel et al. (2018) similarity studied approaches to identify and manage challenges associated with ACE among children with disabilities. They noted that ACEs interfere with the recovery process of individuals with a disability. Therefore, there is a need to identify such challenges early and address them. Their research points out that deficiencies in

adaptive and intellectual functioning and living circumstances can increase the vulnerabilities of individuals to adversities. Their exploratory study analyzed 68 case files of children who had been referred to a Dutch national center for residential youth care. The study found out that 49.3% of the children experienced at least two ACEs from the original ACE mean. Besides, the study found an imperative attribute in that both children and parent ACE were related to trauma and attachment. Besides, the living conditions and the environment a child is predisposed to during the early development stages significantly influence their ACE. The study concluded with a hypothesis that identification of ACE challenges during the early development stages of a child plays a key role in addressing health complications that may arise thereafter (Vervoort-Schel et al., 2018).

Synthesis

Once individuals have been subjects to ACEs, only one thing can be done to help their situation, secondary prevention. If at all, everything was perfect, the individuals would not have found themselves as the victims as everything would have been prevented. On the other hand, failing to act once the adverse events have happened only leaves the victims more vulnerable. As such, it is vital that the secondary prevention of ACEs is carried. Such is because it would help protect the victims from enduring the more adverse effects of ACEs. Secondary prevention can help reduce the number of ACEs victims that have health problems emanating from the impact of the adverse events they were subjected to. One aspect that can facilitate secondary prevention is the identification of ACE challenges. The identification can be done during early childhood and can help the children grow up normally, not having to live with the effects of ACEs.

ACEs and Attention Deficit Hyperactivity Disorder (ADHD)

ADHD is a very prevalent, common behavioral and developmental disorder. Children are usually diagnosed with ADHD after displaying inappropriate levels of hyperactivity, impulsivity, and inattention. Children under the protection department that have been diagnosed with Post Traumatic Stress Disorder (PTSD) due to issues like neglect have often been reported to experience other mental health disorders including anxiety, lack of sleep and depression (Sayal, Prasad, Daley, & Ford, 2018). Similarly, health care providers who have diagnosed children with ADHD have based their diagnoses on health disorders including lack of sleep and concentration, anxiety and depression. Baker, Hides, and Lubman (2015) compared the parts of the brain that are affected by ADHD and PTSD. The results showed significant similarities between the parts of the brain affected by both disorders. The parts of the brain most affected by PTSD and ADHD include the parts associated with emotional regulation, decision making, semantic memory, and social processing. The study thus concluded that a child who is suffering from ADHD and a different child who has been exposed to ACEs may both have challenges managing emotions, processing sensory information, and being attentive (Baker et al., 2015). Thus, there is a close relationship between ADHD and trauma.

The Diagnostic and Statistical Manual of Mental Disorders (DSM) is a major diagnostic tool that is used by clinicians around the world. After closing examining the differences and similarities between trauma and ADHD, studies concluded that there was a real need to reclassify the diagnoses for children who have been misdiagnosed due to the overlap between the symptoms of ADHD and interpersonal trauma. The study defined interpersonal trauma as the personal experiences witnessed and whereby the witness became traumatized after witnessing the events. Such experiences may include domestic violence, sexual assault and physical torture

among others. The study by van der Kolk, Pynoos, Cicchetti, and Cloitre (2009) involved 1,699 children who had experienced personal trauma in their early childhood ages. The study found that most of the children who had experienced traumatic events were later diagnosed with ADHD since a diagnosis-specific for trauma had not been developed. The researchers proposed that DSM should consider adopting the Developmental Trauma Disorder (DTD) diagnosis for children who experienced trauma. However, the proposal was dismissed during the formulation of the 5th edition of DSM in 2013 and trauma was classified as hyperactivity and attention problems. Thus, children who have experienced trauma in their lives continue to be diagnosed with ADHD. Under the current diagnosis policy for behavioral disorders, mild and moderate presentations of ADHD may be eligible for a diagnosis. The conflict and relationship between trauma and ADHD necessitate more studies on the subject.

To move from what has been referred to as "clinical subjectivity" of ADHD diagnosis, health care professionals should widen their knowledge base before diagnosing a child with ADHD. For example, when a child who has experienced personal or relational trauma in their life sought diagnosis, the health care professional should question the diagnostic pathway for ADHD and administer alternative measures that would be related to trauma. By doing so, the professional would reduce the chances of misdiagnosis and provide the most preferable intervention measure. Thus, in the study of behavioral disorders, ADHD and trauma cannot be studied independently.

Synthesis

Whenever children realize that they are not receiving enough attention, they tend to become hyperactive in a bid to demand attention subtly. If this trend goes on for too long, it becomes a disorder; attention deficit hyperactivity disorder (ADHD). ADHD is caused by

neglect and manifests in the form of impulsivity and hyperactivity. It may make the children suffer from PTSD, insomnia, depression, anxiety, emotional instability, and social awkwardness. These effects are due to the fact that ADHD affects the regions of the brain that are usually affected by PTSD. Though closely related, the two are not the same. More research thus needs to be done to distinguish PTSD and ADHD as they currently overlap.

ACEs Assessment

Health questionnaires are useful in the identification of the challenges in pediatrics. These questionnaires are essential in finding out the challenges that children are exposed to during their earlier growth stages and the association that these challenges have with the later life health outcomes of such individuals. The assessment of ACE in children allows for early intervention and treatments in case of lethal consequences. Therefore, the application of rational tools in the assessment is imperative not only to allow for diagnosis but also to mitigate hazardous events associated with ACE (Koita et al., 2018). According to Zarse et al. (2019), the application of adverse childhood experience questionnaires is imperative in finding instances of ACE among children. The study utilized previous researches to draw reviews of different authors to the use of ACE questionnaires. The study sought to understand the causal roots of common, interlinked comorbidities of the body and brain. After thorough analysis and research of the paper, the study found out that exposure of children to ACE is associated with a wide array of interlinked mental illnesses, multi-organ medical diseases, as well as addictions. The study applied ACE-Q in a survey done in an urban pediatric care setting. Application for a rapid cycle assessment was used to change the information instrument applied. The questionnaires were administered to 28 caregivers, consisting of 16 health providers. Some of the caregivers reported

having discomfort with sexual abuse, community violence, and being separated from their caregivers.

Both studies by Zarse et al. (2019) and Bethell et al. (2017) pointed out the need for the application of ACE-Q in addressing the challenges faced by children and the environments that are predisposed to. Bethell et al. (2017) however, went further in assessing the suitability of ACE-Q in addressing SSNR disruption as a result of ACE. The study found out that ACE-Q is imperative in this undertaking. Zarse et al. (2019) on the other hand, found out that the ACE-Q approach was imperative in addressing ACE in children, although it could not be relied upon in identifying fetal or genetic exposures. These studies, however, attained uniformity in corroboration with the notion that identification of effective tools in assessing ACE not only allows for better health outcomes but also enhances full management of the challenge.

Bethell et al., (2017) contributes to this topic by pointing out that advancement in technology has also advanced assessment methods applicable in ACE. The disruption of safe, stable and nurturing family relationships (SSNR's) such as ACE is significantly related to an increase in trauma and chronic toxic stress. The methodology included identification and comparison of different methods to identify ACE among children and families.

Lee Oh et al. (2018) examined 32 different assessment tools for measuring ACE adversity in children and adolescents and identified ACE questionnaires as being effective. Another study (Bethell et al., 2017) evaluated the validity and acceptability of the ACE-Q approach in identifying such challenges. The results indicated that 50% of the ACE identification approaches have been applied in clinical settings. These methods have proved to be effective in identifying the causative agents of ACE among children (Bethell et al., 2017). These findings indicate that adopting an effective and efficient approach in finding the relationship between

ACE and individual health is imperative. These findings have certain policy implications. First, researchers are compelled to adopt ACE-Q approaches in identifying accompanying factors leading to ACE. Secondly, the results point out that as a result of using the ACE-Q approach, there is a consistent and similar association between adverse experiences and poor health associated thereto.

In addition, the World Health Organization (WHO, 2011) recommends ACE-Q as an imperative tool in assessing the potential risks attributed to ACE. Several regions in the U.S. have adopted the ACEs-Q framework through the application of this system into their behavioral risk factor surveillance system. WHO (2011) notes that the application of ACE has the potential of reducing the unreliability of data, acceptability, as well as attaining reliable actionable information about addressing challenges associated with ACE.

Synthesis

Some of the symptoms that are exhibited by ACE patients can be misdiagnosed for other health conditions. It is thus critical that adequate assessment is carried out so that the healthcare professionals are certain that they are dealing with ACE. To achieve this, healthcare professionals should carry out an assessment. Health questionnaires can be a handy tool in the process of assessing children to ascertain what they are suffering from. As had been pointed out earlier in this undertaking, secondary prevention can help protect children from the adverse effects of ACE. With that said, therefore, the first step towards secondary prevention is ACE assessment. ACE questionnaire assessment (ACE-Q) can help in the evaluation of the risks that are associated with ACE hence mitigate the potential adverse effects of ACE on the health and the general health of the patients.

