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PLAY YOUR ACEs: CLINICAL PRACTICE CHANGE FOR ADVERSE CHILDHOOD EXPERIENCES

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PLAY YOUR ACEs: CLINICAL PRACTICE CHANGE FOR ADVERSE CHILDHOOD EXPERIENCES

An Abstract of the project by
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The study included an educational module provided to healthcare providers in order to evaluate whether an increase in knowledge occurred based on responses to questions specific to Adverse Childhood Experiences (ACEs). The study assessed the providers' baseline knowledge on ACEs based on pretest data. This study aims to evaluate if there was increased knowledge after review of educational materials. Following the educational module, a follow-up posttest survey was provided via web link to assess the providers' knowledge specific to this topic after receiving additional education. The study measured if providers lacked general awareness on ACEs, and if there was an increase in knowledge of ACEs after additional education was provided in hopes to determine if education may help providers identify ACEs and intervene as warranted. The education provided included risk factors of ACEs, definitions of ACES, how to identify, consequences of trauma, & intervention techniques that are recommended by the Centers for Disease Control and Prevention (CDC).

The target population was healthcare providers that care for children and were recruited from various provider groups, online and in person via word of mouth. A link to a pretest and posttest survey as well as educational modules were provided. Participation was purely voluntary and unique identifying information was not visible to the researcher. A pretest survey was given to participants followed by digital educational materials and concluded with a posttest survey. Once the surveys were complete, score

were analyzed.

A t-test was conducted on the pretest and posttest results by an external source. The study concluded with statistical significance ($p < 0.0001$) that the education provided increased providers' knowledge of current facts and recommendations on ACEs. All participants (n=41) had an increase in posttest scores after the education was provided. The findings of the study

indicated that many providers are not well versed on adverse childhood experiences, how to identify them, risk factors, consequences, and interventions specific this topic. Although information is readily available, providers and the children they care for can greatly benefit from additional education on ACEs. This study confirms the need for additional education for providers in adverse childhood experiences.

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Chapter I

Introduction

Adverse Childhood Experiences (ACEs) include any troubling/traumatic experience encountered during childhood. These experiences include physical abuse, sexual abuse, emotional abuse, neglect, substance use or abuse in the home, marital discord or divorce, domestic violence, mental illness in a close relative, incarceration of close relative, and many other dysfunctional and traumatizing events. So why are ACEs so important? In addition to these negative experiences affecting children during the time in which they occur, ACEs lead to many future consequences of health, development, behavior, and socioeconomical concern. These consequences not only affect children, they can persist or even present well into adulthood (Centers for Disease Control and Prevention [CDC], 2019).

In this chapter, there will be a review of what constitutes an adverse childhood experience and how this translates into both a societal and clinical problem. The significance of this problem is substantial; prevalence and consequences, as well as aims of the project in relation to the problem will be discussed. Additionally, this introductory chapter will introduce the theoretical framework used, key variables, questions and hypotheses of the project, a section to define key terms and a logic model.

Description of the Clinical Problem

Despite the major consequences that will impact society as a whole, many people are not aware of what ACEs are or what the consequences entail. Adverse childhood experiences (ACEs) include all types of traumatizing experiences during childhood including but not limited to physical, sexual & emotional abuse, neglect, and other household dysfunction. ACEs are important to both prevent and recognize not only because of the obvious risk of immediate harm, but also because they lead to increased diseases, poor quality of life, increased mortality, increased violence, poor socioeconomic status and much more.

Cognitive and behavioral changes may ensue as a result of trauma. Some risky behaviors that may be long term consequences of ACEs include increased likelihood of smoking, drug use, alcoholism, sedentary lifestyle, high risk sexual behaviors, and missed work. There are physical and mental health ailments that will result from these behaviors and from the trauma alone. Some of the known health consequences include increased risk of obesity, diabetes mellitus, heart disease, stroke, chronic obstructive pulmonary disease (COPD), cancer, broken bones or other physical trauma, sexually transmitted infections and diseases, anxiety, depression, increased substance abuse, and suicide attempts (CDC, 2019; Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016).

Significance

Unfortunately, ACEs are quite prevalent and are not always obvious, as it is believed the numbers are highly underestimated, under reported, and under investigated. At least 1 in 7 children have experienced one ACE in the just last year alone, and more than half of the population will have at least one ACE in their lifetime (Centers for

Disease Control and Prevention, 2019). For a child with even just one qualifying adverse childhood experience, there is up to a 95% chance that additional trauma will occur (Bethell, et al, 2017).

There are several factors that increase risk for child maltreatment. Some of these risk factors include: non-white race, poor socioeconomic status, younger child age, and child with chronic illness or disabilities. There are also some factors specific to parents that make them more likely to be a perpetrator to their children. Some of these risk factors include: caregiver mental illness and stress, having multiple children and being a single parent, young age of parent, personal history of being abused as a child or by intimate partner, poor support system, and financial hardship (Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016).

Adverse childhood experiences (ACEs) can lead to significant short term and long term consequences to many people directly involved or not. A lack of education on ACEs serves as a barrier to prevention, identification of risk, and hinders proper intervention. As mentioned, some of the long-term outcomes relates to experiencing ACEs will lead to significant health consequences and hardships (CDC, 2019). These consequences are not only going to affect those facing them directly, this will place demand and responsibility on the healthcare system and its professionals.

ACEs not only contribute to significant morbidity, but the rate of mortality is also increased by adversity. People that have had as few as six ACEs have been shown to have a shortened lifespan by an average of twenty years. Unfortunately ACEs are not all that uncommon; up to almost two-thirds of children experience at least one ACE (CDC, 2019). This is a common problem that has great consequences; practice change should be

in place to help reduce some of the burden.

This issue is especially significant to nursing for many reasons. According to the National League for Nursing, the core values of Nursing are caring, integrity, diversity, and excellence (2019). The first core value of caring means to improve health outcomes, facilitate healing and improve hope for others. When ACEs are both prevented and treated, nurses are living out this core value. If nurses can improve outcomes for those with ACEs they will be showing integrity by caring without limitation, making ethical decisions to intervene, and helping these people regain their dignity. Nurses should care for all diverse groups of people; no one is immune to experiencing adversity and nurses should work to help improve the outcomes for the greater good of all individuals.

Specific Aims

The purpose of this DNP scholarly project is first and foremost to increase awareness, and ultimately to lead in change for preventing and promptly treating children with adversity. The project component is designed to determine if delivering specialized education on ACEs to health care providers will lead to increase in awareness, improvement in identification of children at risk, and help facilitate further prevention strategies and interventions.

Theoretical Framework

Current insight on adverse childhood experiences, and the implications and ongoing impact that trauma can have on people is supported by The Modeling and Role Modeling Theory by Helen Erickson, Evelyn Tomlin and Mary Anne Swain. The theory encourages nurses to consider each patient and their individual situation and to provide tailored care and comfort based on the individual's stressors and needs. The theory

concludes that there are both generalized similarities and differences among all people. Knowing these similarities and differences, nurses can make assumptions on how ACEs may negatively impact those involved and be prepared to provide compassionate care and facilitate needed interventions for all. Nurses should seek out the differences in each individual in order to nurture and improve health among people (Petiprin, 2016).

There are multiple assumptions and theoretical statements within this theory. This theory assumes that the role of a nurse is to unconditionally accept others, facilitate patients' achievement of improved health, and provide comfort to others. It assumes that patients know what they need best, that nurses should promote patient's control over their health, encourage positive views of patient's selves, foster patients' strengths, build trust and help patients create attainable healthy goals. One of the assumptions that would apply most to children that have experienced trauma is the nurses need to build trust in order to provide care.

There are several additional statements applicable to this scholarly project, a major one being that in general, basic needs will drive human behavior. According to this theory, children at many developmental stages will innately be driven by basic needs and psychosocial stages, as well as cognitive stages by age should be considered, and will generally be similar amongst most children. The theory's assumption that people will experience similar behaviors to attachment and loss is also very relevant. Despite the similar behaviors, all individuals, including children, will respond and adapt to stressors differently.

The theory speculates that all children will view situations and the world differently, based on their perspective and past experiences. This generalization can largely be related

to children who have faced a lot of hardships. All future experiences and perspectives will be relative to each child past experiences. Unfortunately, perspectives will be vastly different for children that have experienced trauma. Any loss these children face due to adverse experiences or trauma, either real or perceived, will decrease their ability to adapt and cope with stressors which will increase their overall needs (Petiprin, 2016).

Project Questions

1. For people who work with children, will education on adverse childhood experiences, increase providers' overall knowledge in effort to decrease consequences?
2. Will increasing education and awareness about ACEs allow health care providers to better identify children at risk?
3. Will increasing education and awareness about ACEs promote proper intervention and referral?
4. Will increasing education and awareness on adversity help providers identify common sequelae associated with ACEs?

