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# Nurse Practitioner Screening for Adverse Childhood Outcomes in Adult Primary Care

Mary B. Shafer

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Nurse Practitioner Screening for Adverse Childhood Outcomes in Adult Primary Care

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### Abstract

Adverse childhood experiences (ACE) contribute to negative health outcomes. The impact of ACE is linked with physical, mental, and developmental disruption, increase in health-risk behaviors, and increased healthcare utilization. Approximately sixty percent of the US population reports a history of ACE. Despite this growing evidence that ACE is associated with health problems, primary care providers infrequently screen patients for ACE, nor do they consider the impact of ACE on health. The lack of routine screening for ACE in primary care represents lost opportunities to impact health outcomes and promote wellness. The overall goal of this project is to translate research to practice through screening for ACE in an adult primary care clinic. To accomplish this goal, brief interviews were conducted with 71 adult patients in a busy primary care clinic over a 4-week period. The ACE questionnaire, and a post-screening form were used to collect information about ACEs, patient responses, and follow-up recommendations. Descriptive statistics were used to calculate prevalence of ACEs, follow-up recommendations and patient responses to the screening intervention. Findings from the project demonstrated that high ACEs are associated with negative health outcomes and are linked with chronic health problems and increased healthcare utilization. Despite these associations very few patients were receiving counseling. ACE screening times took less time than anticipated and NP student interviewers felt comfortable and confident during the screening intervention. Findings support the need to screen for ACEs in primary care especially in patients with chronic disease.

*Keywords: abuse, childhood, primary care, review, evidenced based practice, family history, screening, advanced practice nurse, child maltreatment, child trauma, child misfortune, adverse childhood experiences*

## **Introduction and Background**

Chronic diseases account for more than seventy percent of deaths each year and contribute towards eighty-six percent of our nation's healthcare costs (Centers for Disease Control, 2016). More than half of all American adults have a chronic disease, and more than one third have multiple chronic diseases (Centers for Disease Control, 2016). In response to this overwhelming incidence of chronic disease, healthcare leaders are charged with a responsibility to understand factors contributing towards chronic disease, including preventative health practices. The Centers for Disease Control and Prevention (CDC) define "Four Domains for Chronic Disease Prevention", they include; evaluating epidemiology and surveillance; environmental approaches; healthcare system interventions; and community-clinical links (CDC, 2016). A report by the Robert Wood Johnson Foundation describes the importance of the delivery of preventative, early identification of disease, and implementation of secondary and tertiary prevention strategies to reduce disease progression (Robert Wood Johnson Foundation, 2010). Strategies to better understand which providers are best equipped to provide these services have become an area of consideration.

Given the national health crisis surrounding chronic disease, a study was conducted to identify differences in healthcare education delivery in patients regarding asthma education, diet and nutrition, exercise, stress management, tobacco use and exposure, and weight reduction (Ritsema, Bingenheimer, Scholting, and Cawley, 2014). In this study, physician assistants and nurse practitioners were more likely to carryout health education for patients with chronic diseases, given the patient centered training programs for these specific disciplines. Furthermore, patients are more likely to receive healthcare education from nurse practitioners and physician assistants due to patient comfort with disclosing healthcare information to these non-physician

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providers (Ritsema, Bingenheimer, Scholting, and Cawley, 2014).

A focus on disease prevention is a key component of nursing practice. The US Preventative Task Force supports that advanced practice nurses are equipped with the resources to make an impact in prevention and primary care (U.S. Preventative Services Task Force, 2016). The Task force also declared that Nurse Practitioners specifically understand the importance of prevention, as well as have the skills to support patients' efforts to change behaviors and utilize behavioral interventions to promote effectiveness (US Preventative Services Task force, 2016). The role of the nurse practitioner, in identifying factors contributing to chronic disease in primary care, is an important component of the collective effort to decrease negative health outcomes for individuals with chronic disease.

One key contributor of chronic disease was identified by Felitti and colleagues. In this landmark study persons who experienced emotional, physical, or sexual abuse, or who spent their childhood amidst household dysfunction, were more likely to adopt health risk behaviors that led to adult chronic diseases (Felitti, et al, 1998). Similarly, the CDC conducted a Behavioral Risk Factor Surveillance System study of more than twenty-six thousand participants in five states, that found more than sixty percent of respondents reported ACE. This correlation of ACE with significant lifelong health problems has been linked with poor health and lifestyle outcomes, and may also provide insight into the long-term management of the widespread effects on adult chronic disease.