Screening ACEs Beyond Individual Level

The increase in relevance of ACE and their association with a wide variety of negative outcomes calls for the need to prioritize the prevention of ACE. Glowa et al. (2016), however, noted that focus on primary preventive measures in which the incidents of ACE are reduced significantly has the greatest social and societal impact. Therefore, to accomplish the objectives, interventions should focus on strengthening individual and community resilience rather than solely identifying and responding to individual ACE. This proposition is drawn from the rationale that there is power in numbers and working in a community is more successful than adopting interventions that will primarily focus on one individual or family.

In the recent past, there has been increased cognition of the need to mitigate the negative effects that ACE has on development and health. According to Schickedanz, Halfon, Sastry, and Chung (2018), the importance of screening for any ACE cannot be underestimated. However, this undertaking may be inhibited by concerns about parental perceptions, therefore, there is an increasing need to adopt effective yet efficient measures that will allow for in-depth evaluation of such challenges. Thus, parental perceptions may act to hinder effective screening. Schickedanz et al. (2018) applied semi-structured questionnaires in assessing the perception of parents and the potentiality of effective screening being hindered by such perceptions. The results indicated that parents were in an agreement that the ACE screen is imperative in determining adverse health effects. Also, the study pointed out that pediatricians and parents played a key role in determining the success of screening tools applied in this perspective. The study concluded that there is a need to ensure that pediatrician have the necessary skills since they play a key role in mediating between parents and pediatric patients (Schickedanz et al., 2018).

There is an established relationship between ACE and poor health outcomes. Whilst there has been increased attention from stakeholders to address ACE, there is, even more, a need to adopt effective and comprehensive strategies that will prevent children's exposure to ACE. According to Hughes et al. (2017), exposure of children to ACE can be prevented through promotional strategies and approaches that will ensure all the children will have access to stable, safe and nurturing relationships, as well as their environment. Through this approach, the experience of parents during the early developmental stages dictates the coping strategies of children exposed to ACE. According to Lange, Callinan, and Smith (2019), ACE has a significant relationship with parenting stress and practices. Lange et al. (2019) argued that trauma presents a significant public health challenge, given its recurrent practice more so in the U.S. They argue that ACE is one of the conceptualizations of trauma that has gained increased attention in the recent decade (Lange et al., 2019). They also noted that ACEs may influence parental care during the later developmental stages.

The childhood neighborhood environment dictates their overall health and impact significantly on their behavioral attributes (Baglivio et al., 2017). While interventions at the community level have been pointed out to be effective in addressing ACE, Lange et al. (2019) found out that these interventions approaches are not effective and are rare. For instance, three out of seventeen interventions towards community ACE were ineffective and inefficient in attaining the desired output. The study revealed a positive parental program (Triple-P) as a good example of a universal program that is aimed at supporting positive parenting at the family, individual, and community level (Lange et al., 2019). This is achieved through the targeted campaign and social education. Interventions could be targeted at an individual and family level. Zarse et al. (2019) cite child protection service agencies as one of the best interventions in

different countries that are imperative in addressing the challenges of child maltreatment. However, new programs attempt to identify and respond to adverse experiences before they happen, and even prevent instances of such occurrences happening (Zarse et al., 2019).

Synthesis

Going by the number of people that have been diagnosed with ACE, it is safe to say that it is widespread. This means that there are elements that are common and widespread and that is the reason why ACE is widespread. Dealing with individual cases is thus not the best way to deal with it as more cases will keep coming up. Instead, screening should be done beyond the individual level as that will help identify the common element in the collective unit. Such an element may be a risk factor and addressing it may help reduce the increasing cases of ACE. One of the ways that this can be achieved is to shift focus to the community. It is through screening the community that risk factors can be identified and adequately addressed. However, challenges posed by a collective unit such as a community must first be overcome. Screening the community can help improve the environments within which children are brought up by promoting supportive parenting. Individual screening cannot achieve this.

Role of Primary Care in Addressing Children with ACEs

The role of primary care includes the ability to provide a better, safe, and multi-generational place for information and advice. According to a study done by Zeanah and Sonuga-Barke (2016) primary care is obliged to address change associated with trauma and the health of children. Besides, primary care can achieve much to an individual's health. Collaboration and coordination for primary care, specialty, and community care have been pointed out as playing a key role in addressing challenges arising from ACE (Zeanah & Sonuga-Barke, 2016).

Halfon et al. (2017) noted that as opposed to traditional care for ACE, integrated care involves detection and referral. This can positively influence the mental stability of the participants. Trials that have been done to trained clinicians have achieved significant success in the long run in addressing challenges of depression and behavioral challenges among the youths (Halfon et al., 2017). The success of these structures does not only depend on their structure, but also on how clinicians in primary care settings build a relationship with the clients. In a meta-analysis study involving intervention efforts aimed at addressing depression among the adults, there was a little association between the extent to which programs had structural elements of integrating into place and the odds of patient's improvement (Davis, Schubert, & Costigan, 2017). This study also pointed out that improving children's care is made possible through easy referral electronically and the adoption of universal screening in primary care centers.

Prevention of ACE is made possible through the adoption of effective approaches that not only mitigate instances of child neglect but also attempts to address such challenges when they happen. Interventions that seek to address challenges of trauma and distress in children must be formulated to allow for preventive as opposed to curative interventions. Ports et al. (2017) noted that individuals, families, communities, and the authorities have a role to play in addressing the challenges of ACE and associated comorbidities. Health care providers are imperative ingredients in identifying children to patients who are at risk (Ports et al., 2017). Besides, primary care experts could play a dual role in the generation of an approach to ACE screening and can contact the family of a patient directly to recommend appropriate services that are imperative in the reduction of harm. The corporates and authorities, on the other hand, are tasked with coming up with a policy framework or advancing critical leadership and insight to policies that aim to strengthen economic security. Preventive approaches are aimed primarily at

preventing cases of negative health effects before their occurrence or manifestation of individuals. Levenson et al. (2015) noted that downstream prevention activities at the individual level incorporate screening for ACE disorders, safety planning, mental health treatment, and education in access to environments that can predispose one to trauma (Levenson et al., 2015). At the community level, organizations, and communities have come up with an intervention approach that works to dismally reduce cases of trauma among children.

Synthesis

As Zeanah & Sonuga-Barke (2016) aptly put it, the objective of primary care is to address any changes in the health of children (in the context of this study). However, at the rate in which cases of ACEs are increasing, primary care alone will not be enough. As such, it is prudent that there is a collaboration between primary care and community care in order to tackle ACEs. Primary care brings to the fore the primary care professionals who have the crucial responsibility of identifying the children that have experienced ACEs by assessing them. The primary care professionals can also play the role of generating an appropriate approach that can help in the screening of ACE. Efficient primary care can thus help mitigate the effects of ACEs on children hence helping ensure that they have a healthy life

Summary of Literature Review

The research findings discussed in this session are essential in guiding the current research. Besides, the literature discussed herein has pointed out to ACE as being an imperative topic that needs to be focused on in-depth. This literature has shed light on the lethality associated with ACE since it impacts on the long-life health of an individual. As pointed by Davis et al. (2019), ACE has a significant association with the health and wellbeing of an individual. Significantly, the literature has pointed out the need for effective screening methods

that will not only identify the extent of ACE, but also the one that presents solutions to such challenges. The majority of the researchers have recommended the use of ACE-Q in the identification of traumatic events among children. Zarse et al. (2019), however, pointed out that this method has some limitations since it cannot be used to evaluate damages done by ACE to somatic or genetic components. The findings from this literature have indicated that the presence of ACE among children or adolescents impact significantly on their health. Towards this approach, there is a significant association between ACE and the health of an individual. Traumatic events have also been shown to increase the likelihood of the development of suicidal behaviors. From the foregoing discussion, the conclusion drawn from this literature is that ACE influences the overall health outcomes of children during their adult life. This includes poor physical stability, poor emotional, intellectual and mental stability, as well as low health immunity. However, the literature has indicated that earlier screening enables the prevention of such challenges before damages are done. Most importantly, the role that primary care providers play in the identification of ACE and communicating to families on the best intervention to reduce such issues. The literature has indicated that everyone has a role to play in addressing the challenges that are presented by ACE, even before their manifestation.

Synthesis

The literature review has looked into different works of literature that have been published by different researchers to help put the problem of ACE into context. Various aspects of ACE have been discussed, including its effect on the health of its patients, its association aggressive as well as risky behaviors, the importance of assessing it, and the role that primary care plays in controlling it. Collectively, the discussion in the literature review gives an insight into ACEs by discussing its risk factors and the possible ways that can be used to control it. For

instance, risky behaviors are coping mechanisms for the victims who are enduring the effects of ACEs, such as depression and anxiety. Moreover, taking a communal approach to address that causes of ACEs has been pointed out as a more effective measure as compared to screening and diagnosing individuals.