Definition of Key Terms

- Child maltreatment- any form of treating a child poorly or bestowing adversity upon them including acts of physical abuse, sexual abuse, psychological, abuse, or neglect (Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016).
- Physical abuse- any form of excessive physical force or induction of physical harm upon a child (Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016).
- Sexual abuse- the act of performing any sexual behaviors upon a child for coercing them to perform any sexual behaviors or sexually exploiting them

(Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016).

- Psychological abuse- any outward behaviors or lack there of that impact a child's emotional and psychological well-being (Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016).
- Neglect- the failure to provide for or to act on anything relating to a child's basic needs, care, or safety (Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016).
- Child- person who is under 18 and not an emancipated minor (Children's Bureau, 2019).

Logic Model

Table 1. Logic Model

Name of Project:
PLAY YOUR ACEs: CLINICAL PRACTICE CHANGE FOR ADVERSE CHILDHOOD EXPERIENCES

Problem:
Adverse childhood experiences (ACEs) can lead to significant short term and long-term consequences of physical and mental health, damaging behaviors, and socioeconomical impact.

Situation:
Many healthcare professionals may be unaware of what constitutes an ACE and the serious implications they have on their patients and society as a whole. Increasing awareness may influence expansion of practice to include more consistent screening for ACEs and result in appropriate intervention and better outcomes.

Inputs	**Outputs**		**Outcomes**		
	Activities	**Participants**	**Short term**	**Mid term**	**Long term**

Human resources: Provider and clinical staff Office supplies: Paper or computer for hard or electronic educational material and the pre- and post-tests. Field resources: Access to primary care clinics that see children. Myself as the researcher.	Educational material placement Pre-test and post-test Incentive for participation	Primary care providers working with children.	Providers accept and utilize the educational resources that are provided.	Providers and clinical staff screen patients who present to the office for ACEs or risk factors.	Prevention strategies and increased and prompt intervention for those at risk of consequences of adversity.

Assumptions	**External Factors**
1. Provider participation is successful enough to implement the project and have sufficient data. 2. Administration of the clinics allow for screening tool to be utilized in the office. 3. Provider and clinical staff have a knowledge deficit in regards to ACEs and care to make change. 4. Patients and their caregivers will answer questions honestly.	1. The clinics are busy and there are already many measures that must be met at each visit. 2. Clinic administration allowing screening tool to be used at visits in the future. 3. Unpredicted barriers that may arise from the patient and caregivers.

Evaluation Plan:

Provider post-test of increased knowledge about ACEs and the associated consequences. The evaluation will look at if the learners will be willing to screen and able to recognize and intervene appropriately when needed.

Summary

ACEs have a significant impact on both local communities, and society as a whole. Dire mental and physical consequences exist because of adversities that individuals face as children. The consequences of ACEs impact children immediately after, as well as far into adulthood. Generations after them can be impacted as well. There is an unfortunate cycle of abuse, those who were abused as children are at increased risk of becoming perpetrators themselves (Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016).

Many ACEs are underreported and proper intervention is never achieved (liming & Grube, 2018). A routine screening for all children during office visits may be helpful in identifying children at risk. Community based efforts should be made to prevent, identify, and intervene for children facing adversity. Now is the time to break the cycle and improve outcomes for many individuals in the present, and for many generations in the future.

Chapter II

Literature Review

Overview

An in-depth search and review of the literature was performed to obtain current and relevant resources on adverse childhood experiences in relation to health outcomes. The search and review were performed using online search databases and select organizational websites. A substantial amount of research on ACEs and their associated outcomes has been previously conducted. The available literature discovered during this review has proven the need for practice change regarding ACEs and the need for increased education, screening, prevention and treatment for childhood adversity.

Several databases were used in the search, these include Pittsburg State University's summon, Science Direct, PubMed, CINAHL, and the CDC website. The keywords used for the search were: "ACEs", "adversity", "adverse childhood experiences", "childhood adversity", "child abuse", "child neglect", "childhood trauma", "pediatric adverse experiences", "screening for adversity", and "screening for ACEs". There were 406 articles that turned up after the initial search. These articles were further filtered with automated selections; this decreased the relevant sources to 88. Furthermore, additional hand selection from the remaining articles was performed. The criteria used to filter the results include:

- Articles published within the last 10 years
- Information from reputable, organizational or government websites
- Peer reviewed scholarly articles
- Articles involving children
- Articles including the topic of childhood adversity or adverse childhood experiences
- Articled with full text available
- Articles in English

Practice Change Guidelines

Selection and appraisal of Best Practice Guidelines

Due to the nature of the need for the practice change, finding best available evidence is vital. The identification, prevention, and intervention for ACEs can involve many disciplines. The ideal solution to tackling ACEs will include clinical practice change in multiple areas of expertise. Best practice guidelines suggest screening for ACEs in the clinical setting in order to recognize the need for intervention and prevent further incidences. This project should enhance providers' ability to screen, recognize risk, and confidently intervene.

What is known from the evidence is that children need to be screened for adversity. What isn't fully known, is how to get providers to the point of easily recognizing risk and feeling confident in knowing when to intervene. The practice guidelines reviewed highly support screening for ACEs and providing multidisciplinary support when risk is identified. There are few guidelines to help guide providers in

facilitating this action and little research is available regarding whether or not providing specific education will improve these measures.

The evidence collected in the literature review supports the educational tool to be used by providers in hopes to improve screenings and overall outcomes. The tool that helps support the need for further education on ACEs for healthcare providers includes evidence-based practice, policy statements, and expert opinions. This scholarly project will utilize evidence to create an educational tool and then assess whether or not that educational tool will improve providers' likelihood to screen children for ACEs in the clinical setting.

The literature review found many supporting scholarly publications but few actual clinical guidelines. Experts suggest both prevention and treatment in the primary care setting by screening children during all well child visits. They also designate primary care as a very important place for intervention by way of referrals and other support measures (Hughes et al., 2017). Another peer-reviewed journal article gives primary care the role of preventing current harm and further risk by screening for and recognizing risk in the clinic setting. The authors also conclude that after patients are screened in primary care, these providers should provide treatment and referrals (Jorm &Mulder, 2018).

From the literature search performed, one of the most in depth clinical practice guidelines found is a technical package created by the CDC titled *Preventing Child Abuse and Neglect: A Technical Package for Policy, Norm, and Programmatic Activities*. The guide serves as a resource for multiple professions and uses multiple resources containing best evidence to provide strategies to reduce risks and poor outcome in communities

(Fortson et al., 2016). The AGREE II instrument was utilized critically appraises the CDC's clinical practice technical package. This AGREE II evaluation identified the CDC's technical packet guideline's quality of evidence as high and strength of recommendations as strong (AGREE Next Steps Consortium, 2013). The guide *Preventing Child Abuse and Neglect: A Technical Package for Policy, Norm, and Programmatic Activities* discusses thirty-two different practice change recommendations for various entities.

Practice change recommendations for implementation

In the CDC's technical package, there is an entire section dedicated to recommendations for the primary care setting. In addition to the primary care section, there are several recommended changes in the bundle that would be out of reach for someone working in a primary care clinical setting. One of the key recommendations that the screening would be best implemented from a primary care perspective is utilizing a screening tool for early recognition and intervention during visits in the primary care office. One of their recommended screening tools is the Safe Environment for Every Kid (SEEK) parent questionnaire and model (Fortson et al., 2016).

Additionally, the CDC has recommended in this clinical guideline package that primary care providers intervene after they have screened and recognized children at risk. Some of the interventions the guideline recommends include: Placing referrals to appropriate counseling/therapy*)*, providing referrals to home based programs, placing referrals and facilitating admission to childhood education programs available locally, and referring parents to available community resources (Fortson et al., 2016).

As mentioned, there are thirty-two different practice change recommendations from the CDC's technical package inclusive of various disciplines, many of which are not relevant to primary care practice. The bundle of recommendations that the would be best implemented from a primary care perspective are:

1. Utilize the Safe Environment for Every Kid (SEEK) parent questionnaire and model for early recognition and intervention during visits in the primary care office.

2. Place referrals to appropriate trauma based counselors that can perform *Trauma-Focused Cognitive Behavioral Therapy (TF-CBT), Multi-systemic Therapy (MST)* & *Parent-Child Interaction Therapy (PCIT).*

3. Provide referrals to home visitation programs such as The *Nurse Family Partnership.*

4. Place referrals and facilitating admission to childhood education programs available locally.

5. Refer parents to available training programs within the community such as ACT and *The Incredible Years* and *SafeCare* programs (Fortson et al., 2016).