Adverse childhood experiences (ACE) were initially defined as exposure to abuse and household dysfunction during childhood (Felitti, et al., 1998). More recently, the conceptual meaning of ACE has been defined as experiences in a child's life that are harmful, chronic, distressing, cumulative, and varying in severity (Kalmakis & Chandler, 2013). Harmful

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experiences may either be negative experiences, or the lack of positive experiences in childhood. Chronic experiences are reoccurring overtime. Distressing events are those that lead to a lack of control or exposure to chronic stress that contribute towards psychological and physiological changes in exposed individuals. Cumulative describes the relationship of accumulation of adversity and dysfunctional events over time. Finally, severity is significantly dependent upon the individual's response, or perceptions, of the events (Kalmakis & Chandler, 2013). Utilizing this conceptual framework, nurse practitioners may be better equipped to address ACE in primary care, and their impact on health behaviors, chronic disease, and other current health problems.

While prevention strategies among children are an essential strategy to avoid the negative implications of ACE, it does not address the implications for adult individuals that have already encountered ACE (Centers for Disease Control and Prevention, 2016). ACE have been associated with substance use and dependence, depression, cardiovascular disease, diabetes, cancer, and premature mortality (Centers for Disease Control, 2010). Despite this growing problem, primary care providers infrequently screen patients for adverse childhood experiences, or evaluate the impact of childhood experiences on patients' well-being. In a survey of providers in Massachusetts, Weinreb discovered that less than one third of primary care providers screened for childhood trauma or abuse (Weinreb, et al., 2010). Kalmakis and Chandler found similar results in their study examining NP screening in primary care. They discovered that 33% of the NPs surveyed screened for adverse events in adult primary care. Barriers identified a lack of time, comfort in inquiry, lacking confidence in their ability to help, and concerns for inducing additional distress (Kalmakis, et. al, 2016). Due to this gap in translation of research evidence to clinical practice, it is necessary to develop a brief, effective, and compassionate screening tool to

identify ACE in an adult primary care setting.

### **Problem statement**

Barriers to screening for ACE in primary care include lack of time, comfort in inquiry, lacking confidence in their ability to help, and concerns for inducing additional distress and is indicated by less than 33% of NPs screening for ACE in primary care (Kalmakis, et. al, 2016). This lack of screening may contribute to missed opportunities to promote disease prevention and impact health behaviors, chronic disease, and other current health problems in adult patients that have experienced ACE.

### **Review of the Literature**

A systematic review of the literature was conducted reviewing multiple factors surrounding the impact of ACE, utilizing the John Hopkins Evidence Based Practice Rating Scale (Newhouse, et al., 2005) as a guide to the strength of evidence found. PubMed and Cinhal Databases were used to search for the key terms: “adverse childhood experiences”, “chronic disease”, “screening”, “primary health care”, “adverse childhood events”. Articles published between 2011 and 2016 were included, except for the 1998 landmark research by Felitti and colleagues, which was included. Articles were included based on their specific application to ACE and chronic mental and physical disease in adult patients.

The historical work of Felitti and colleagues in 1998 provided evidence for a significant relationship between adverse childhood experiences and the development of chronic diseases (Felitti, 1998). This work offered a foundation for further exploration by the Centers for Disease Control and Kaiser Permanente’s Department of Preventative medicine to support further research regarding the effects of ACE on adult chronic disease (Kalmakis & Chandler, 2014).

A Level 1, Type A (Newhouse, et al., 2005) systematic literature review regarding the

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health consequences of ACE was conducted by Kalmakis and Chandler from a collection of 42 related articles and was published in 2014. From this extensive review their work summarizes the significance of ACE on the development of negative health outcomes. The evidence supports the physical implications of ACE on the development of cardiovascular disease, autoimmune related illness, and gastrointestinal disease. In addition to the findings of physical exacerbations, they also demonstrated support of a strong association between ACE with mental health and addiction concerns including depression, PTSD, risk taking behaviors, and substance abuse. Finally, their systematic review provided a discussion of developmental health disruptions in sleep and nutrition. (Kalmakis & Chandler, 2014). Since this work was conducted, additional research studies have also been published to support this discussion of negative effects of ACE on adult health.

Fourteen additional Level 1, Type A high quality (Newhouse, et al., 2005) articles that continue to demonstrate the relationship between ACE and risk behaviors (Campbell et al., 2016, McCauly al., 2015), psychological exacerbations in adulthood (Chen, et al., 2014, Curran et al., 2016, Ege et.al., 2014, Garcia, et al., 2015, McCrory et al., 2015, Rudenstine, et al., 2015, Schaaxks et al., 2015, and Sun et al., 2016), metabolic and physical illness (Crosswell et al., 2014, Curran et al., 2016, Davis, et al., 2014, McCrory et al., 2015), and lived experiences and poor quality of life (Campbell et al., 2016, Gjelsvik et al., 2014, McCauly et al., 2015, and Sun et al., 2016). New evidence also reflects the negative effects on genetic variables in patients experiencing ACE and contributing to negative health outcomes and permanent genetic alterations in individual's experiencing chronic stress (Chen et al., 2014, Levine et al., 2015). Two applicable articles were identified each published in 2016. These Type A, Level 1 (Newhouse, et al., 2005) studies each address the importance of incorporating ACE screening in

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primary care settings by primary care providers. Each of the two studies, discussed the importance of screening patients in the primary care setting for ACE speculating that screening patients can have an impact on the determinates of poor health outcomes.