Theoretical Framework

The Knowledge to Action (KTA) model is the quality improvement (QI) framework for directing the process of Knowledge translation (KT). KTA will be used for this study. Originated in 2006 by Graham, Logan, Harrison, Straus, Tetroe, and Robinson in Canada to ease the implementation and sustainability of a practice change. The gap between final users known and what is done is called described as Knowledge to action gap (Lee & Kendall, 2019).

The framework (see Appendix D) has two related but distinct parts – a 3-phase funnel shape of Knowledge Creation encircled by an Action Cycle. The three phases of knowledge creation are knowledge inquiry, knowledge synthesis, and knowledge tools/products. Screening of children ages 0-12 is not a standard of practice for patients coming for wellness care/routine at the project site as disclosed by the site providers. Parents have never had a conversation with their healthcare providers regarding the cascading effects of trauma and toxic stress associated with ACEs. This is a knowledge gap and it requires educational intervention. Knowledge action has seven stages which include identifying the problem, adapting knowledge to local, assessing barriers to knowledge use, selecting, tailoring, implementing the intervention, monitoring knowledge use, evaluating outcomes, and sustaining knowledge.

In summary, the DNP project will identify children ages 0-12 at the project site are not being screened for ACEs exposure (Identify Problem), collaborate with clinical staff and children’s parents (Adapt Knowledge to Local Context, Assess Barriers to Knowledge Use), and

implement education and a brief screening (Select, Tailor, and Implement an Intervention). Throughout the intervention, implementation and performance outcomes of the intervention will be evaluated by medical chart reviews (Monitor Knowledge Use, Evaluate Outcomes). Annual e-learning, new staff orientation to ACE-Q screening, integration of ACE-Q in EHR, and patient/family education will be proposed (Sustain Knowledge Use). This is a knowledge gap.

Adapt Knowledge to Local Context

Initial meeting with providers and clerical/support staff, understanding their related perspective towards the project, support/nonsupport. This will take place once for each eligible patient. Each patient will get Relevant Symptomology flyers easy-to-read in English only.

Assess Barriers to Knowledge Use

Barriers such as time constraints during a patient's visit, lack information/resources on the method to assess and collateral information, provider participation, and parent cooperation.

Select, Tailor, and Implement an Intervention

DNP student will identify selected tools, tailor education towards stakeholders (provider, clinical staff, clerical/support staff, patients and family) using flyers to disseminate information and immediately notify MD of any patient tested positive for ACE-Q.

Monitor Knowledge Use

To understand how and extent the KT has impacted outcomes, DNP student will employe weekly chart review to monitor compliances.

Evaluate Outcomes

Quantitative analytical methods will be used in the evaluation of this QI DNP project, including Microsoft Excel for data management to analyze the number of ACEs exposure, compliance, and appropriate referrals.

Sustain Knowledge Use

Annual e-learning, new staff orientation to ACE-Q screening, integration of ACE-Q in EHR, and patient/family education. Periodic compliance checks, modeling and monitoring best behavior.

Methodology

Design of Project

Descriptive quality improvement (QI) design was employed for this Doctor of Nursing Practice (DNP) project.

Setting

The setting for the DNP project is a private pediatric clinic in northern, New Jersey. The office staff consists of two pediatricians, three family nurse practitioners, an office manager, and three medical assistants. The primary language is English. The hours of operation: Mondays 10am to 4pm, Tuesdays 2pm to 6pm, Wednesdays 10am to 4pm, and Fridays 8:30am to 2:30pm. The provider see 12 to 25 patients daily.

Study Population

The target population entails pediatricians and nurse practitioners in the project site. To be eligible for this QI project, the physician (board certified pediatrics or family medicine) or nurse practitioners. Currently in the clinical practice at an outpatient pediatric primary care clinic in northern, NJ. The providers are willing to use ACEs-Q. Non-full time providers were excluded (See Appendix E for Eligibility Criteria).

Subject Recruitment

The DNP student began the recruitment process at the project site after being approved by IRB (See Appendix F for the Recruitment Flyer). The DNP student carried out a-1 hour

training session that gave details of the project to the providers, the expectations, and ethical considerations. Since this DNP project involves implementation of standard of care, no subject recruitments were necessary.

Consent Procedures

Consent to take part in the DNP project was obtained with participant's signature. The DNP student involved in discussing the methodology, purpose, risks and benefits of the study with the site providers. The project is a standard of care. There were no recruitment of children or vulnerable population in the study.

Risks/Harms

Screening ACEs may not pose greater risks than procedures currently available to this population and would be classified as minimal risk. The primary risk is associated with any psychological discomfort in asking children's ACEs to their clients, but it would not greater than those ordinarily encountered during their usual care settings. All information shared in the meeting will be held confidential. To ensure privacy and confidentiality, all extracted data will be de-identified and saved in a password-protected computer and electronic device.

Subject Costs and Compensation

No compensation for participants will be provided. No monetary expenses will be incurred from participating in this study.

Study Intervention

Knowledge to Action model was used to guide this DNP project. An educational intervention was adopted, including a-1 hour paper presentation stating the background of the original ACE, who, what, and why was this patient population is at risk, the importance of screening, how to overcome barriers, and screening for ACEs in the site. All providers received

the same educational intervention. Attendance was tracked when providers completed the training. The participants reported how often they used CYW ACEs-Q during their practice on a weekly basis for a period of 2 month (on a 5-point Likert scale ranging from never to always). At the end of the proposed project, the participants completed a questionnaire to report their perception of having sufficient time to screen, the comfort level of screening sensitive information, barriers, and resources for positive screening, satisfaction on the use of the newly implemented screening tool and willingness to introduce CYW ACEs-Q to other providers (on a 5-point Likert scale ranging from strongly disagree to strongly agree). See Appendix G. The DNP student was on the site to oversee how the screening tool is being done, the scoring and result interpretation.

Intervention screening tool (ACEs-Q)

The Child CYW ACEs-Q, a standardized tool was employed to measure childhood trauma, toxic stress, abuse, and neglect in the early life of a person (Appendix H). The Child CYW ACEs-Q covers fundamental aspects of traumatic events among the children, including alcoholism, physical assault, sexual assault, and family support, among others. The questionnaire will thus provide enough information concerning the child (Center for Youth Wellness [CYW], 2015).

The tool consists of original 10 question items created by Felitti and Anda in 1998 (Steele et al., 2016) and an additional 7 items which quantify cumulative exposure to ACEs in patient age 0-12 (CYW, 2015). ACEs types (see Appendix I) include Abuse (physical, emotional & sexual), Neglect (physical, emotional) and Household Dysfunction (mental illness, mother treated violently, divorce, incarcerated relative, and substance abuse). An example of ACEs-Q questions: At any point since your child was born, your child's parents or guardians were

separated or divorced? (see Appendix H for the full list of screening questions). The tool is obtainable in three different age categories (Child, Teen & Teen Self-report), both in English and Spanish and takes about two to five minutes to complete. The reliability and validity of CYW ACEs-Q data are under development; however, most recommended and a feasible measure of ACEs in children and adolescents (Lee Oh et al., 2018).

Scoring and Interpretation of Results

The participants report how many adversities from the list of ACEs-Q apply to their children. The Co-I will tally the number of each section and total in the box**.** An example, if 3 in section 1 and 2 in section 2, the score of ACEs-Q will be 5. In addition, relevant symptoms will be checked. Some of the symptom examples are sleep disturbance, poor impulse control, school failure or absenteeism, and weight gain or loss (see Appendix H for the full list of relevant symptoms). If children do not have any relevant symptoms and CYW ACEs-Q score is between 0 and 3, they will receive anticipatory guidance. If children experience any relevant symptoms and CYW ACEs-Q score is 1-3, a referral for treatments will be recommended. Regardless of symptoms, any children with ≥ 4 of ACEs-Q score will need a referral for treatments, too (see Appendix H for the interpretation).

Outcomes to be Measured and Debriefing

The increase in knowledge of the providers regarding needs to screen all patient for ACEs evidenced by survey questionnaires assessing provider's perception of having sufficient time to screen, the comfort level of screening sensitive information, barriers and resources for positive screening using a 5-point Likert scale with questions ranging from strongly disagree to strongly agree (Appendix G). The increase number of screening tools collected weekly over 8

weeks that results to early detection of ACEs and referrals. Percentage of providers who utilized the screening tool weekly over 8 weeks period of the study.

Project Timeline

The DNP Project process began with proposal writing which includes searching and obtaining literature that answers clinical questions and support proposed intervention. Once the project proposal is completed, the DNP student received the university IRB approval to carry out and implement the DNP project on the site. The DNP project runs from December 2019 through January 2021 (Appendix J).