The practice bundle starts with the recommendation most relevant to this scholarly project, utilization of the SEEK model to screen for risk factors, recognize risks, and then appropriately intervening. One of the most detrimental components of the bundle is the use of the SEEK model in the primary care setting to recognize abuse risks and any actual abuse situations and then provide prompt and appropriate treatments and

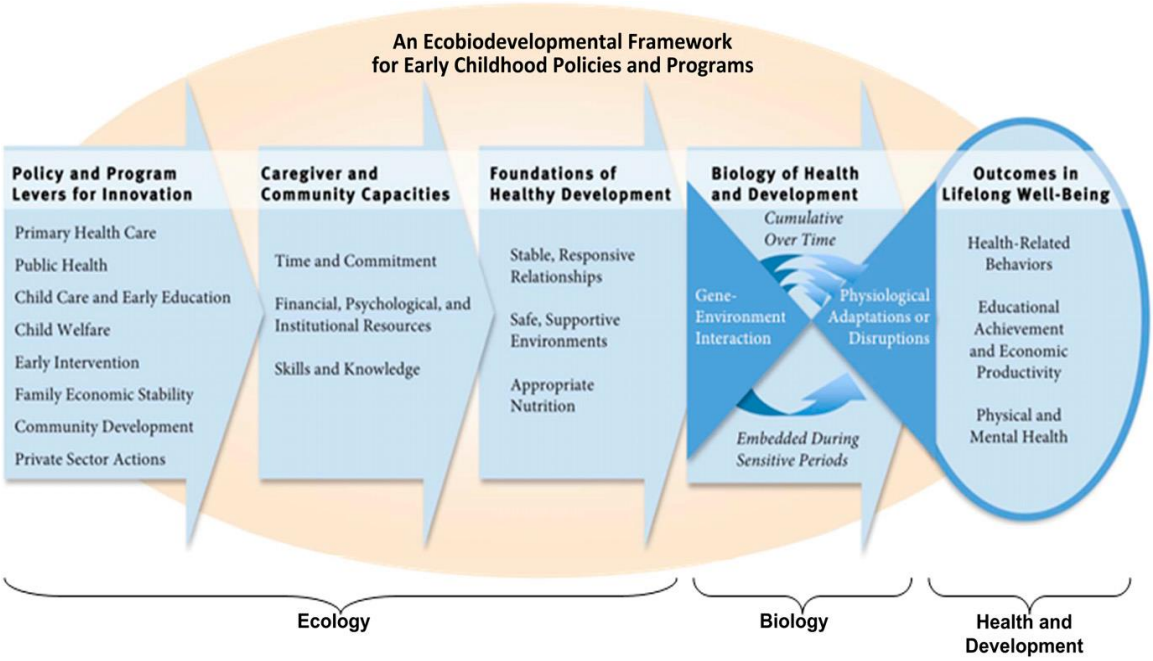
referrals. Recognition is key to provide intervention. The primary care medical home should screen all children and families, recognize risk, and facilitate treatment and services from other disciplines. This project will evaluate if additional education can make providers feel more apt to performing this recommendation.

Evidence for practice

According to another very strong source, a policy statement by the American Academy of Pediatrics (AAP), their recommendations are strong for routine screening of ACEs in the clinic setting. The policy statement specifically encourages providing anticipatory guidance for prevention and appropriate intervention and use of resources in addition to screening for adversity in the pediatric primary care medical home. It is clear from the reviewed literature that screening should be performed, but focus must now be made on how to best support providers in doing so. The AAP declares that there needs to be increased education for future and current medical providers to improve awareness and screening rates (Garner et. al, 2011).

The AAP policy statement supports the DNP scholarly project intervention of providing education to pediatric medical providers. They declare that it is the duty of pediatric providers to recognize, document, and treat suspected abuse. Research has provided evidence that adversity has life long and often significant consequences. This information proves the need for better strategy in the pediatric healthcare environment. The literature shows that a child's environment and incidences of adversity can alter actual brain development. The altered brain function will alter learning ability, behaviors and overall health for an entire lifetime (Garner & Shonkoff, 2012). As seen below, a framework, called the ecobiodevelopmental framework found in the reviewed literature,

helps demonstrate development in relation to health and disease and provides support for taking action at the primary care level.



Note. Ecobiodevelopmental Framework. Adapted from "Technical Report: Early Childhood Adversity and Toxic Stress" by Garner & Shonkoff, 2012, *Pediatrics*, 2011;129(1): e224–e231. (https://doi.org/110.1542/peds.2011-2662).

Evidence derived from review of literature of multiple strong sources, supports screening in the primary care setting. Providers should be trained and educated on proper screening for best outcomes. Based on information gathered during a systematic review of 42 articles by Kalmakis & Chander, it is pressing that throughout office visits and the screening process, staff should be able to recognize risks and confidently ask about ACEs. Careful wording and open-ended dialogue should be used in a non-judgmental

manner, and patients and caregivers should feel they are in a neutral, safe place to discuss risks during the ACE screening (2014).

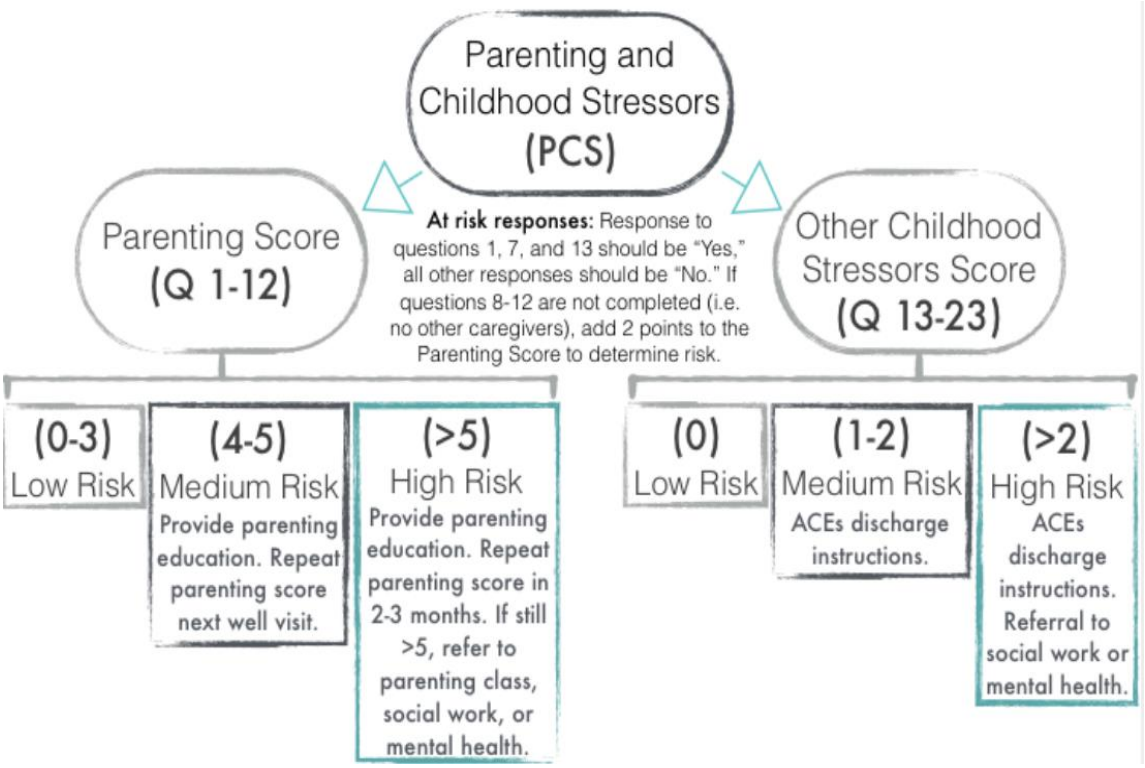
Screening Tool

Based on review of the literature, the recommended ACE screening tool to educate providers on using, is the SEEK questionnaire. The SEEK parent questionnaire is to be used to screen for various common psychosocial problems that increase risk to childhood adversity. The screen is designed to be answered by parents during well visits in the primary care office. The questions ask parents a wide range of questions form general safety, environmental exposures, parental depression and substance abuse, financial security, punishment, household violence, and more (University of Maryland School of Medicine, 2019).

It is suggested to build a relationship with the family and not screen on the first visit. Experts also suggest doing routine periodic screening at certain intervals, as there may have been changes in the household. The SEEK questionnaire contains 16 questions in "yes or no" format, is easy to read and understand, and available in multiple languages. The questionnaire should only be administered on a voluntary basis, and shared information should always be kept confidential with the exception of child harm (University of Maryland School of Medicine, 2019).

The questionnaire is scored in 2 segments; one based on parental stressors/parenting, and the other based childhood stressors. Positive scores of >5 in the parental segment, and >2 in the child segment, are high-risk and should receive immediate intervention. Some of the questions will automatically result in a positive

screen if answered yes. These questions include any food security question, presence of hard punishment, if the child is received as difficult or causing extreme stress to the parent or leaving them feeling like they need help, parental depression, intimate partner violence, or substance abuse (University of Maryland School of Medicine, 2019).



(Vanderbilt University Medical Center, 2018).

