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Association Between Childhood Exposure to Family Substance Abuse, Mental Health Issues, and Cervical Screening Among Women Ages 18-65 in South Carolina

Ashley Laine Hamm
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Walden University

College of Health Sciences and Public Policy

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Ashley L. Hamm

has been found to be complete and satisfactory in all respects,
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Walden University

2026

Abstract

Association Between Childhood Exposure to Family Substance Abuse, Mental Health
Issues, and Cervical Screening Among Women Ages 18-65 in South Carolina

by

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MPH, University of South Carolina, 2019

BS, University of South Carolina Beaufort, 2016

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Doctoral Study Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Public Health

Walden University

April 2026

Abstract

Adverse childhood experiences (ACEs) have been associated with adverse health outcomes in adulthood; however, less is known about their relationship with preventive health behaviors such as cervical cancer screening. The purpose of this quantitative, correlational study was to examine associations between selected ACEs and cervical cancer screening among women aged 18–65 in South Carolina. Data were drawn from the 2020 South Carolina Behavioral Risk Factor Surveillance System (BRFSS) and included 1,323 women. Binary logistic regression analyses were used to examine unadjusted and adjusted associations between ACE exposures and being up to date with Pap testing, controlling for age, race/ethnicity, income, and education. Most women were up to date with screening. In unadjusted analyses, all three ACE exposures—living with a problem drinker or alcoholic, living with someone who used illegal drugs, and living with a household member with mental illness—were significantly associated with Pap test utilization. In adjusted models, living with someone who used illegal drugs was associated with higher odds of screening ($AOR = 1.64$, 95% $CI [1.58, 1.70]$, $p < .001$), while living with a problem drinker or alcoholic ($AOR = 0.95$, 95% $CI [0.92, 0.98]$, $p < .001$) and living with a household member with mental illness ($AOR = 0.71$, 95% $CI [0.69, 0.73]$, $p < .001$) were associated with lower odds. Results indicate that ACEs were differentially associated with cervical cancer screening, underscoring a complex relationship and the importance of trauma-informed preventive healthcare. This study has the potential to improve screening uptake and reduce health disparities through trauma-informed public health approaches.

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Dedication

This dissertation is dedicated to my son, Darby. Your resilience, curiosity, and strength have been a constant source of motivation throughout this journey. You have grown up alongside my academic pursuits, and your patience, encouragement, and humor have meant more to me than you know. Watching you grow while I worked toward this goal has been one of the greatest privileges of my life. While it was not an easy journey, I hope you will always remember that you can do hard things and that perseverance, courage, and belief in yourself will carry you further than you ever imagined.

I also dedicate this work to my parents, whose unwavering support and belief in the value of education shaped the foundation of my life. From an early age, you instilled in me the importance of curiosity, perseverance, and lifelong learning. Your encouragement made it possible for me to pursue my goals with confidence, and I am deeply grateful for the opportunities and values you provided. I know. I am. I will. This achievement is as much yours as it is mine.

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I would like to express my deepest gratitude to my mentor, Dr. Lauren Gellar. I first met Dr. Gellar in 2014 when she served as my professor and advisor in the Bachelor of Science in Health Promotion, Education, and Behavior program at the University of South Carolina Beaufort. Since that time, she has remained a steadfast mentor and guide throughout my public health journey. Her encouragement, insight, and unwavering support helped shape my academic and professional path. When she later joined the Medical University of South Carolina and invited me to teach as an adjunct instructor, she opened a door that profoundly influenced my career. I am deeply grateful for her mentorship and for the many opportunities she has provided.

I would also like to acknowledge the faculty and committee members who supported this work and provided thoughtful feedback throughout the dissertation process. Their expertise and guidance strengthened this study and contributed to its completion.

Finally, I would like to recognize my former colleagues at the Child Abuse Prevention Association in Beaufort, South Carolina, where I was first introduced to the concept of adverse childhood experiences (ACEs). That experience sparked my interest in trauma-informed public health and ultimately shaped the focus of this research. Without that early exposure and the important work being done in that space, this dissertation would not have been possible.