Resources Needed

The primary care office provided space for the recruitment and implementation of the study. There was no charge by the site for the DNP student to use the office. The DNP student would not acquire any forms of payment. The main source of funds for the study would be the student's financing. The budget for the DNP project was shown in Appendix K.

Evaluation Plan

Data Maintenance/Security

The DNP student has completed appropriate certificates of training for human subject's protection and HIPAA. As required by the IRB and to protect participants' anonymity and confidentiality, all information obtained from participants was de-identified. The subjects were referred to as "Provider 1, Provider 2, Provider 3, Provider 4, and Provider 5." Any data would not be linked with their personal information and kept secured in a password-protected computer. All data files were password protected. Participants were assigned a project ID number to protect their identity on the demographic information. The data will be retained for at least 6 years after

the completion of the project or publication of the results, whichever is later, and preferably indefinitely.

Data Analysis

Descriptive statistics were used to describe and summarize the data (e.g., frequency and percentages). The Friedman test (the non-parametric alternative to repeated measures ANOVA) was employed to examine the change in the weekly usage of ACE-Q with the clients over the 8-week project period. Data were analyzed by using IBM SPSS Statistics for Windows (Version 27, Armonk, NY, USA). A p-value less than 0.05 is statistically significant.

Results

Five providers successfully completed the training session and pre-survey and post-survey. A Friedman test indicated that frequency to use ACEs-Q were significantly changed over the 8-week period ($\chi^2(7)=30.333$, $p < .001$). According to Ad-hoc pairwise comparisons (Figure 1), there were significant increases in the frequency to use ACEs-Q between week 1 and week 7 ($p = .017$) and week 1 and week 8 ($p = .005$).

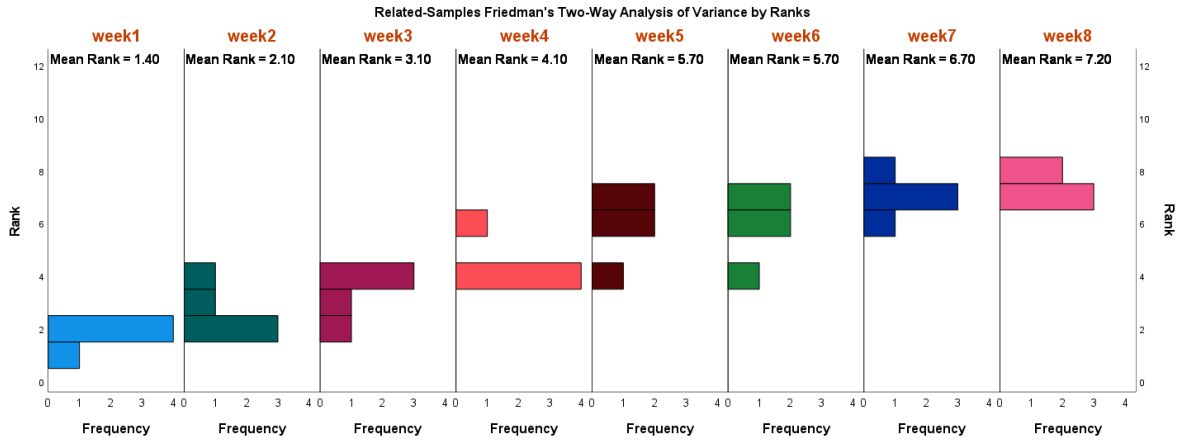

Figure 1. The Change in Frequncy of Using ACEs-Q

When it comes to perceptions of using ACEs-Q (Table 1), there were positive responses (i.e., agree or strongly agree) to having sufficient time to screen ACEs, feeling comfortable in screening sensitive information, having more resources than barrier to use ACEs, being satisfied using ACEs and willingness to introduce ACEs to other provider. However, some of participants did not select either positive or negative responses (i.e., undecide) to having sufficient time to screen ACEs (20%) and feeling comfortable in screening sensitive information (40%). There were no negative responses to having more resources than barriers to use ACEs, being satisfied with using ACEs and willingness/ready to introduce ACEs-Q to other providers.

Table 1. Perception of Using ACEs-Q

	Perceptions of Using ACEs-Q				
	Having sufficient time to screen ACEs	Feeling comfortable in screening sensitive information	Having more resources than barriers to use ACEs-Q	Being satisfied with using ACEs-Q	Willing/ready to introduce ACEs-Q to other providers
Strongly Disagree	0	0	0	0	0
Disagree	0	0	0	0	0
Undecided	1	2	0	0	0
Agree	4	3	3	2	3
Strongly Agree	0	0	2	3	2
Total (n)	5	5	5	5	5

Discussions and Implications

Economics/Cost

Lack of financial security for families influences intergenerational outcomes. ACEs affect the wealth of a nation, consumer spending, tax revenue, and low productivity. The estimated U.S. population's economic burden said to be $428 billion for lifetime costs incurred per annum (NJACES, 2019). Thus, there is increased childhood and adult healthcare costs, public expenditures on child welfare, special education, and dropout.

Clinical Practice

The primary care practice is simply the ideal site for routine screening for ACEs. In this regard, AAP recommends universal routine screening of ACEs in pediatrics (AAP, 2015). This DNP project is for the screening of ACEs in a pediatric primary care setting. The project findings indicated that the clinicians have demonstrated awareness, interest and willingness to continue use of CYW ACEs-Q routinely in the practice evident by significant change in the weekly usage. This is expected to be extended to hospital, pediatric, family, and urgent care. This will support early detection and increase public/private awareness of ACEs.and appropriate referral.

Health Policy

Childhood experiences impact significantly on the mental stability and overall health of an individual. The policy implication is the need for preventive programs and intervention against ACEs challenges (Downey et al., 2017). Healthcare policies should aid families access available services that would support their physical and emotional wellbeing. Research shows that Medicaid beneficiaries are at greater risk of experiencing ACEs yet having difficulty behavioral health services due to scarcity of providers and discouraging payment system (NJACES, 2019).

Impact on Healthcare Quality and Safety

Early intervention and diagnostic therapies are critical for ensuring that ACEs challenges are addressed before they advance to being lethal. Also, the implantation of ACE screening will enhance parents/guidance awareness about ACEs and its implications in children’s health.

Education

Extensive research has been done on early childhood development and untold adversities effects of ACEs on health outcomes. Many are yet to understand or familiar with the

implications of early childhood trauma and the available resources including tools that can help screen children/adolescents at risk and appropriate referral. Practitioners in New Jersey have ascertained lack of ACEs understanding as a vital issue and advocate the incorporation of ACEs awareness education is necessary towards a statewide feat to protect children from experiencing ACEs (NJACES, 2019). The clinicans need more training to screen sensitive information with their clients. It is imperative to understand from the study that 3 participants (60%) agree to this question while 2 (40%) is undecided.

Translation

This study has shown significant usage of CYW ACEs-Q over 8 weeks period, in other words, it can be said that this study can be translated to clinical use in pediatrician offices, urgent care, primary care, and hospitals. Children's specialized hospitals should have ACEs flyers/pamphlets available for patients/parents/ guardians in the discharge education and possibly in the waiting room through media during wellness visits. The findings of the current study appear useful for all stakeholders (patients, parents/guardians, providers, and the public) in the health care system. The results would be translated into a broader context and made available in various capacities. The providers appear to be more interested and willing to continue use of the CYW ACEs-Q.

Plans for Dissemination and Professional Reporting

After the DNP project is completed, the findings as an aggregate format will be shared with the project site. The findings from this DNP project will be presented to the Rutgers School of Nursing faculty and students as well as professional conferences. Dissemination of information to educate all stakeholders the pressing need for screening ACEs in children and

facilitate practice change and easily translated for use in pediatric offices. Co-I anticipates disseminating findings of the current study in scholarly publications and formal presentations to intensify ACEs awareness and facilitate practice change.

Plans for Sustainability

The DNP project findings and standardized CYW ACEs-Q is planned to be implemented and incorporated in the project site EHR for sustainability and compliance. The staff in the project site will be required to participate and complete annual e-learning educational materials related to ACEs screening. There would be ongoing training and re-training of new and old staff and compulsory attestation through e-learning. Likewise, there will be an opportunity to evaluate the outcomes of implementation and improvement.