Provider Barriers

The barrier to providing screening that this project will aim to fix is lack of provider education and awareness, to ACEs and their consequences. Lack of time during office visit is also another expected barrier. Experts recommend providing the screening sometime before the visit, such as having the front desk staff or medical assistant hand the screening on a piece of paper a for them to fill out before the provider comes in for

the visit (University of Maryland School of Medicine, 2019). Additional foreseen barriers include potential lack of support from admin, office staff not performing this due to having little time and too many other tasks to complete, poor cooperation from parents and patients, poor confidence from staff or them not feeling comfortable discussing this sensitive and personal information, and lack of office or community resources.

Summary

The search of electronic databases resulted in several strong resources regarding childhood adversity. The review of the literature supports the need for change for many reasons. ACEs are prevalent and lead to many long-term negative consequences. There are resources available to improve outcomes for children with adversity and to help prevent further trauma. A screening tool has been designed specifically to determine risk in children during their primary care office visits.

Evidence reveals that screening should be performed to improve outcomes. In the review of the literature, the evidence does not have strong studies determining if better educating providers on ACEs will improve screening rates. However, there is support from experts and well established organizations that state there needs to be increased education in schools for new providers and additional supplemental education for current providers on the severe impact from ACEs, how to recognize risk factors, and when to intervene.

Chapter III

Methods

This chapter will review the details of the DNP scholarly project. The contents of this chapter will include the design of the research study, including details about the project, the sample population, how they were accessed and recruited, inclusion & exclusion criteria, and the ethical implications. Tools used, data collection, analysis methods, evaluation of outcomes and any additional procedures of this DNP scholarly project will also be discussed.

Project Design

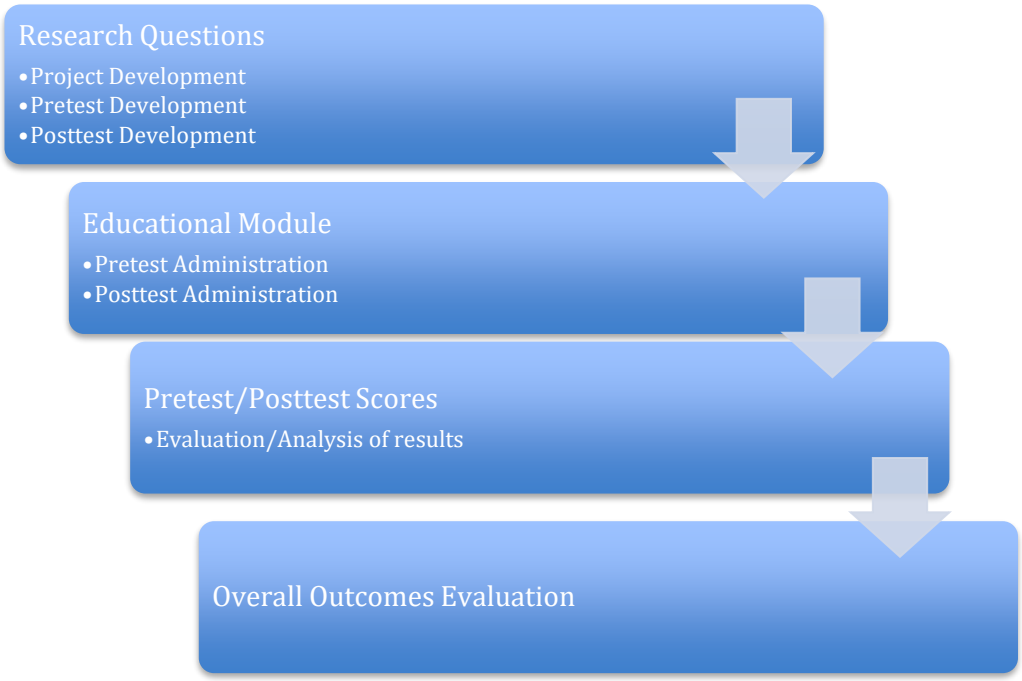
The project was designed in a way to minimize risk to participants, keep risk to others low, to keep cost and materials needed to a minimum, all while still being able to determine benefit of implementation. A two-part evaluation was used to determine if healthcare providers will benefit from education regarding adverse childhood experiences, with the goal of providers demonstrating increased awareness, confidence, and ability to recognize and intervene for children at risk of adversity. This project used quantitative data based on factual information learned from the education module as well as qualitative data obtained from surveys about how the participants feel about information learned and their confidence in utilizing this information.

The project design chosen for this problem was a quasi-experimental, pretest-

posttest design. Healthcare providers working in primary care who take care of the pediatric population were given a pretest on their knowledge of ACEs, their ability to recognize them, and current practices regarding screening and intervention. An educational resource on ACEs was provided to these healthcare providers. After the educational resource was completed, the providers were given a posttest with the same quantitative questions and additional qualitative questions to determine if their knowledge and ability to both recognize ACEs and provide intervention has increased. All data, both qualitative and quantitative, was gathered via pretest and posttest. The pretest/posttest design was appropriate for determining if this type of intervention has made an impact. The study design is presented below in Figure 3.

Figure 3.

Study Design



The study focused on the following research questions:

5. For people who work with children, will education on adverse childhood experiences, increase providers' overall knowledge?
6. Will increasing education and awareness about ACEs allow health care providers to better identify children at risk?
7. Will increasing education and awareness about ACEs promote proper intervention and referral?
8. Will increasing education and awareness on adversity help providers identify common sequelae associated with ACEs?

The pretest-posttest design was very feasible. It only required minimal external resources or researchers. A small amount of supplies was needed to create the tests and the educational module, but the material was presented in either electronic or hardcopy format, neither of which was very complex nor expensive. The approach, as used with a one-group design, was very ethical and participant friendly; the educational module was not withheld from anyone who wished to view the information.

Participants

For the study, the sample population or participants included licensed healthcare providers that take care of the pediatric population in any clinical care setting. The participants included those employed at any office or healthcare system as long as they provide care for children to some degree in any variety of medicine practice. Any type of physician or advanced practice clinician was eligible to participate. The participants voluntarily agreed to participate in the pretest, educational module, and posttest. Providers that work with children on a regular basis were chosen because they would benefit most from the intervention and may be able to carry this on to daily practice and share the information with other individuals who also work with children.

Participant Recruitment

The target population was recruited from multiple outlets. Individuals within the researcher's local professional network that are actively working with children in the primary care setting were utilized. In addition to these local peers, participants were recruited from National Association of Pediatric Nurse Practitioners via online forum in which the author is an active member, the Pediatric Nurse Practitioners online group, and the 4-State APN group. Participation was all voluntary, and the researcher did not offer

any compensation to participants in order to encourage people to volunteer and participate.

Inclusion & Exclusion Criteria

Inclusion criteria for participation in the pretest/posttest evaluation included all primary care, acute care, and specialty providers who regularly care for children, including those in hospital settings and outpatient clinics. Disciplines included in the study included doctors, nurse practitioners, and physician assistants, and licensed student. The type of licensure such as MD, DO, FNP, PNP or PA did not matter, nor did specific certifying board. However, only those with active licenses were included. Exclusion criteria will be unlicensed students, retirees without active licenses, and those that do not work with children. All participants were be above the age of 18 and no children were directly involved in this study.

Protection of Human Subjects & Ethical consideration

Potential ethical considerations have been made for the DNP scholarly project. Ethical aspects were carefully considered as this project involves the topic of children. Considerations have been made to minimize any ethical issues. Some of these considerations included not directly utilizing children or any other vulnerable populations in the project, utilizing a design that did not withhold a beneficial intervention from anyone, and carefully reviewing the project to ensure that the research did no harm and was fair. This project falls under exempt category and adheres to the Pittsburg State University human subjects and departmental guidelines.

Ensuring the pretest and posttest surveys were anonymous allowed exemption from the IRB review. All information gathered has been kept confidential and will not

place any participant at risk of liability or judgment. A survey where participants are not identifiable fits under exempt category (Terry, 2018). Research at an outside institution did not take place for this particular scholarly project. In addition to the educational module, Pretests and posttests were all issued online only to volunteers and was not something that had to be completed in participant's workplaces. All tests continue to be kept in a secure password protected electronic folder only accessible by the primary investigator.

Instruments

This project utilized an electronic survey via online platform to collect quantitative data via pretest/posttest format for descriptive study of the aforementioned research questions. The instrument included a pretest with 6 demographic questions and 15 questions including multiple choice questions, true/false questions, as well as short answer questions. The posttest included the same 15 questions and formats on the DNP scholarly project topic of adverse childhood experiences.

According to evidence, the Safe Environment for Every Kid (SEEK) parent questionnaire and model screening tool has been vetted as an appropriate tool for screening of children for ACEs. The SEEK model is a recommended tool to be used by clinicians in the primary care setting to screen for risk factors, recognize risks, and then intervene as needed based on results (Fortson et al., 2016). The SEEK questionnaire for parents is comprised of 16 "yes or no" questions. This tool asks sensitive questions about various psychosocial problems that could place a child at risk for maltreatment, lead to poor health or developmental outcomes, and negatively impact the safety of their child (University of Maryland School of Medicine, 2019).