In the study conducted by Glowa, et al., the researchers found that 62% patients screened positive for at least one ACE, and 22% reported four or more ACE. These findings are consistent with the Kaiser Permanente studies. Interestingly however, despite these positive screenings performed by clinicians in the primary care office, very few changes were made in the patient treatment plan. Despite the finding that the use of the formalized ACE questionnaire was an acceptable tool to screen patients based on the expansive nature of the assessment that enhances the intake process of childhood adversity (Glowa, et al., 2016).

A sample of nurse practitioners in Massachusetts were surveyed regarding ACE screenings in primary care (Kalmakis, et al., 2016). The researchers identified barriers to implementation of routine screening that included lack of confidence in screening, insufficient time for screening, concern about traumatizing patients, and concerns for lack of resources or skills to support positive screening (Kalmakis, et al, 2016).

In addition to the above review of literature, a final literature review was conducted utilizing Cinhal and PubMed Databases with the search terms “motivational interview”, “SBIRT”, and brief screening and interventions. From the search, there were four articles that addressed the practice of motivational interviewing in primary care. The consensus was that patients benefited by use of Motivational interviewing (MI) specifically when the provider was educated and willing to conduct the interview with the patient (Benzo, et al, 2013, Bishop, et al., 2013, Coyne, et al., 2014, Purath, et al., 2014). Bishop et al., discussed the role of the nurse practitioner in this process as a key stakeholder given the advanced training, increased time with

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patients, and willingness to participate in preventative health programs in primary care (Bishop, al, 2013). These thoughts were consistent with the statement from The US Preventative Task Force that nurse practitioners would serve a valuable role in the implementation of preventative health services based on training, availability, and anticipated changes within our healthcare system (USPTF, 2016)

There were five additional resources that were specifically identified regarding the implementation of a Screening, Brief Intervention, and Referral for Treatment protocol (SBIRT) in primary care that supports that with proper training there is significant evidence that SBIRT can impact behavioral health problems pertaining to substance abuse specifically (Agerwala et al, 2012, Dunn, et al, Kaiser, 2015., Moyer, et al. 2013, Reho, et al., 2016). The significant gap in practice is that this intervention has rarely been implemented for nonsubstance abuse related problems, despite its success with behavioral health concerns. Similarly, to MI techniques and routine screening for ACE, providers often reported concern that there was a lack of time, motivation, and that competing clinical priorities for implementing SBIRT existed in primary care (Dunn, et al., 2014).

Nurse practitioners have been identified as valuable members of the healthcare team in implementation of both motivational interviewing and SBIRT techniques in the primary care setting. This translational pilot study will be used to evaluate the effectiveness of implementing MI and the SBIRT technique among adults with histories of ACE, and will allow for recommendations based on the evidence to share with the others and address this gap in practice.

### **Theoretical Framework**

Levine's Conservation Model for nursing directly pertains to the existence of chronic disease in adult patients that have experienced adverse childhood events. Levine describes

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individuals as an extension of experiences that contribute towards wholeness (Levine, 1969). She describes individual's well-being as a range of external factors that affect conservation.

Conservation of the individual promotes wellness and is dependent upon four main elements consisting of energy, structural integrity, personal integrity, and social integrity (Abumaira, Hastings-Tolsma, & Sakraida, 2015). She describes that desynchronization of these various levels of conservation affect one's wholeness and well-being and can contribute towards the development of organismic responses (Levine, 1969). Organismic responses such as with repeated stressful events, or use of repeated energy promotes physiological changes such as inflammatory responses and adrenal responses to stress which can result in long-term reactions that impact individual life experiences. These repeated negative events add to the total sum of individual's life experiences and should be considered by nurses as they provide care to patients as entire individuals rather than a collection of parts or conditions. Nurses specifically are trained to recognize the influence of these stressors as well as the impact of therapeutic progress in healthcare which can be useful in managing care of individuals with chronic health problems. Levine suggests that nurses have a specific role to help patients recognize the environmental influence on their conservation and help restore wellness to individuals.

Many of these elements can be translated into practice regarding ACE and have been linked with negative health outcomes in adult patients. The negative health outcomes of ACE have been shown to contribute towards the current chronic disease national health crisis. It has been proposed that screening patients for adverse childhood outcomes and implementing brief interventions may help guide restoration to wellness in adult patients that have, as Levine describes, experienced desynchronization of their wholeness as individuals over time (Abumaria, et al., 2015). As adult patients struggle with chronic health problems, Levine's conservation

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model can help to promote adaptation by targeting interventions that help restore personal integrity and promote improved outcomes. Screening by nurse practitioners in primary care with the use of motivational interviewing specifically can help individuals that have not recognized their own personal or environmental imbalances to restore self-identification, and resources to restore wellness (Abumaria, et al., 2015).