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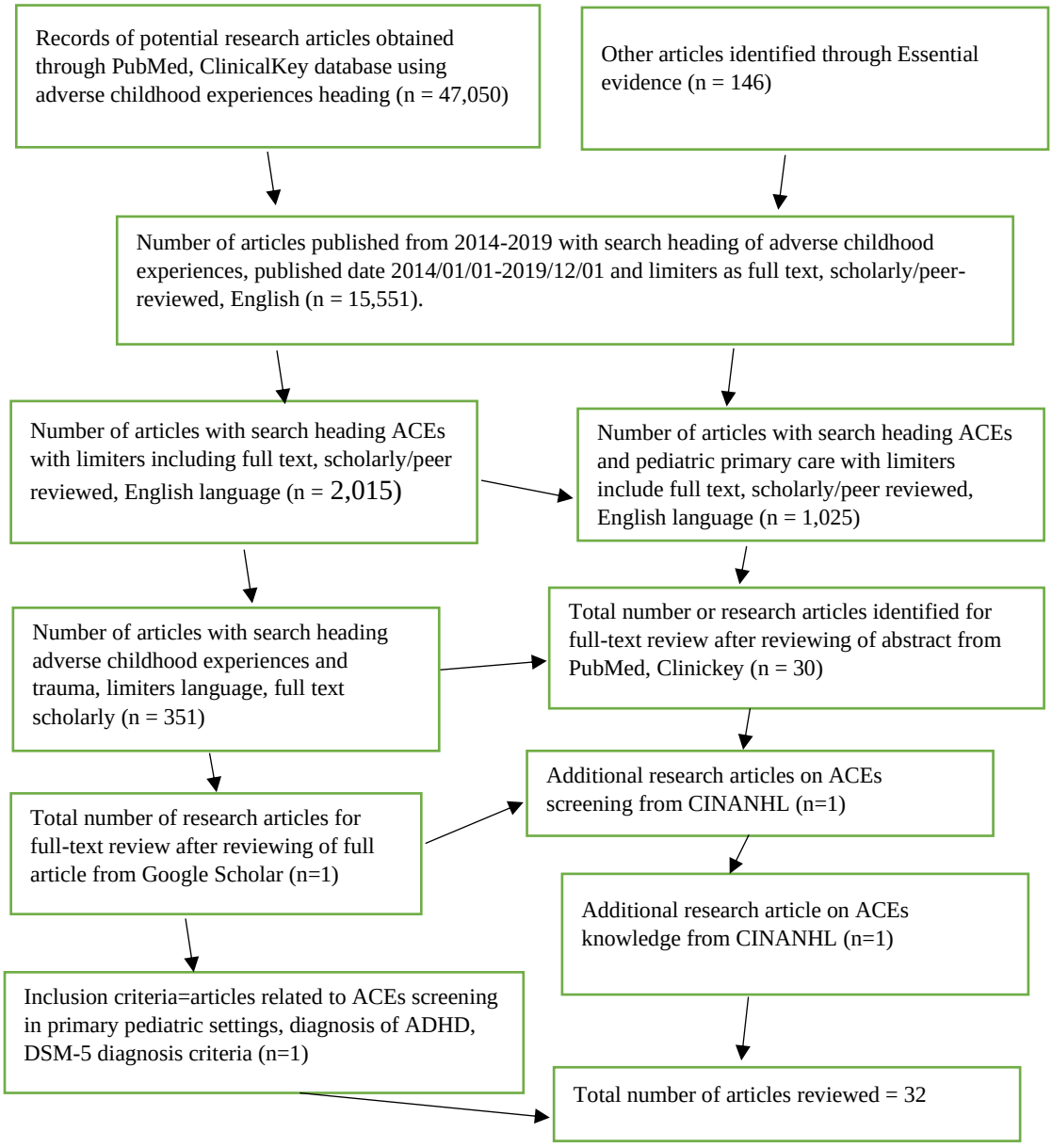
Appendices

A. SWOT Analysis

Strengths	Weakness
The project site has a wide range of patient flow that supports implementation. Provision of culturally sensitive care, availability of space for privacy, willingness to implement ACEs-Q and refer for a higher level of care.	The project site has a small number of staff. The shortage of staff may affect the implementation process. Time constraints due to allotted time to see each patient. Additional workloads would be a challenging and impact acceptability.
Opportunities	Threats
Screening ACEs in a primary care setting during wellness visits that support early detection of mental issues. An increase in awareness and knowledge of ACEs screening of children ages 0-12. Opportunity to train staff on the initiation of ACEs-Q screening. Public funding.	There is a potential threat to patient privacy. The local practice competitors doing the same thing.

Appendix B

B. ACEs PRISMA Flow Diagram



Appendix C

C. Summary Table of Evidence

Article	Author, Date	Evidence Type	Sample, Sample Size, Setting	Study Findings that help answer EBP	Limitations	Evidence Level & Quality
#1	Levenson, J. S., Willi, G. M., & Prescott, D. S. (2015)	Research Quantitative	U.S female sex offenders, between ages 30-60. N=970 N= 47 completed the survey Recruited through a solicitation on the professional listserv of the Association for the Treatment of Sexual Abuser (Arizona, New Jersey, Illinois, Texas, Florida, Georgia, Maryland, Montana, Washington, and Maine.	ACE contributed to aggressive behaviors among female sex children. Their study also found out that in comparing with the general population, sex offenders had more than four times the chances of having ACE and more than three times the chances of experiencing emotional neglect thus, half of the sexual offenders had a history of being sexually abused in childhood. Statistically significant	Small sample size, relied on convenience, limited the size and diversity of the sample. Out of N=970, only n=47 participated. The findings are specific to female offenders in treatment and may not be generalized to those who have not been caught or convicted.	Level III Grade C
#2	Downey, J. C., Gudmunson, C. G., Pang, Y. C., & Lee, K. (2017)	Research Quantitative	A sample of 234 individuals ages 18+ was used. Sample space was Iowa	Result pointed out that the majority of the adults in the region, approximately 58%, have experienced at least one instance of ACE during their childhood. Also, health risk behaviors such as smoking drinking and obesity were significantly associated with ACE experiences.	Data was collected via retrospective self-reported surveys. The study failed to consider the significant level of the association between ACE and deterioration of	Level III Grade C

				Increased rates of depression among sampled individuals were associated with ACE.	health during adulthood.	
#3	Halfon, N., Larson, K., Son, J., Lu, M., & Bethell, H. (2017).	Research Quantitative	The study collected from the 2011-2012 national survey of children's health. N=95677 parents of children 0 to 17 years of age. Applied bivariate and multivariate logistics regression to examine the association between the number of ACE and health of the children of four income groups.	The study pointed out that ACEs can affect health and development across the life span. The result indicated a steep income gradient for the proportion of children who experienced ACE. Statistically significant	The study failed to find higher incomes as a protective factor against ACEs.	Level II Grade B
#4	Zettler, H. R., Wolff, K., Baglivio, M., Craig, J., & Epps, N. (2018)	Research Quantitative	Used a large sample of adjudicated juveniles in Florida N=4,733, age 12 only with the first-ever arrest in 3 years.	ACE increases the odds of residential placement by age 17. Male is more prone to ACE associated challenges in the long run i.e., male was at higher risks of residential placement as a result of ACEs and consistent predictors residential placement across demographic groups are anger challenges, antisocial behavior, and substance use. Statistically significant	Full items of ACEs were not used due to sample represented age 12-year-old and first offenders. Another, the targeted population may have experienced an additional ACE after age 12 that could have affected the residential placement outcome.	Level III Grade B

#5	Glowa, P. T., Olson, A. L., & Johnson, D. J. (2016)	Research Quantitative	111 Adult patients of seven (7) clinicians at a 3 rural clinical practice. N= 127 n=111 Age 18+ Dartmouth CO-OP Primary Care Research Network in Vermont, New Hampshire, and Maine.	The study indicated that the implementation of ACE screening during a wellness visit was feasible and can provide adequate health determinants probably missed. The result indicated that there was a high-risk factor for ACE in 62% of the patients. Statistically significant	Lack of racial diversity, inter-clinician variability and lack of adequate information from patients/inability to follow up after the screening.	Level III Grade B
#6.	Hughes, K., Bellis, M. A., Hardcastle, K. A., Seth, P., Butchart, A., Mikton, C., & Dunne, M. P. (2017).	Research Quantitative	Systematic review and meta-analysis applied methodology of searching five (5) electronic database for cohort studies across-sectional case-control. The articles that were published in the last five years were examined for their sustainability including articles that used participants of 18+ years old. Systematic review and meta-analysis of 11,621 references and 2,334 full-text articles were retrieved and screened, 194 were included with 37 selected for review, a total of 253,719 participants.	Results pointed out that individual with multiple ACEs is predisposed to major risk factors for several health conditions.	The review was done based on retrospective ACE reports that may be subjected to recall or biases. Genetic variation and environmental risks, for instance, parental smoking or drinking during pregnancy which has a significant relationship between ACEs and health were omitted.	Level II Grade B