Content Validity

Thorough evaluation of the project's survey content was performed based on high level evidence from the literature review to determine if the survey questions would properly discern providers' knowledge on ACEs prior to and after the educational module. The literature review indicated the importance of screening in primary care and educating healthcare providers to provide the screening and recognize ACEs. Each quantitative question asked was based on facts obtained from evidence and practice guidelines.

Operational Definitions

The operational definitions for each variable in the project are specified in this chapter to illustrate what is being evaluated in this project. The operational definitions for this particular project are as follows:

1. Adversity- "difficulty; misfortune" (New Oxford American Dictionary, n.d).
2. Experiences- events or occurrences that leaves an impression or affect (New Oxford American Dictionary, n.d).
3. Knowledge- information or fact base acquired by an individual (New Oxford American Dictionary, n.d).
4. Perceive/perception- to become aware of something; understanding, interpretation or outlook (New Oxford American Dictionary, n.d).
5. Accuracy- the degree that an outcome measured is correct (New Oxford American Dictionary, n.d).

Procedure

After being informed of the rules and risks of the project, volunteers participated

in an online pretest survey. After the survey, the participants were then asked to view an educational module provided electronically. Following the educational assignment, the participants were then asked take a posttest that contained the same questions as the pretest. They were instructed to answer all questions honestly, and to the best of their ability without any external aids. Prior to the pretest, the participants were asked to fill out demographic information to verify they meet inclusion criteria. All participants were given information regarding the project and were asked to provide consent to participate prior to beginning.

Data collection

Demographic data of the participants were collected from the pretest to ensure inclusion/exclusion criteria are met. Data from the project from the electronic pretest and posttests were collected by the primary investigator. The data has been secured online and is only available to the primary investigator. The electronic data will be deleted upon the researcher's completion of the DNP project and the program in its entirety.

Once collected, data analysis was performed by placing all data in a Microsoft Excel worksheet and performing a statistical analysis using a t-test. The t-test was performed on the pretest and posttest results separately. The pretest results and the posttest results were then compared to conclude if the educational module improved providers' knowledge on adverse childhood experiences.

Outcome Data

Outcome data has been determined based upon the results of the pretest and posttest scores. The outcomes have been based on the original research questions:

1. For people who work with children, will education on adverse childhood experiences, increase providers' overall knowledge?
2. Will increasing education and awareness about ACEs allow health care providers to better identify children at risk?
3. Will increasing education and awareness about ACEs promote proper intervention and referral?
4. Will increasing education and awareness on adversity help providers identify common sequelae associated with ACEs?

Outcomes

Evaluation Measures Linked to Objectives

Outcome measures have been appropriately corresponded to the objectives previously stated and displayed in the logic model (Table 1). The evaluation of the study intervention has been based on the pretest and posttest scores surrounding the intervention of the educational module. The outcomes that have been evaluated include: accurately defining what ACEs are, increased knowledge of the screening tool, accurately identifying risk factors and children at elevated risk, appropriate interventions, appropriate referrals, and overall demonstrated increase in knowledge surrounding childhood adversity.

Outcomes have been evaluated by statistical analysis of the data collected from the pretest and posttest. Improved outcome measures have been determined by an increase in correct answers on the posttest from the pretest after the education was completed. This data was externally analyzed by a statistician. An increase in recognition of ACEs and risk, increase in knowledge of interventions available and when they are to

be utilized, increased understanding of screening and guidelines, and increased overall scores are all indicators that the educational module was effective and that overall outcomes will be improved. Short-term outcomes are increased education and knowledge of providers, and medium-term outcomes would be improved screening, increased ability to recognize ACEs, and increased confidence in facilitating intervention. Long-term outcomes are beyond the scope of this project, but include overall improved outcomes for children at risk or facing adversity.

Tools linked to Measures and objectives

The tool that was linked to measures and objectives is a pretest and posttest that contains questions gathering both quantitative data in order to answer the research questions. The instrument included the pretest with 6 demographic questions and 15 ACEs related questions as well as the posttest with the same 15 ACEs related questions that have surround the educational tool. This was a survey tool designed to specifically cater to the research questions and objective of this DNP scholarly project. The test contained a variety of questions that included multiple choice, true/false, and short answer fill in the blank questions. The questions were used to predominately collect quantitative data. As displayed, in Table 2, the intent of all questions used were explicitly be to evaluate the objectives and intended outcomes of this project.

Table 2.

Objectives, Measurements and Outcomes

Objective	Measurement	Outcome	Analysis
Participants will correctly define adverse childhood experiences.	Participants will have an increase in correct response regarding defining adverse childhood experiences.	Participants were able to correctly define adverse childhood experiences.	t-test pretest/posttest format.
Participants will correctly identify children at risk/risk factors.	Participants will have an increase in correct responses regarding identifying risk factors and children at risk.	Participants were able to appropriately identify the various risk factors for ACEs.	t-test pretest/posttest format.
Participants will correctly identify proper intervention and referral choices.	Participants will have an increase in correct responses regarding identifying proper intervention and referral choices.	Participants were able to recognize the different treatment and prevention options relative to risk.	t-test pretest/posttest format.
Participants will identify common sequelae associated with ACEs.	Participants will have an increase in correct responses regarding identifying common sequelae associated with ACEs.	Participants were able to recognize the different sequelae that can result from ACEs.	t-test pretest/posttest format.

Methods of Analysis for Measurement

The questions from each pretest and posttest survey will be given equal points and calculated. All data gathered will be placed in an Excel worksheet in an organized manner. Statistical analysis will be performed on the results of the survey comparison using a t-test. The acceptable probability that will be needed to prove statistical significance for the results will be $p<0.05$. This will show that there is a probability of 95% that the outcomes were met due to the intervention of the educational module and not due simply to luck or chance.

Plan for Sustainability

Sustainability of continuing this intervention is very feasible. There is little financial burden. Education can be part of orientation, added to school curriculums, become part of annual competencies, or be offered as a CME opportunity by pediatric organizations. There will be the need for appropriate planning, organization, and individuals or groups to continue to push for and provide the education to students and providers. There is no foreseeable political conflict in sustainability.

Summary

The consequences of adverse childhood experiences impact children during childhood as well as long into adulthood. Children should be screened to evaluate for risk factors related to adversity (Fortson et al., 2016). An educational module may be beneficial in increasing providers' knowledge and comfort level in screening for and providing intervention for these children. This project will include providing qualified participants with a pretest to evaluate current knowledge on adverse childhood experiences, an educational tool, and a posttest to evaluate knowledge gained from the

educational tool. Chapter IV will discuss the results of the study.

Chapter IV

Introduction

The data in this study was collected to determine whether an increase in knowledge and accuracy would occur when providers were given education on the current evidenced-based clinical practice guidelines on adverse childhood experiences. The sample included 41 medical professionals who regularly care for children in practice. All participants were those who voluntarily participated in a pretest and posttest survey and were willing to volunteer their time to review educational resources that were provided to them. The data collected was based assessing if knowledge and awareness improved after the educational material was reviewed. The participants were initially given a pretest with demographical questions and evidence-based clinical practice questions. After the pretest, the education was reviewed by the participants, then followed up with posttest questions identical to the pretest with the exception of the demographical questions to determine if there was knowledge gained based on the comparison of the two tests. Each test administered the same 15 clinical questions with a total possible cumulative score of 15. The pretest contained a total of 21 questions, with 6 of those being demographic questions. The remaining 15 questions of both the pretest and posttest were directly in regard to evidence based clinical knowledge on adverse childhood experiences in relation to clinical practice.