### **Project Description, Implementation, and Results**

#### **Project Design and Methods**

A brief screening intervention, based on research evidence of ACE and health outcomes in adults, was designed. The intervention used motivational interviewing techniques and the SBIRT approach to patient interaction, in a primary care clinical practice setting. To prepare the nurse practitioner students to successfully use motivational interviewing as a technique in this screening interview protocol the students attended two, two-hour educational sessions conducted by the research faculty. The education sessions included an introduction to the problem of ACE and health, motivational interviewing as a technique to successful patient encounters, and mock interviews.

Following educational preparation, the nurse practitioner students, under the guidance of faculty researchers, and a health center nurse practitioner, conducted brief screening interventions with patients. Eligible patients were identified by the health center nurse practitioner. The office staff then escorted patients checking in to a small conference room where the patient was provided the opportunity to accept, or decline, participation in a short interview by a nurse practitioner student. If agreed, the nurse practitioner student informed the patient of the study, reviewed the informed consent and acquired the patient's signature. Next the student used a three-phase protocol designed by the faculty researchers to screen patients for ACE.

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Following this protocol, the nurse practitioner student provided information to the patient regarding the purpose of the screening. This was done by sharing the evidence of childhood experiences and long-term health with each patient. Then the student asked about the patient's childhood adversity in a non-judgmental manner. Following the opportunity to report ACE, a 17-question ACE measure was used to assess history of ACE. Following the ACE measure, the student responded with compassion and offered referral to the primary care provider based on a positive ACE response, or patient request. This approach fit well with Levine's theoretical framework regarding desynchronization and the principles of motivational interviewing.

Following the intervention, the student completed a post intervention form (see appendix II) to gather information about patient responses, nurse practitioner comfort level with screening, and time to complete the interview in the primary care setting. Unidentifiable patient demographic information was collected to describe the intervention population, including gender, age and diagnosed health conditions. The feedback from the nurse practitioner student provided some qualitative data regarding the brief intervention experience and provided insight into a greater understanding of implementing adverse childhood adversity screening in the adult primary care setting.

### **Inclusion and Exclusion Criteria**

Adult patients over the age of 21 who presented to the primary care office on the interview days were asked to participate based on the nurse practitioner's considerations of their chronic health problems. Patients with the following health problems were included: obesity (current or past history), GI complaints, chronic disease not well managed, PTSD, anxiety, depression, or a substance abuse disorder as well as patients without prior reports of chronic disease. Patients that also reside in high risk settings such as homeless shelters and women's

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shelters were included if applicable. Lastly, patients with high healthcare utilization (3 or more visits in a 6-month period) will be included.

Patients were excluded if they were under 21, did not have a diagnosis that fit the sample population, or were unwilling to provide consent to the screening interview.

### **Setting and Resources and organizational analysis of the project site**

This project took place in a patient-centered adult primary care medical home in Central Massachusetts. The primary care practice consists of one nurse practitioner board certified in both adult primary care and mental health counseling, along with her support staff. Additionally, a psychologist uses an office within the clinic and was available for patient referral. This single provider practice is independently owned and operated under the management of the advanced practice nurse practitioner and supports a patient driven holistic care model.

### **Description of the group, population or community**

The medical NP practice utilized is in a small town in Western Massachusetts consisting of approximately 2,200 individuals. The community demographic report indicates 95% Caucasian individuals, 2.3% Hispanic, 0.2% Asian, 0.4% African American and less than 1.3% other races live in this community. Within this small community the incidence of adult diabetes is 8% and is consistent with the states average of approximately 8.1%. Similarly, individuals with obesity (24%), elevated BMI (27%), and overweight (31.3), are consistent with state averages of 22.5% 28.5%, and 33.4% respectively. Sixty nine percent of individuals report general good health as compared to the Massachusetts average of 56% (City-Data.com, 2016). Given the relative representation of this town with the state of Massachusetts averages, it served as a reasonable community to implement this brief intervention and screening tool.

The key stakeholder for the project was a well-established primary care nurse

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practitioner. She agreed to share her expertise and patient population for this project. Patients were selected with consideration of the inclusion criteria prior to obtaining written consent for participation the study. The projected sample size was approximately 40 patients over a 4-week period.

### **Cost-Benefit Analysis/Budget**

There are no direct costs associated with this project. DNP student research assistants will conduct the screening and intervention without monetary costs or gains. The potential benefits for improving health outcomes of individuals with chronic diseases cannot be estimated however is projected to have a significant impact of the generalized wellbeing of patients that have potentially experienced ACEs and therefore will result in an overall reduction in costs of future healthcare costs over time.