#7	Barnes, A. J., Anthony, B. J., Karatekin, C., Lingras, K. A., Mercado, R., & Thompson, L. A. (2019).	Non-Research Qualitative	Systematic review. Overview of data on ACEs identification and preventive measures	Examine preventive approaches for ACEs to eliminate negative health associated. Minimal screening tools to allow for easier identification of ACEs in pediatric settings. Statistically significant	Inadequate screening	Level IV Grade B
#8	Zarse, E. M., Neff, M. R., Yoder, R., Hulvershorn, L., Chambers, J. E., & Chambers, R. A. (2019).	Research Qualitative	A qualitative review of a – 2-decade previous research to draw reviews of different authors using ACE questionnaires. An OVID/PubMed search was used. The review included a manual search of bibliographies, yielded 134 articles and 44 were the original ACE-Q study population.	Exposures of children to ACEs are associated with various interlinked mental illness, multiorgan medical diseases, and addictions. Results indicated that 50% of the ACEs identification approaches have been applied in clinical settings. Statistically significant	ACEs in children could not be relied upon in identifying fetal or genetic exposures.	Level III Grade A
#9	Koita, K., Long, D., Hessler, D., Benson, M., Dale, P., Bucci, M., & Harris, N. B. (2018).	Research Quantitative	The study applied ACE-Q in an urban pediatric care setting. The questionnaires were administered to 28 caregivers, among were 16 health providers N=58 n=28.	Bay Area Research Consortium on Toxic Stress and Health (BARC) development of pediatric screening tool necessitates the use of ACE-Q in pediatric primary care. Statistically significant	Small sample size. N=58 Caregivers were approached N=28 only enrolled	Level III Grade B
#10	World Health Organization. (2011)	Non-Research Descriptive	Simple descriptive analysis. Adverse Childhood Experiences International Questionnaire Pilot	To identify opportunities for validating ACEIQ and implementing it in broader health survey Significant	Phrasing and/or several questions were said to be problematic and too long.	Level IV Grade B

			study review and finalization meeting, Geneva			
#11	Shanta, D. R., Vincent, F. j., Maxia, D., Daniel, P. C., Wayne, H. G., & Robert, F. A. (2003).	Research A retrospective cohort study with quantitative analysis	Adults who attended primary care at [redacted] in San Diego, CA. A retrospective cohort study of 8613	Each ACE increased the likelihood of early initiation 2- to 4-folds. The ACE score had a strong graded relationship to initiation of drug use, drug addiction and parental drug use. Illicit drug use problem identified as 56%, 64%, and 67% respectively.	Respondents difficulty recalling certain events. The lower number of childhood exposures reported by older people in the study.	Level II Grade B
#12	Herzog, J. I., & Schmahl, C. (2018).	Research Qualitative, Non-Experimental, descriptive	Review of existing literature on the impact of ACE on neurobiology, mental and somatic health in adulthood	History of ACE exposure can result in complex clinical profiles with multiple co-occurring mental and somatic disorders in adulthood	More longitudinal studies are needed to better understand complex ACE-related characteristics and mechanisms associated with mental and somatic.	Level III Grade B
#13	Geddes, K., Dziurawiec, S., & Lee, C. W. (2013).	Research Quasi-Experiment	A pilot study of 6 adolescents attending a community mental health service received 26 weeks of dialectical behavioral therapy (DBT) program with their parents	Adolescents reported a decrease in trauma-based symptoms, suicidality and nonsuicidal self-injury (NSSI) after DBT with a 3 month follow up. Improved emotional regulation after treatment with DBT. Five to six were discharged following DBT intervention	Lack of control group and small sample. The potential impact on self-reporting measures	Level II Grade A

#14	Davis, L., Barnes, A. J., Gross, A. C., Ryder, J. R., & Shlafer, R. J. (2019).	Research A cross-sectional survey with secondary data analysis/multinomial logistic regression (Descriptive statistics)	Minnesota student survey, the state-wide survey of public-school students in 8th, 9th and 11th grades. (n = 105 759)	Adolescents with multiple ACEs were more likely to overweight, obese and severely obese to the general population with no ACEs. Adolescents who reported ACEs were 1.2, 1.4 and 1.5 times more likely to be overweight, obese and severely obese compared to those with non-ACEs.	Primary variables (ACEs and weight status) were likely underestimated, self-report may underestimate the proportion of youth with overweight and obesity. Study missing some types of ACEs like parental separation/divorce or parental mental illness which underrepresented the actual prevalence of adversities.	Level II Grade B
#15	Baglivio, M. T., Wolff, K. T., Epps, N., & Nelson, P. (2017).	Research Quasi-Experimental. Descriptive statistics and bivariate correlation	The juvenile offenders in Florida Department of Juvenile Justice (FDJJ) who turned 18 between January 1, 2007, and December 31, 2012. (*N* = 64,329) (n = 59,342)	The study examined the effects of concentrated disadvantage and affluence on the ACE scores of high-risk juvenile offenders. Findings have shown disadvantage and affluence significantly associated with ACEs score.	All juvenile offenders were included in the study. The temporal order of ACEs score.	Level II Grade B
#16	Felitti et al., (1998).	Research Qualitative survey with logistic regression	A questionnaire about ACEs was mailed to 13, 494 adults who had completed a standardized medical	A strong graded relationship was found between the breadth of exposure to abuse or household dysfunction	Data were based on self-report, retrospective and only showed associations	Level III Grade B

			evaluation at a large HMO. 9,508 (70.5%) responded. [redacted]	during childhood and multiple risk factors leading causes of death in adults.	between childhood exposure and health risk behavior, health status and diseases in adulthood. Disease condition could be over-or under-reported by patients while completing the questionnaires. Childhood ACEs exposures include emotional sensitive discussion like family alcoholism that physicians may fear to address	
#17	Schickedanz, A., Halfon, N., Sastry, N., & Chung, N. (2018).	Research Non-Experimental Descriptive/Retrospective information	Retrospective information on 9 ACEs self-reported by parents and parent reports on their children about behavioral problem using the behavioral problems index (BPI), ADHD, and emotional disturbance diagnosis Data from 2014 Panel Study of Income Dynamics (PSID) 5,636 children aged 0-17	Children who parent-reported 4 or more history of ACEs had worse scores on the BPI and positive behavioral scale (PBS). Early childhood stresses have long-lasting downstream consequences from generation to generation. Children of parents with more ACEs highly susceptible to behavioral problems including ADHD.	The review was done based on retrospective information that may be subjected to recall or biases.	Level II Grade B

#18	Reichman, N. E., Corman, H., Noonan, K., & Jimenez, M. (2018).	Research Longitudinal cohort study	Data from the ongoing longitudinal Fragile Families and Child Wellbeing (FFCWB) birth cohort study. Parents of 4898 children born between 1998-2000 in 75 hospitals randomly sampled in 20 large U.S. cities while the mother was still in the hospital after birth. Mothers ≥ 18, English or Spanish speaking, father living, and child would not be adopted.	Strong links between disabling infant health conditions and ACEs at age 5. The study suggests the critical importance of supporting children and their families to promote optimal child development and address ACEs. Suggest roles of pediatricians and encourage and interact with families and interdisciplinary collaboration.	Unable to characterize the intensity or duration of ACEs.	Level III Grade B
#19	Alisic, E. (2012).	Research A qualitative design with semi-structured interviews analyzed with summative analysis.	A purposively varied sample of 21 elementary school teachers (ages 22-55 years; with 0.5-30 years of teaching experience; 5 men).	Teachers play important roles in children's recovery; psychological support of children exposed to trauma is highly significant.	The study focused on teachers' view, it was difficult to conclude teachers' behavior, unable to measure teachers' behavior in the classroom.	Level III Grade B
#20	Perez, N. M., Jennings, W. G., & Baglivio, M. T. (2018)	Research Qualitative	Study data from 64,329 Florida Department of Juvenile Justice youth. Collected from 2007-2012	A large proportion of the relationship between childhood adversity and serious, violent, and chronic (SVC) delinquency is mediated by maladaptive personality traits and behavioral problems	Data were compiled at the time of youth contact with FDJJ, unable to determine which behavior occurred during early childhood.	Level III Grade B

#21	Kalmakis, K. A., & Chandle , G. E. (2015).	Research Systematic review	Adult ≥ 18-year-old Out of 1565 articles on health outcomes related to ACEs, 42 were included in the synthesis	The results of the systematic review shows that ACEs is significantly associated with negative health outcome in adults. ACEs have been associated with physical and psychiatric health problems.	Majority of the measured ACEs based on self-reports subjected to bias and recall	Level III Grade B
#22	Catani, C., & Sossalla, I. M. (2015).	Research Qualitative Linear regression analysis.	(*N* = 56) (n = 55) Individuals attending a welfare care center for intellectual disabilities, age over 18.	Child maltreatment is a risk factor for further victimization and development of the mental problem in adulthood in the intellectual disabled population. Identified significant relationship between child abuse and adult mental health in individuals with intellectual disability (ID).	A small sample size and untested participants with IQ tests to validate the diagnosis of ID. Many were unwilling to participate in the study.	Level III Grade B
#23	Ports, K. A., Merrick, M. T., Stone, D. M., Wilkins, N. J., Reed, J., Ford, D. C. (2017).	Non-Research Qualitative review	Review of literature	ACEs are well-documented and risk factors for suicidality. ACEs are linking to increase suicide rate	Based on self-report	Level V Grade C
#24	Vervoort-Schel, J., Mercera, G., Wissink, I., Mink, P., van der Helm, P., Lindauer, R.,	Research Casefile study	Data from (N = 69) with intellectual disability (*n* = 46) male (*n* = 23) female Ages 2-16 years old discharged from [redacted]	The study revealed a high prevalence of ACEs from the original ACEs framework in children with ID as 82% with at least 1 original ACE. There is a strong association between ACEs	The sample size was relatively small for the number of characteristics understudied.	Level III Grade B