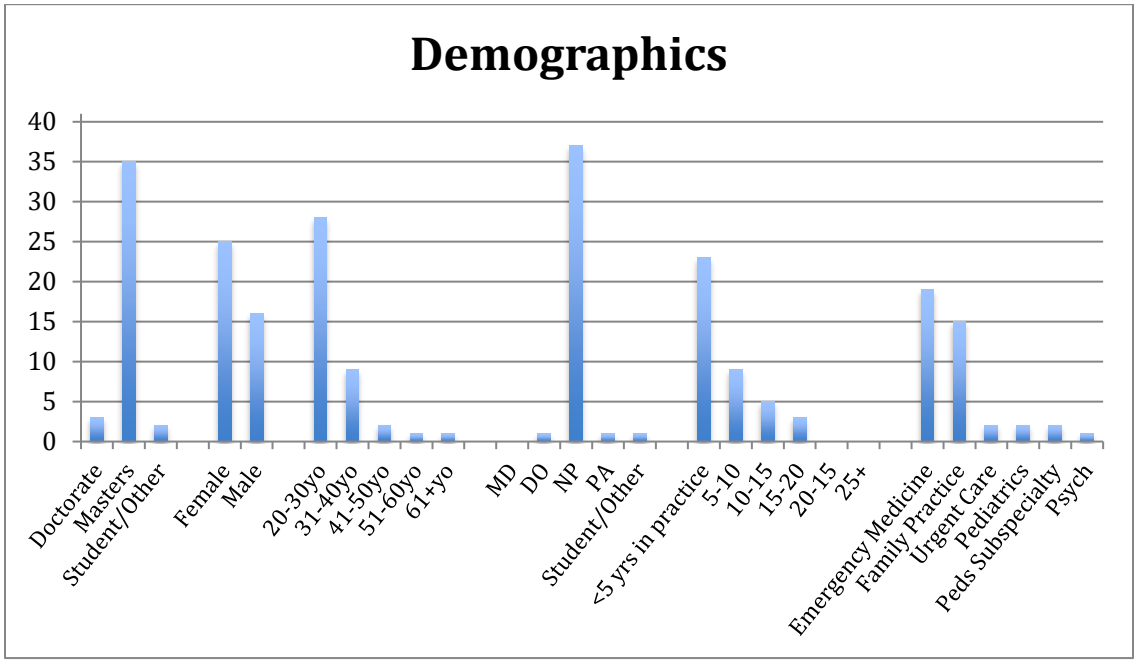
Demographic Data

The demographic data collected from the participants included to degree held, age range, years in practice, gender, professional title, and current practice specialty (Table 3a-e). The demographic data revealed that 7.5 % of participants (n=3) hold doctorate degrees, while 87.5% hold a masters degree (n=35). There were 5% of participants (n=2) who identified as other or students. Female participants were dominant in the sample group with 61% (n=25) who identified in that category. The age ranges varied, with the majority at 68% being in the 20-30 yr old range (n=28), 22% in the 31-40 yr old range (n=9), 5% 41-50 yr old range (n=2), 2% in the 51-60 yr old range (n=1), and 2% in the 61 yr+ age range (n=1).

Based on participants' answers, 56% of providers (n=23) have been in practice for 0-5 years, followed by 22% (n=9) for 5-10 years, 12% (n=5) for 10-15 years, 7% (n=3) for 15-20 years, with the remaining 2% (n=1) being in practice for over 25 years. The profession group was dominated by Nurse Practitioners who made up 90% of participants (n=37), followed by 5% other/student (n=2), 2% Physician Assistant (n=1), and 2% Doctor of Osteopathic Medicine (n=1). The participants were all required to belong to practices that saw children with no further limitations on specialty. Of the participants there were 46% that identified as currently working in emergency type settings (n=19), 37% in family practice (n=15), 5% in urgent care (n=2), 5% in pediatrics (n=2), 5% in a pediatric subspecialty (n=2), and 2% in psychiatric specialty (n=1).

Table 3:

Demographic information



Pretest and Posttest Study

All participation was on a voluntarily basis and begun with demographic information followed by the pretest. Immediately after the pretest, participants reviewed the educational material provided and followed with a posttest. Both pretest and posttest contained the same 15 questions about knowledge base on adverse childhood experiences. The 15 questions were a mixture of fill in the blank, select all that apply, and multiple choice type questions worth 1 point each. The questions focused on risks of developing adverse childhood experiences, prevention, provider screening, provider identification, treatment resources, and sequelae. The participants were to not use any outside resources or view the educational material prior to or during the pretest. Only after the pretest, were the educational resources provided by the researcher to be viewed

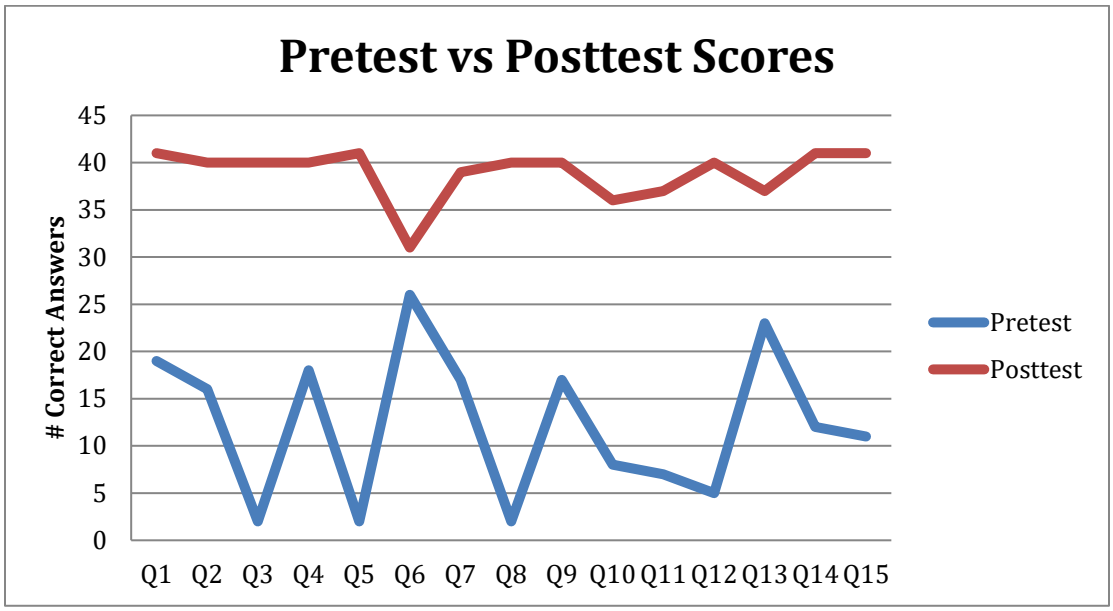
by the participants. The pretest and posttest links and the educational material were sent to participants via email after expressing willingness to voluntarily participate in the study.

Results of the Study

The results of the study concluded with statistical significance ($p<0.0001$) that the educational material provided increased the knowledge of the health care providers with on adverse childhood experiences. The *t*-test resulted in a value of -22.05, which means that the post-test outperformed the pretest. The level of significance was $p < .0001$. The pretest scores ranged from 0-15 correct answers, with one participant with the lowest score of 29% correct, and one participant with the highest score of 83%. The mean pretest score was 55% correct with a standard deviation of 13% in the pretest group (n=41). The posttest scores ranged 87%- 100% correct answers. Several participants scored 100% on the posttest after the education was given. The mean posttest score was 98% with a standard deviation of 3% in the posttest group (n=41). The mean for the pretest was 3.51 with a standard deviation of 1.61 and the mean of the posttest was 9.51 with a standard deviation of .711. All respondents (n=41) had an increase in posttest scores after the education was provided (Table 4).

Table 4:

Comparison of Participants Pretest/Posttest Scores



A t-test was performed with the results presented below (Table 5).

Table 5:

t-test results

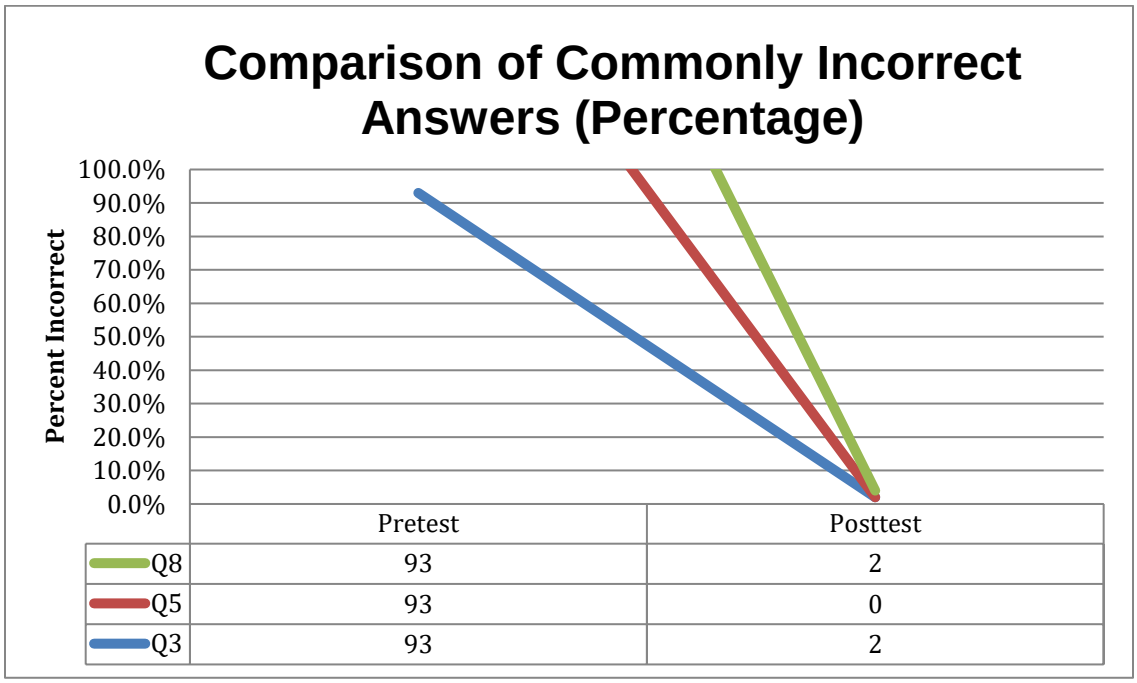
	Pretest	*Posttest*
Mean	*3.51*	*9.51*
Standard Deviation	*1.61*	*0.711*
Observations	*41*	*41*
Two-tailed *t*-test	-	*-22.05*
Avg Score	*55%*	*98%*
Lowest Score	*29%*	*87%*
Highest Score	*83%*	*100%*