### **Objectives**

The impact of ACE has been linked with physical, mental, and developmental disruption, increased health risk behaviors, and increased healthcare utilization. The overall goal of this project was to translate research to practice through screening for ACE in an adult primary care clinic. The objective was to conduct a pilot study to assess the feasibility of a brief interview screening to assess patients for ACE in an adult primary care clinic. Demographic and statistical findings obtained from this project describe characteristics of patients including data about ACE, chronic disease, current psychological counseling, length of time spent on screening, and provider comfort in screening.

### **Ethics and Human Subjects Protection**

The project has been approved by the UMass Amherst Institutional Review Board (IRB). All eligible subjects were approached and educated regarding the informed consent and the

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opportunity to participate, refusal to participate, or termination of the interview at any time. Subject questionnaires and consents were coded with unidentifiable coding to ensure privacy and eliminate any potential violation in patient health confidentiality. All content recorded and discussed with the individual and health care provider utilized the standards and practices of the Health Insurance Portability and Accountability Act of 1996 (HIPPA, 1996). The DNP student and study committee have completed CITI Certification including social and behavioral considerations. All information collected, as part of this project was aggregated data from the project participants, and did not include any potential patient identifiers. The risk to patients participating in this project was limited to their emotional responses to previous experiences. The health center nurse practitioner was present in the clinic during all interviews and was available for referrals as needed. No significant ethical problems or human subject violations arose during the time of the project.

### **Evaluation**

#### **Results, Findings, and Data Analysis**

The data was reviewed utilizing both Excel and SPSS software and coded in preparation for analysis. The coded data were double checked for accuracy by a second research team member. Descriptive statistics were used to evaluate characteristics of the interviewed patients. The total number of subjects screened 71. All patient screened, met the inclusion criteria and consented to participate in the interview.

Of the 71 patients screened, 22 (31%) were males and 49 (69%) were females. Of these subjects, 71 patients (100%) were White or of European decent. Of the 71 patients screened, 17 (23.9%) were single, 32 (45.1%) married, 4 (5.6%) 13 (18.3%) divorced, and 5 (7.0%) widowed. Patient ages were well distributed (Table 1)

*Table 1**Age of participants*

<i>Age range</i>	<i>Percent</i>	<i>Number</i>
21-30	8.5%	6
31-40	19.7%	14
41-50	15.5%	11
51-60	29.6%	21
61-70	18.3%	13
71-80	8.5%	6
over 81	0.0%	0

Of the 71 patients screened, 13 (18.3%) were identified as not having experienced ACE, or reported an ACE questionnaire score of zero (out of 19). Fifty-eight (81.7%) reported at least one positive ACE score. Self-reported chronic diseases included a wide variety of diagnosis. Chronic diseases that occurred in more than five percent of the patient population are listed in Table 2. The average ACE score for patients with specific self-reported diagnosis were also noted (Table 3).

Table 2

*Self-reported Diagnosis*

<i>Diagnosis</i>	<i>Percent</i>	<i>Number</i>
Depression	39%	28
Anxiety	38%	27
Cardiovascular disease	31%	22
Diabetes	10%	7
Chronic Pain	17%	12
Chronic Respiratory	14%	10
Obesity	11%	8
PTSD	10%	7
Arthritis	8%	6
Bipolar	8%	6
No Reported Diagnosis	7%	5
Substance Abuse	6%	4
ADHD	6%	4

*Table 3**Average ACE scores per reported diagnosis*

<i>Diagnosis</i>	<i>Average Ace Score</i>
PTSD	10.4
Substance Abuse	7.2
Depression	6
Anxiety	5.4
Bipolar	5.2
Chronic Pain	4.9
Chronic Respiratory	4.9
ADHD	4.8
Diabetes	4.3
Obesity	4.1
Cardiovascular	3.6
Arthritis	3.2
No reported disease	1.8

Subjects were asked if they were currently receiving psychological counseling. Of the 71 subjects, 54 (76%) reported they were not receiving psychological counseling and 17 (24%) reported that they were receiving psychological counseling. Patients were also asked to self-report how many visits they had at the practice in the last year. The subjects reported a range of visits from 0 – 200 visits over the last year, with a mean of 9.2 office visits in the last year.

Following the patient interview, information was collected regarding the interview process. The interviewers were asked to rate their comfort level during the ACE intervention as

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well as how secure they felt about the knowledge and ability to screen for ACE. The interviewers reported they felt somewhat comfortable and knowledgeable during the interview for ACE screening 20% of the time, and very comfortable or very confident during the interviews 80% of the time. There was no incidence in which the interviewer reported feeling uncomfortable or insecure.