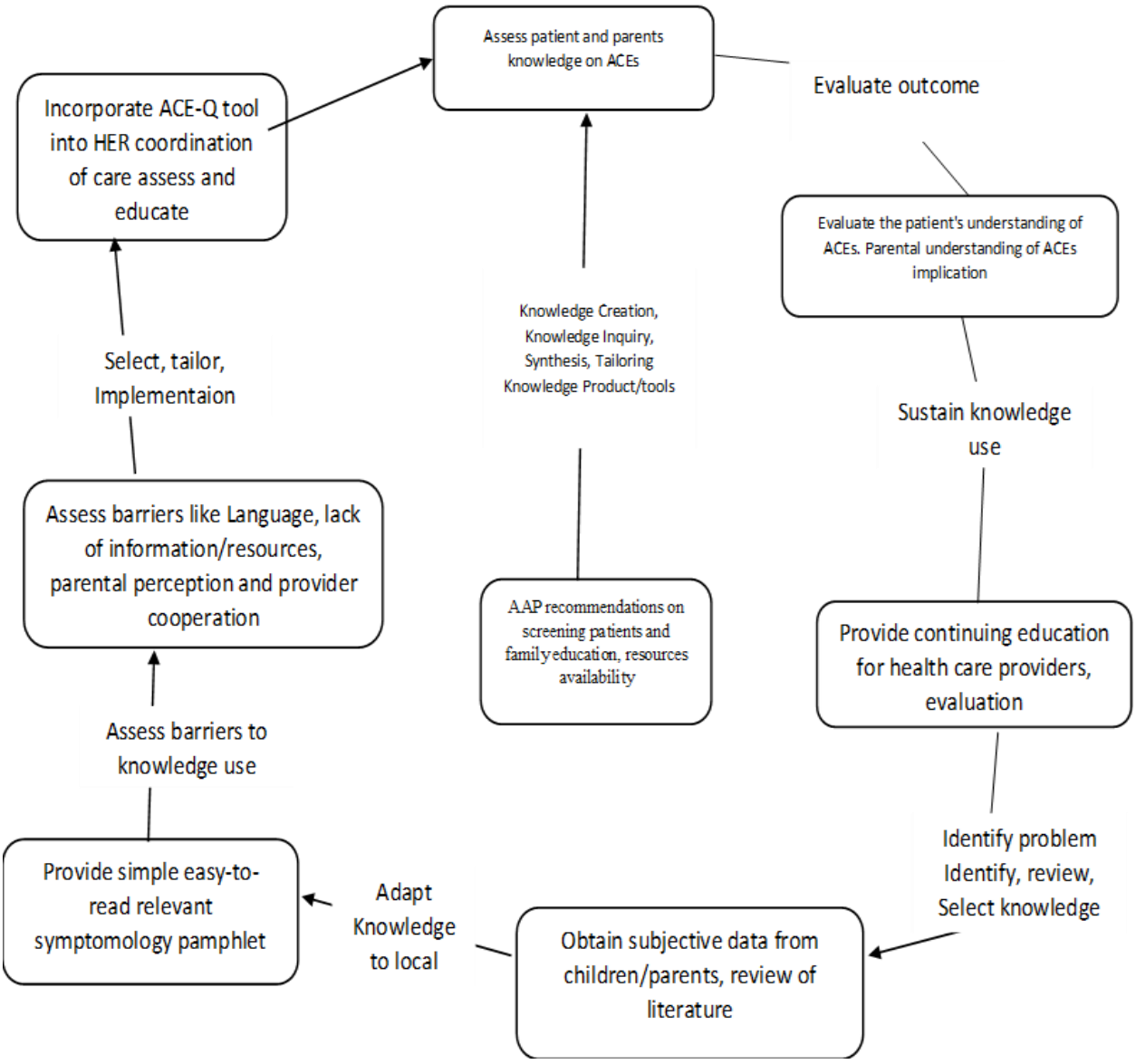
	& Moonen , X. (2018).		[redacted], The Netherlands.	and mental and physical health in children with ID.		
#25	Kerker, B. D., Zhang, J., Nadeem, E., Stein, R. E., Hurlburt, M.S.; Heneghan, A.; Landsverk, J.; & McCue Horwitz, S (2015)	Research Qualitative Survey	Data from the National Survey of Child and Adolescent Well-being (NSCAW) N = 5872 Between February 2008 and April 2009 Ages 0-17.5 years	Children in the child welfare system are susceptible to high rate of adverse experiences. ACEs may lead to early childhood mental health condition, chronic medical condition, and socio-developmental problems.	Some of the categorized ACEs were different from the original and did not capture all life events.	Level III Grade B
#26	Brown, J. D., King, M. A., & Wissow, L. S. (2017).	Research Qualitative Narrative review	Review of literature	Patient-provider relationship are vital to discuss and disclose sensitive issues related to ACEs. Patient-centered and psychotherapy suggest way to built the trusty relationship.	Based on the review and possible biases.	Level III Grade C
#27	Lange, B. C., Callinan, L. S., & Smith, M. V. (2019).	Research Quasi-Experiment	The New Haven Mental Health Outreach for Mothers (MOMS) N = 1985 (*n* = 81)	Statistically significant relationship between ACEs and parenting practices ($p<0.005$). A dose-response relationship between ACEs and the latter.	Secondary analysis of data originally not meant for ACEs on parenting. A small sample size. The study focused on a homogenous population of low-income, parenting mothers living in	Level II Grade B

					public housing, unable to generalize the result to other population.	
#28	Bethell, C. D., Carle, A., Hudziak, J., Gombojav, P., Powers, K., Wade, R., & Braveman, P. (2017).	Research Qualitative survey	Data from the 2011-2012 NSCH included 2016 Identified 14 distinct ACEs assessment tools for use in research, population surveillance and clinical practice.	12 of 14 identified ACEs assessment tools are recommended for use in conjunction with other questionnaires as part of a larger survey. 5 have been used in clinical settings (public, research.	No data on the temporal stability of the NSCH-ACEsneither any classic test-retest analyses for the measure	Level II Grade B
#29	Hunt, T. K., Slack, K. S., & Berger, L. M. (2016).	Research Retrospective review/ Longitudinal cohort study	Data from the Fragile Family and Child Wellbeing Study (FFCW) The longitudinal birth cohort of 4898 children born in large U.S. cities between 1998-2000.	Children as young as age 9 start showing behavioral problems after exposure to early childhood adversities.	Reliance on the retrospective report of ACEs which prone to recall and biases. Rarely provided sufficient controls confounding influence of ACEs.	Level III Grade B
#30	Zeanah, C. H., & Sonuga-Barke, E. J. (2016).	Research Longitudinal study	Retrospective	Both prospective and retrospective	Rely on retrospective report	Level III Grade C
#31	Lee Oh. D., Jerman, P., Purewal Boparai, S.K., Koita, K., Briner, S., Bucci, M. &	Research Systematic review	32 tools examined with adversity categories. Review methodology articles published between January 1, 2012, and December	Reliability and validity are often available for older versions of measures. CYW ACEs-Q most recommended standardized screening tool for pediatric use.	Self-report versus interview	Level III Grade B

	Harris, N.B. (2018).		31, 2016. Identified 32 measurement tools. Four of the selected measures were developed for children aged 10 years or younger.	Normal data is not of importance when the purpose of the measurement is to determine if a child is exposed to ACEs or not.		
#32	Steele, H., Bate, J., Steele, M., Dube, S. R., Danskin, K., Murphy, A. (2016).	Research Qualitative Survey	Exposures of ACEs among 118 mothers (n = 33) low social, economic status (SES) and (n = 85) middle/high SES and parenting distress. Clinical samples from Center for Babies, Toddlers and Families, Department of Pediatrics at [redacted], Bronx, NY.	Poverty and adversity during childhood were highly correlated. Childhood exposure to trauma and poverty predict higher parenting stress. ACEs exposure irrespective of ethnicity/race/financial status is a risk factor for parenting from generation to generation.	Lack of low SES nonclinical comparison group and did not examine individual personality of parent and children neither account ongoing exposures	Level III Grade B

Appendix D

D. Conceptual Framework



Adapted from: Graham, I., Logan, J., Harrison, M., Straus, S., Tetroe, J., & Robinson, N. (2006). Lost on knowledge translation: Time for a map? *Journal of Continuous Education in the Health Professions, 26*(1), 13-24.