The pretest and posttest questions were analyzed individually to determine questions that were most often answered incorrectly. This information helps identify areas that are widely unknown at baseline as well as those that continued to be incorrect. It also identifies where additional education in the future should focus. The 3 questions most commonly incorrect on the pretest were numbers 3, 5 and 8. The incorrect answers on the pretest and posttest are compared and displayed in *(Table 6).* Question 3 asks: "One single ACE poses what percent risk of additional ACEs?" The correct answer to this question is 95%. Only 7% (n=3) answered this correctly on the pretest. The Posttest comparison for this question was 98% correct (n= 40). Question 5 was a select all that apply question awarded 1 point only if the answer was fully correct. The question read:

"Which of the following are possible outcomes associated with ACEs? (Select all that apply)." The correct answers to be selected for this question are cancer, smoking, obesity, depression, and heart disease. Only 7% (n=3) answered this correctly on the pretest, however, 100% of participants (n=41) answered this question correctly on the posttest. The 3rd question with the lowest pretest score was number 8, which read: "What percentage of adults have reported experiencing at least 1 ACE?" This question proved to be challenging as only 7% (n=3) answered this correctly. Education proved to be helpful in increasing providers' knowledge on ACEs as the posttest results significantly improved, with a score of 98% total correct answers (n=40).

Table 6:

Comparison of Incorrect Answers



The lowest scoring question on the posttest had an average score of 76%. Twenty-four percent (n=10) of participants incorrectly answered posttest question number 6. This question was a true/false style question that read: “The ACE tool encompasses all forms of childhood trauma”. The correct answer is false; the tool encompasses major trauma categories such as verbal and physical abuse, physical sexual abuse, and neglect, but does not include verbal sexual assault and other adversities such as socioeconomical and ethnical disadvantages that may have related to adverse experiences and trauma. Further education on disparities related to socioeconomical and discrimination is warranted based on this finding.

Summary

Chapter four discussed the statistical analysis of the pretest and posttest study. A positive outcome evaluation was indicated by an increase in correct answers from the initial pretest on an identical posttest after providing the participants with education on ACEs. All questions were specific to facts on ACEs. Increase in correct responses after educational modules are linked to increased understanding on what ACEs are, the risk factors involved, how to identify them, and how to provide appropriate intervention.

The data gathered revealed an increase in posttest scores, when compared to baseline pretest scores, revealing statistical significance at $p<0.0001$. The findings of the study support that many providers who regularly care for children are not aware of ACEs and the impact they make on the community. Although information is provided through some school curricula, continuing medical education, websites, guidelines, and research, providers need additional education on ACEs to better care for children in their communities. The findings of this study confirm the need for focus on education for providers on ACEs.

Chapter V

Introduction

The study on adverse childhood experiences included education geared toward all advanced practice providers such as nurse practitioners, physician assistants and physicians who care for children. The purpose of the study was to determine if additional education on adverse childhood experiences would improve knowledge base and therefore increase identification, prevention, and treatment for children at risk. The study used a pretest to assess the providers' baseline knowledge on this topic. The providers then reviewed the education, and a posttest was performed to evaluate if there was an increase in knowledge after the education was provided.

Relationships of Outcomes to Research

Increased overall knowledge

Initial baseline knowledge was tested via pretest prior to participants reviewing educational materials. Only 46% of participants knew what ACEs stood for. The lowest score on the pretest was 29%, with the average score being 55% amongst all who were surveyed. After the education was reviewed, the increase in scores on the posttest was astonishing. The lowest score on the posttest, after the education was provided, was 87%. The average score rose to 98%. By the end of the education, 100% of participants knew what ACEs were. With an identified risk of greater than 50% of the population having at

least one ace in their lifetime, it is important that healthcare providers are aware of what this even means at surface level (Centers for Disease Control and Prevention, 2019).

Allow health care providers to better identify children at risk

Question 2 on the pretest and posttest was a select all that apply question that specifically served to test providers' knowledge on identifying children at risk. On the pretest, only 41% answered this question correctly. After the education was provided, 98% of the participants answered this correctly and were able to identify factors that placed children at risk. There are multiple socioeconomical factors that increase childhood risk of adversity such as race, poverty, younger age of the child, and childhood illness. In addition to these socioeconomical factors, there are even more powerful risk factors such as having incarcerated household members, a mother who is a domestic violence victim, and being in an environment where parents abuse alcohol (Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016). Based on data from the surveys, healthcare providers were able to better identify children at risk more than two-fold.

Promotion of proper intervention and referral

It is difficult to know how to properly intervene on a topic you know little about. The educational module helped increase overall knowledge about ACEs as well as how to provide appropriate intervention for those at risk. Question 12 was a select all that apply based on interventions a healthcare provider my supply for these children and families. The pretest resulted in only 12% of participants total that were able to identify correct answers (n=5). The posttest showed significant knowledge gain on the topic of intervention and referral with an increase in 98% with correct scores (n=40). Clinical practice guidelines recommend healthcare providers provide appropriate intervention

when ACEs are identified such as placing referrals to appropriate counseling/therapy, home based programs, facilitating admission to childhood education programs available locally, and referring parents to available community resources (Fortson et al., 2016). Based on the data from this research, the participants were able to identify appropriate interventions to provide to those at risk.

Identification of common sequelae associated with ACEs

Some of the sequelae associated with ACEs include increase in smoking, drug use, alcoholism, sedentary lifestyle, high risk sexual behaviors, and poor work performance, obesity, diabetes mellitus, heart disease, stroke, COPD, cancer, physical injury, sexually transmitted infections, anxiety, depression, and suicide attempts (CDC, 2019; Fortson, Klevens, Merrick, Gilbert, & Alexander, 2016). The survey asked participants to identify some of the consequences of ACEs. The pretest displayed one of the most missed topics was based on these consequences of ACEs with only 7% able to fully identify these sequelae (n=3). With educational modules that informed participants on this topic, there was improved knowledge based on a posttest score of 100% for this same question (n=41).

Observations

When pretest and posttest results are both reviewed individually and compared, there are many observations that can be made based on data. Initial pretest data proved that knowledge base on ACEs prior to the education provided in this study, was poor. The lowest score on the pretest was 29%, the median was 54% and the mean was 55%. After education was provided, the posttest scores greatly increased with the lowest score 87% a median of 100% and a mean of 98%. Observation made based on this data is that

the education was successful in increasing providers' awareness and knowledge on ACEs. Education on this topic is observed as beneficial to healthcare providers and the children and families they care for. The education improved the posttest scores correlating to an increased knowledge in ACEs with a level of significance of $p < .0001$. Though the sample size is small, additional observation may be made that baseline curriculum of healthcare programs may not provide adequate teaching on this topic and additional education may be helpful for many. Increased knowledge on this topic is observed as an increased likelihood of recognizing risk and preventing further consequences by appropriately intervening.

Evaluation of Theoretical Framework

The Modeling and Role Modeling Theory encouraged the work of this study by pushing nurses to consider every patient's unique situation and to aim provider care and intervention specific to individual needs. Generally speaking, there are general needs for those who have experienced ACEs or are at high risk for ACEs. While education can help healthcare providers learn about general needs, the framework also helps support providers to recognize further individualized risk and needs. Using this framework in addition to the knowledge gained from the intervention of the study, providers will be better prepared to provide compassionate and informed care while facilitating necessary interventions for these patients. Based on the theoretical framework, which aligns with what is known and what the education aims to teach, increased ACEs will decrease the ability of children to adapt and cope with stressors. This will increase their overall need for intervention as their risk for negative outcomes also increases (Petiprin, 2016).

Evaluation of Logic Model

This study evaluated participants' knowledge on ACEs both at baseline before education via pretest and after an educational module based on posttest. Evaluation was based on the objective of this study using the logic model. The outcomes that were evaluated for this study included: providers reviewing and utilizing the educational resources that are provided, providers were able to identify patients who had experienced ACEs or had risk factors, and providers were able to identify prevention strategies and interventions available for those at risk of consequences of adversity.

Based on the results of the study, there was a positive outcome that was measured by provider responses on the posttest that proved increased knowledge about ACEs and the associated consequences. The participants were able to demonstrate increased ability to recognize risk factors and intervene appropriately when needed. The pretest and posttest score proved that education was beneficial in improving providers' knowledge on many aspects of ACEs.