Interviewers were then asked to record the length of time it took with each interview. The interviews ranged from 3 to 30 minutes with the average screening time of 8.5 minutes. When asked if they felt the screening visit took longer than expected, the interviewers responded that 11% of the screening interviews took longer than anticipated, and 89% took no longer than expected.

Correlational data analysis was conducted to evaluate correlations between number of visits per year, ACE score, provider comfort in screening, provider security in screening, and time used to perform screening SBIRT process. The results demonstrated that there was a positive correlation between provider security about knowledge and ability to screen for ACE and provider's comfort level during the ACE intervention ( $r=0.438.$ ) ( $p=.000$ ). Providers that were more secure in their knowledge and ability to screen were more comfortable with screening for ACE. A positive correlation was found between ACE score and length of time for screening ( $r=0.445$ ) ( $p=0.000$ ). Thus, interviews with higher ACE scores took more time. The final correlation showed a negative correlation between time to screen for ACE and provider comfort. This demonstrated that as providers became more comfortable with screening, the time for screening became shorter.

Table 4

Descriptive Statistics

	Mean	Std. Deviation	N
#Visits yr.	9.246	23.3573	71
ACE	4.66	3.909	71
Provider Comfort	3.803	.4007	71
Provider Security	3.831	.3774	71
Time	8.479	3.7066	71

Table 5  
Correlations

		#Visits yr.	ACE	Provider Comfort	Provider Security	Time
#Visits yr.	Pearson Correlation	-				
	Sig. (2-tailed)					
	N	71				
ACE	Pearson Correlation	.179	-			
	Sig. (2-tailed)	.136				
	N	71	71			
Provider Comfort	Pearson Correlation	.079	-.180	-		
	Sig. (2-tailed)	.511	.133			
	N	71	71	71		
Provider Security	Pearson Correlation	.030	-.146	<b>.438**</b>	-	
	Sig. (2-tailed)	.804	.225	<b>.000</b>		
	N	71	71	71	71	
Time	Pearson Correlation	.131	<b>.445**</b>	<b>-.339**</b>	-.094	-
	Sig. (2-tailed)	.278	<b>.000</b>	<b>.004</b>	.433	
	N	71	<b>71</b>	<b>71</b>	71	71

\*\* . Correlation is significant at the 0.01 level (2-tailed).

In addition to the quantitative information gathered, a considerable amount of information was collected and recorded from individual subject interviews. Many variations of domestic violence, physical and emotional abuse, neglect, and feelings of abandonment were described to the interviews during their survey. In addition, interviewer comments were recorded that included observations of patient reactions to sharing their ACEs as well as descriptions of patients affect and response to the ACE interventions and their thoughts regarding the screening process.

### **Limitations**

Identified limitations include the limited diversity of subjects. All the subjects were of a Caucasian descent and nearly two thirds of the subjects were females, limiting generalizability of the results. Another limitation was that many of the patients that belong to this practice see the provider for both medical and mental health care based on her advanced dual credentials. The interviews for this study were nurse practitioner students, this may offer a different perspective than utilizing practicing advanced practice providers with a known professional and established relationships with the patients. The final limitation is that the demographics from patients were self-reported. Confirmation of this information from the medical record would have increased reliability in the findings. Additional information regarding patient individual verbal responses were not systematically analyzed for this project, however provided some valuable information about the lack of insight patients had about their past ACE and their current chronic disease. More structured data collection and analysis of these responses could help in future researcher to identify strategies that might improve patient recognition of the impact of ACE on their current health.

### Discussion

The patients interviewed in this research translation project provided insight into the prevalence of ACE and the feasibility of a brief interview screening for assessing ACE in patients in an adult primary care clinic. NP student interviewers generally felt very comfortable performing the SBIRT interview, as well as felt knowledgeable about ACE and their ability to screen patients. Overall, the interviewers were not time intensive, as NPs in previous studies believed they would be. We confirmed that higher ACE scores were associated with chronic diseases such as PTSD, substance abuse, depression, anxiety, bipolar, chronic disease, chronic respiratory disease, ADHD, diabetes, obesity, cardiovascular disease, and arthritis in this population. Indeed, patients with no reported disease had much lower incidence of ACEs. In our project, we found support for research that indicates high ACEs are associated with negative health outcomes, and are linked with physical, mental, and developmental disruption. Future studies in primary care should include a broader range of chronic disease incidence in patients with reported ACE to better understand the impact of ACE on chronic disease.

Patients with histories of ACE did report frequent visits with their PCP which also validated research evidence that ACEs were associated with increased healthcare utilization. There was little information on health-risk behaviors, which could be included in future studies to better understand issues surrounding compliance and risk factors for diseases or impact of ACE.

Despite the significant percentage of patients with positive ACE reports and self-reported chronic disease, there was a very low percentage of patients receiving psychological counseling. Through this brief screening intervention project, patients were referred to counseling to evaluate the effect of ACE on their current health and establish strategies to begin recovering from the

long-term effects of ACE.