Appendix E

E. Inclusion/Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
• Pediatricians (board-certified pediatrics or family medicine) or family nurse practitioners. • They must be currently practicing in the outpatient pediatric primary care clinic in [redacted]	Any part-time providers will not be included

Appendix F

F. Recruitment Flyer

Screening of Adverse Childhood Experiences (ACEs) in a Pediatric Primary Care Settings

Purpose of the Study:

To implement Adverse Childhood Experiences (ACEs) screening tool in a pediatric primary care setting for early detection of toxic stress and appropriate care

Eligibility:

Pediatricians, Family Medicine Providers, Nurse practitioners working full-time in the study site

Study Activities:

(1) Attend a 1-hour educational session on ACEs and its screening tool
(2) Use ACEs screening tool for 8 weeks

Date/Time:

Mondays, Tuesdays, & Wednesdays of October and November 2020.

Study Site:

[redacted]

If you are interested in the study, please contact us at [redacted] or [redacted]

Principal Investigator: Kyeongra Yang, PhD, MPH, RN, CNE
Co-Investigator: Olubunmi Adetule, PMHNP, APN-C
Rutgers School of Nursing
Rutgers, The State University of New Jersey
65 Bergen Street
Newark, NJ 07101-1709

10/01/2020 Version 5

[redacted]

Appendix G

G. Questionnaire

RUTGERS School of Nursing

ID: _____

1. Did you attend ACE-Q training session?

1) Yes
2) No

1-A If you answer yes to the above question, when did you attend the session?

_____

*2. How frequently did you use ACE-Q with your clients during the week?

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Never	1	1	1	1	1	1	1	1
Rare	2	2	2	2	2	2	2	2
Sometimes	3	3	3	3	3	3	3	3
Often	4	4	4	4	4	4	4	4
Always	5	5	5	5	5	5	5	5

* This question will be asked every week for 8 weeks.

**3. Please provide your perception on using CWY ACEs-Q.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
I feel I have sufficient time to screen ACEs					
I feel comfortable in screening sensitive information					
I have more resources than barriers to use ACEs-Q					
I am satisfied with using ACEs-Q					
I am willing/ready to introduce ACEs-Q to other providers					

** These questions will be asked at the end of the project.

[redacted]

Appendix H

H. CYW ACEs-Questionnaire and Interpretation

CYW Adverse Childhood Experiences Questionnaire (ACE-Q) Child

To be completed by Parent/Caregiver

Today's Date: _____

Child's Name: _____ *Date of birth:* _____

Your Name: _____ *Relationship to Child:* _____

Many children experience stressful life events that can affect their health and wellbeing. The results from this questionnaire will assist your child's doctor in assessing their health and determining guidance. *Please read the statements below. Count the number of statements that apply to your child and write the total number in the box provided.*

Please DO NOT mark or indicate which specific statements apply to your child.

1) Of the statements in Section 1, HOW MANY apply to your child? Write the total number in the box. ☐

Section 1. *At any point since your child was born...*

- Your child's parents or guardians were separated or divorced
- Your child lived with a household member who served time in jail or prison
- Your child lived with a household member who was depressed, mentally ill or attempted suicide
- Your child saw or heard household members hurt or threaten to hurt each other
- A household member swore at, insulted, humiliated, or put down your child in a way that scared your child OR a household member acted in a way that made your child afraid that s/he might be physically hurt
- Someone touched your child's private parts or asked your child to touch their private parts in a sexual way
- More than once, your child went without food, clothing, a place to live, or had no one to protect her/him
- Someone pushed, grabbed, slapped or threw something at your child OR your child was hit so hard that your child was injured or had marks
- Your child lived with someone who had a problem with drinking or using drugs
- Your child often felt unsupported, unloved and/or unprotected

2) Of the statements in Section 2, HOW MANY apply to your child? Write the total number in the box. ☐

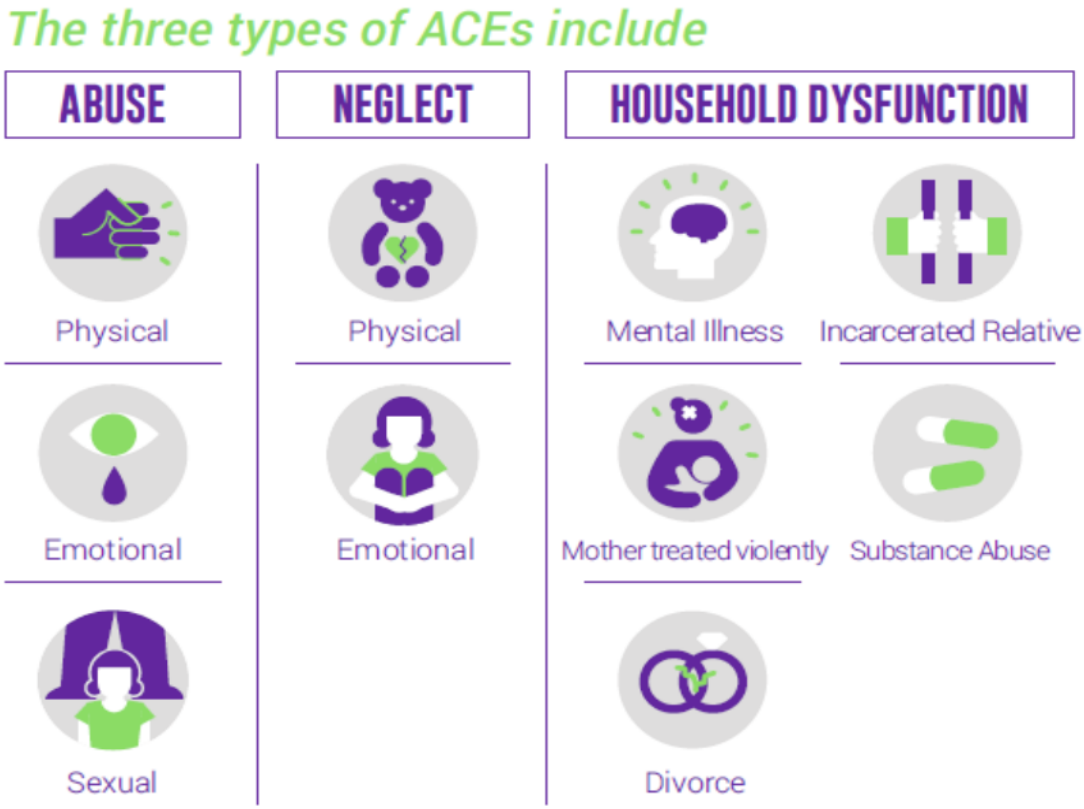
Section 2. *At any point since your child was born...*

- Your child was in foster care
- Your child experienced harassment or bullying at school
- Your child lived with a parent or guardian who died
- Your child was separated from her/his primary caregiver through deportation or immigration
- Your child had a serious medical procedure or life threatening illness
- Your child often saw or heard violence in the neighborhood or in her/his school neighborhood
- Your child was often treated badly because of race, sexual orientation, place of birth, disability or religion

Interpretation

Appendix I

I. ACEs Phamplet: Types and Relevant Symptomatology



Relevant Symptomatology:

Sleep disturbance
Weight Gain or loss
Failure to thrive
Enuresis, encopresis
Constipation
Hair loss High-risk behavior in adolescents
Poor control of chronic disease
Developmental regression
Interpersonal conflict
School failure or absenteeism
Aggression
Poor impulse control
Frequent crying
Restricted affect or numbing
Unexpected somatic complaints
Depression
Anxiety

Source: Center for Youth Wellness. (2015). ACE-Q User for Health Professional

Appendix J

J. Project Timeline

#	Project Activity	Date
1	Submission of DNP Project Proposal to DNP Team	December 2019
2	Presentation of DNP Project Proposal to DNP Team	February 2020
3	Approval of DNP Project Proposal by DNP Team for submission to IRB	February 2020
4	Submission of DNP Proposal to IRB	February 2020
5	Approval of the DNP Proposal by IRB	October 2020
6	Implementation of DNP Project	October – December 2020
7	Data analysis, result, and conclusion	January 2021
8	Final Presentation to DNP Team	January 2021
9	IRB request to close DNP Project and approval to close the project	January 2021

Appendix K

K. Project Budget and Cost

#	Description of Expenses	Project Cost
1	Printing of flyers/pamphlets, Observation forms, CYW ACEs-Q	$150.00
2	Printing of 36 x 60-inch poster for project presentation	$70.00
3	2 USB Storage	$35.00
4	Miscellaneous	$100
	Total budget cost	**$355.00**