Study Limitations

This design was chosen for its many strengths that outweigh the possible limitations. According to Terry (2018), a limitation of the pretest-posttest design is that there is no randomization or control group, weakening the design. It may be hard to determine if it was the intervention or some other factor altering the posttest results. Another limitation is there was a potential for selection bias of who is selected to participate in the research. Other limitations include small sample size, internal data analysis and validity concerns, lack of follow-up data, and lack of self-reported perceptions of their knowledge improvement.

An unexpected limitation was revealed in the analysis of the results portion. The pretest and posttest studies were both entered via links. While the pretest link had demographic data, the posttest did not have any demographic data or other identifiers. This made connecting the pretest data to the specific individual's posttest results not possible. The data points had to be treated as two independent sources during statistical analysis, which is not true to the study. Since the pre- and posttest scores could not be directly connected, the researcher was unable to determine who benefitted most from the training, which changes occurred and why.

Implications for Future Research

Future research would allow researchers to address some of the limitations that were presented. Proper linking of data sets from pretest and posttest results while respecting confidentiality could allow further variables to be considered. It would be beneficial for future research to do follow-up surveys to determine if education was retained, if there were self-reported improvements, and to determine if practice changes occurred over time. This study scratched the surface at improving providers' knowledge base on ACEs, future studies could evaluate if actual practice change occurred and could lead to evaluation of impacts this has on children in practice.

Further knowledge is needed among providers on screening and intervening for ACEs. There is still so much to be learned about ACEs and how deeply their impact influences the development of children and communities. Beyond the scope of this study was true prevention of ACEs amongst our children. Based on what we know about ACEs, additional studies on strategies to mitigate the impact by early prevention are warranted.

Implications for Practice, Policy, and Education

The desired outcome for this study was to determine if education would improve healthcare providers' knowledge on ACEs, allow them to better identify children at risk of, or already experiences ACEs, and increase likelihood of recognition and intervention in effort to decrease consequences, and promote proper intervention. The goal of this study was to provide this education to providers in order to help in the fight against ACEs. The result of this study provides valuable data on how education can improve providers' awareness and response on ACEs. This information has the potential to change educational institutions curriculum, practices utilized by healthcare organizations, education offered in continuing education courses, and community programs to facilitate response to ACEs. Screening and intervening, when necessary, should become a regulated quality indicator in practice setting that care for children.

This study can help push for future policy change, to ensure children are not fighting ACEs alone. A policy brief on this topic could influence leaders to open more programs for awareness as well add resources for intervening and preserving the mental and physical health of children in communities across the nation. This study alone can provide education for providers at surface level, in hope that inspires even further education on this topic in the future. As data reveals, most providers are not readily aware of what ACEs are, how this impacts individuals, and how to intervene. This study opens points of discussion to push for additional education and awareness.

Conclusion

The study proved that the majority of providers are not well versed on ACEs at baseline. Participants were given educational tools to on this important topic, which proved to increase knowledge on identification and intervention for children at risk. A knowledge deficit can leave many children with increased risk of further ACEs and poor health outcomes due to providers' inability to recognize ACEs and intervene proactively. The information gathered from this study was valuable in determining the need for future education for healthcare providers on ACEs. The aim of this study was to provide education to healthcare providers and determine if knowledge was gained in a way that may contribute to improved outcomes for children. Screening and recognition come first, but just as important is intervention using a multidisciplinary approach involving many resources and professionals. ACEs lead to long-term individual and societal problems. This study provides data as evidence that more education and awareness is needed to reduce the impact of ACEs and improve the lives of our children.

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APPENDIX

Appendix A:

Code_____

Adverse Childhood Experiences Pretests Survey

Pretest

Demographics:

1. What is your highest completed degree?

- Doctorate
- Masters
- Other

2. What is your gender?

- Male
- Female
- Other

3. What is your age range?

- 20-30
- 31-40
- 41-50
- 51-60
- 61+

4. How many years have you been in clinical practice?

- Less than 5
- 5-10
- 10-15
- 15-20
- 20-25
- 25+

5. Which profession do you belong to?

- MD
- DO
- NP
- PA
- Other

6. What is your current specialty?

Pretest Questions

1. What does ACEs stand for?

2. Which of the following is considered an ACE? (select all that apply)

A. Having a household member who is incarcerated
B. Living with a mother who is a victim of domestic violence
C. Watching your parents abuse alcohol
D. Not receiving childhood immunizations

3. 1 ACE poses what percent risk of additional ACEs?

A. 95
B. 85
C. 80
D. 65

4. ACEs most commonly lead to: (select all that apply)

A. High risk behaviors
B. Negative health outcomes
C. Higher achievements
D. Positive coping mechanisms

5. Which of the following are possible outcomes associated with ACEs? (select all that apply)

A. Heart disease
B. Depression
C. Cancer
D. Smoking
E. Obesity
F. None of the above

6. The ACE tool encompasses all forms of childhood trauma

A. True
B. False

7. What is the highest ACE score on the screening tool?

A. 5
B. 8
C. 12
D. 10
E. 15
F. 20
G. None of the above

8. What percentage of adults have reported experiencing at least 1 ACE?
A. 10
B. 18
C. 35
D. 50
E. 64
F. 78
G. None of the above

9. Approximately what percentage of current children have experienced at least one single ACE?

A. 25
B. 33
C. 50
D. 66
E. 75
F. 100

10. Fill in the blank: _____ Stress response is a normal part of healthy development in response to challenges and s characterized by brief increases in heart rate and mild elevations in stress hormones, which quickly return to normal.

11. Fill in the blank: _____ stress response can occur when a child is exposed to severe, frequent or prolonged trauma and can result in changes in the brain's layout & function, can affect learning, development, & long-term health outcomes.

12. As a healthcare provider what are some things you can do to help children that face ACEs? (select all that apply)

A. Educate patients and families about the impact of toxic stress
B. Advocate for interventions that mitigate the impact of ACEs
C. Screen children using the ACEs questionnaire
D. Provide information to parents on community resources
E. Place referrals to appropriate therapists
F. Report suspected abuse to child protective services
G. Become SEEK trained

13. Routine screening should be performed on all children by their PCP

A. True
B. False

14. Which axis of the nervous system is most over-stimulated by stress?

A. hypothalamic–pituitary–prolactin
B. hypothalamic–pituitary–somatotropic
C. hypothalamic–pituitary–thyroid
D. hypothalamic–pituitary–gonadal
E. hypothalamic–pituitary–adrenal

15. Name 2 hormones that can be harmful when overproduced by stress/trauma by the axis listed above:

1. _____
2. _____

Appendix B:

Code_____

Adverse Childhood Experiences Posttest Survey

Posttest

1. What does ACEs stand for?

2. Which of the following is considered an ACE? (select all that apply)

E. Having a household member who is incarcerated
F. Living with a mother who is a victim of domestic violence
G. Watching your parents abuse alcohol
H. Not receiving childhood immunizations

3. 1 ACE poses what percent risk of additional ACEs?

A. 95
B. 85
C. 80
D. 65

4. ACEs most commonly lead to: (select all that apply)

A. High risk behaviors
B. Negative health outcomes
C. Higher achievements
D. Positive coping mechanisms

5. Which of the following are possible outcomes associated with ACEs? (select all that apply)

G. Heart disease
H. Depression
I. Cancer
J. Smoking
K. Obesity
L. None of the above

6. The ACE tool encompasses all forms of childhood trauma

A. True
B. False

7. What is the highest ACE score on the screening tool?

H. 5
I. 8
J. 12
K. 10
L. 15
M. 20
N. None of the above

8. What percentage of adults have reported experiencing at least 1 ACE?
H. 10
I. 18
J. 35
K. 50
L. 64
M. 78
N. None of the above

9. Approximately what percentage of current children have experienced at least one single ACE?

G. 25
H. 33
I. 50
J. 66
K. 75
L. 100

10. Fill in the blank: _____ Stress response is a normal part of healthy development in response to challenges and s characterized by brief increases in heart rate and mild elevations in stress hormones, which quickly return to normal.

11. Fill in the blank: _____ stress response can occur when a child is exposed to severe, frequent or prolonged trauma and can result in changes in the brain's layout & function, can affect learning, development, & long-term health outcomes.

12. As a healthcare provider what are some things you can do to help children that face ACEs? (select all that apply)

H. Educate patients and families about the impact of toxic stress
I. Advocate for interventions that mitigate the impact of ACEs
J. Screen children using the ACEs questionnaire
K. Provide information to parents on community resources
L. Place referrals to appropriate therapists
M. Report suspected abuse to child protective services
N. Become SEEK trained

13. Routine screening should be performed on all children by their PCP

A. True
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15. Name 2 hormones that can be harmful when overproduced by stress/trauma by the axis listed above:

1. _____
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