Many patients during the interviews also provided narrative information that described a lack of insight into how ACE and chronic disease were related. Lack of screening in this population and the significant reports of ACE supported the concern for lost opportunities to identify ACEs and their impact in chronic disease in this primary care setting.

Considerations for future providers should include the ability of nurse practitioners to impact patients that have reported ACEs that have developed chronic diseases. Utilizing motivational interviewing to help patients better understand the connection between ACE and chronic disease is imperative. Establishing therapeutic communication between nurse practitioners and patients regarding ACE may help to enhance patient education regarding trauma and how it has affected them. Resiliency from these traumatic events is possible once patients can recognize and understand what has happened, how it has affected them, and what resources are available to help them recover. A patient education handout will be created as part of this project to further assist patients in this population to increase awareness of ACE and the relationship with development of chronic disease.

### **Conclusion**

ACE contributes towards negative health outcomes and is contributing to the development and exacerbation of chronic diseases. It is theorized that by implementing nurse practitioner screening in the primary setting, using a brief motivational interview screening protocol, and appropriate referral to services, that patients will receive true patient-centered care that will result in improvements in their health and wellness. Despite the overwhelming evidence that ACE affect health, and that screening is needed, regular ACE screening is not currently performed. This DNP project translated research evidence about the effect of ACE on chronic

health to a primary care practice. Nurse practitioners should screen for ACE in primary care, particularly among adults with chronic disease. NP education should also focus on the importance of screening ACE in adult primary care settings.

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## Appendix I

Screening for ACE among adult primary care patients

A. Who to screen?

1. Patients with the following health problems should be screened for ACE:

- Obesity (current or past history)
- GI complaints
- Chronic diseases not well managed, or patient appears to be non-compliant with self-management
- PTSD
- Anxiety
- Depression
- Substance abuse disorder (includes alcohol, illicit drugs)

2. Patients in high-risk settings such as homeless shelters, women's shelters.

3. Patients with high health care utilization (Multiple complaints, 3 or more visits in 6 months).

B. How to screen.

We recommend a three-phase approach to screening:

Phase 1 – provide information about why we are screening:

*We know that childhood experiences may have a long-term effect on adult health*

Phase 2 – ask about childhood adversity in a clear, concise, non-judgmental manner:

*Did you experience hardship or abuse when you were a child? (e.g., living in poverty, living with a family who abused substances, physical, psychological abuse, and or neglect)*

Phase 3 – Respond with compassion.

*I am sorry/sad this happened to you. How do you think this has affected your health? What can I do to help you? (Example; referral to counseling, schedule a follow-up visit, be available as needed in the future, etc.)*

*You may want to use follow-up questions if the patient responds yes, but seems hesitant to talk about their childhood (e.g., Tell me more about your experiences. If you feel comfortable sharing your experiences, I am ready listen.*

*If the patient reports no childhood hardships or abuse, use the following response: Thank you for answering.*

Appendix II

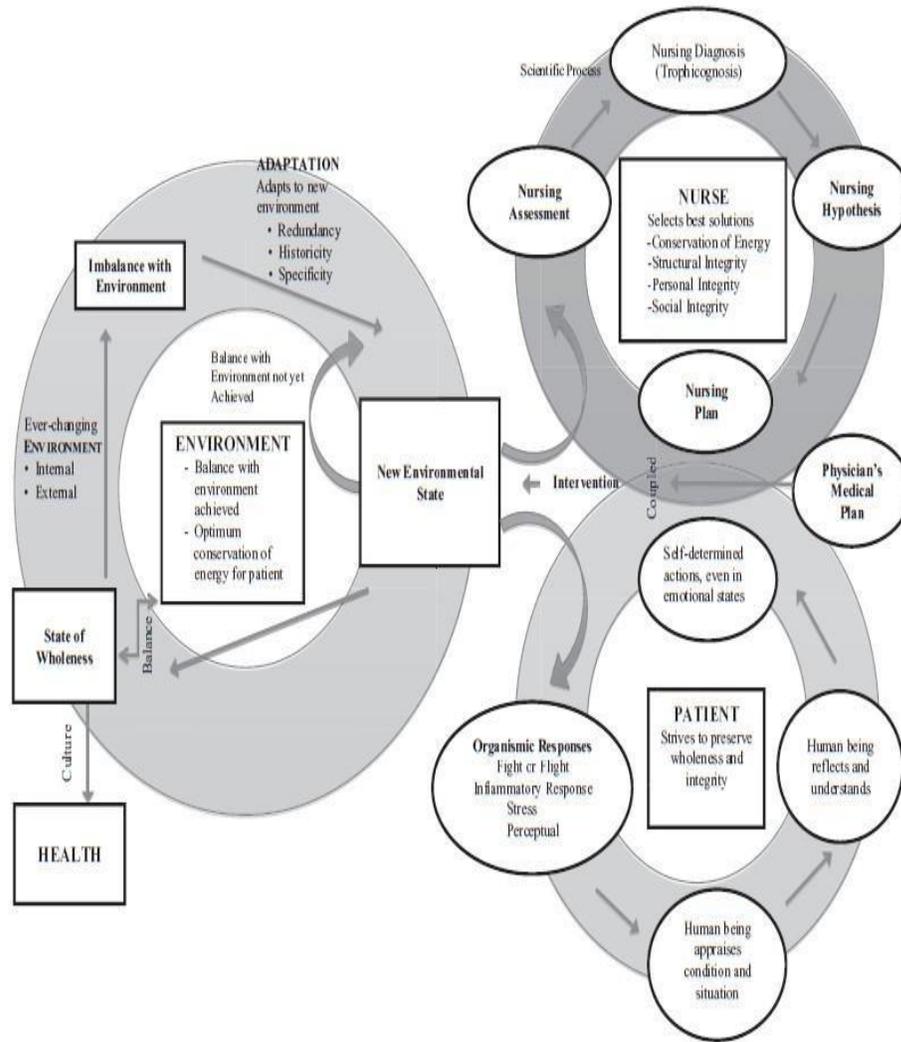
**Demographics Questionnaire**

1. Patient age: \_\_\_\_\_
2. Patient gender (circle one):    Male    Female    Transgendered
3. Patient race (circle one):
  - a. Black or African American
  - b. White or European
  - c. American Indian
  - d. Asian
  - e. Native Hawaiian or Pacific Islander
  - f. Middle Eastern/Arabic
  - g. Other (please describe): \_\_\_\_\_
4. Patient ethnicity (circle one):
  - a. Hispanic or Latino
  - b. Not Hispanic or Latino
5. Patient marital status (circle one):
  - a. Single
  - b. Married
  - c. Living with partner
  - d. Separated
  - e. Divorced
  - f. Widowed
  - g. Other (please describe): \_\_\_\_\_
6. Patient occupation \_\_\_\_\_
7. Months/years patient of the practice/clinic \_\_\_\_\_
8. Number of visits in past year \_\_\_\_\_
9. Diagnosis
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
  4. \_\_\_\_\_
10. Currently receiving psychological counseling?  
Yes      No

Appendix III

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Figure 1. Levine's Traditional Conservation Model



## Appendix IV

Table 6

*Studies supporting continued association of ACE and negative health outcomes.  
2014-2016*

First Author	Year	Sample	Health Outcome
Campbell	2016	48,526	Risk behaviors, morbidity, and disability
Chen	2014	20	Psychological and genetic alterations to telomeres
Crosswell	2014	152	Pro-inflammatory response
Curran	2016	34,653	Psychological/mental health
Davis	2014	215	Metabolic syndrome
Ege	2014	8051	Depression
Garcia	2015	805	Mental health implications
Gjelsvik	2014	81,910	Poor quality of life
Levine	2015	200	Pro-inflammatory response and genetic changes
McCauley	2015	36,485	Smoking and permanent disability
McCrory	2015	8,175	Cardiovascular disease, lung disease, asthma, psychological disorders
Rudenstine	2015	991	PTSD
Schaakxs	2015	510	Psychosocial stress
Sun	2016	1255	Depression and food insecurity

## Appendix V

*Table 7**Use of motivational interviewing in primary care*

First Author	Year	Method	Health Impact
Benzo	2013	RCT	Patients found value in MI strategies with management of their chronic disease.
Bishop	2013	Informational/Opinion	MI helps patients explore their own motivation for change. NPs have the potential to implement this practice to help change behaviors and prevent chronic disease.
Coyne	2014	Case Reviews	Motivational interviewing can be beneficial if providers are properly trained and given the time to implement it
Purath	2014	Systematic Review	Motivational interviews may be effective when addressing health promotion and disease prevention in adult primary care settings. Clients' needs are the priority which is difficult to measure.

## Appendix VI

*Table 8**Use of SBIRT in primary care*

First Author	Year	Method	Health Impact
Agerwala	2012	Systematic review	Used a standardized tool, trained staff, and implemented SBIRT in primary care and reduced substance abuse.
Dunn	2014	RCT	SBIRT has been limited due to clinical priorities, lack of time, or lack of motivation. NPs may have the training and skills to implement it successfully in primary care.
Kaiser	2015	Qualitative study	Universal prescreening, brief intervention, and referral to treatment had positive effects in an outpatient setting for substance abuse.
Moyer	2013	Systematic Review	SBIRT shown to improve behavioral health with cognitive strategies, plans, stress, management, and problem solving in primary care with brief face to face interventions
Reho	2016	Systematic Review	SBIRT utilizing screening and MI helped reduce drug use