Table of Contents

List of Tables	v
List of Figures	vi
Section 1: Foundation of the Study and Literature Review	1
Introduction.....	1
Problem Statement.....	3
Purpose of Study.....	4
Research Questions and Hypotheses	5
Theoretical Framework.....	7
Nature of the Study.....	9
Literature Search Strategy.....	10
Literature Review Related to Key Variables and/or Concepts	10
Defining Adverse Childhood Experiences.....	10
ACEs and Toxic Stress	12
ACE Impact on Mental Health	15
ACE Impact on Substance Abuse.....	17
ACE and Cervical Cancer Screening.....	19
Cervical Cancer Initiatives in South Carolina	22
Gap in the Literature	23
Prior Studies Using the Chosen Methodology.....	23
Definitions.....	27
Assumptions.....	28

Scope and Delimitations	28
Limitations	29
Significance.....	29
Summary and Conclusions	30
Section 2: Research Design and Data Collection	32
Introduction.....	32
Research Design and Rationale	33
Methodology	35
Data Sampling.....	35
Population	35
Operationalization for Each Variable	36
Data Analysis Plan.....	37
Data Preparation.....	37
Data Cleaning.....	37
Binary Logistic Regression.....	38
Threats to Validity	39
Ethical Procedures	39
Summary	39
Section 3: Presentation of the Results and Findings.....	41
Introduction.....	41
Accessing the Data Set for Secondary Analysis	42
Study Sample	44

Statistical Assumptions.....	44
Logistic Regression Research Questions & Findings.....	45
Research Question 1	47
Research Question 2	47
Research Question 3	48
Research Question 4	48
Research Question 5	48
Research Question 6	49
Summary.....	49
 Section 4: Application to Professional Practice and Implications for Social	
Change	54
Introduction.....	54
Interpretation of Findings	55
Implications for Social Change.....	55
Public Health Implications.....	56
Clinical Practice Implications	57
Limitations of the Study.....	57
Recommendations.....	58
Recommendations for Public Health Practice	58
Recommendations for Clinical Practice.....	59
Recommendations for Health Policy	59
Field-Based Products	60

Policy Implications	60
Implications for Future Research.....	61
Conclusion	63
References.....	65
Appendix A: Policy Brief Memo.....	72
Appendix B: “Safe to Screen”: A Trauma-Informed Community Intervention to Increase Cervical Cancer Screening Among Women with ACE Exposure in South Carolina	75
Appendix C: Trauma-Informed Framework for Improving Cervical Cancer Screening Engagement.....	84
Appendix D: Community Fact Sheet / Informational Sheet (Target Audience)	85

List of Tables

Table 1. Adjusted Logistic Regression Predicting Up-to-Date Pap Testing Among Women by ACE Exposure.....	46
Table 2. Weighted Sample Characteristics of South Carolina Women Ages 18–65, BRFSS 2020.....	51
Table 3. Unadjusted Logistic Regression of ACE Exposures and Pap Test Screening, South Carolina Women Ages 18–65.....	52
Table 4. Adjusted Logistic Regression of ACE Exposures and Pap Test Screening, Adjusted for Age, Race, Income, and Education.....	52
Table 5. Multicollinearity Diagnostics for Independent Variables in Adjusted Logistic Regression.....	53

List of Figures

Figure 1. Empower Action Model	7
Figure 2. Socioecological Model	8
Figure 3. Protective Factors Against ACEs	9
Figure 4. Correlational Versus Experimental Research.....	34
Figure 5. Pap Test Screening (Within Past 3 Years) by ACE Exposures Among Women Ages 18–65 in South Carolina, BRFSS 2020	53

Section 1: Foundation of the Study and Literature Review

Introduction

ACEs are defined by the Centers for Disease Control and Prevention (2024) as potentially traumatic events that occur during the first 17 years of life. Such events include experiencing physical, sexual, or emotional abuse, experiencing physical or emotional neglect, living with a family member with mental illness or substance abuse issues, or instability due to parental separation or parental incarceration. Felitti et al. (1998) published a landmark study showing a graded dose-response relationship between the number of ACEs and numerous health conditions. For example, a person who experienced four or more ACEs may be at an exponentially increased risk for cancer, suicide, engaging in risky health behaviors, heart disease, and stroke.

Cervical cancer is a type of cancer in which the cells within the cervix grow uncontrollably. According to the Centers for Disease Control and Prevention (2021), cervical cancer most often occurs in women over the age of 30 years and is most often caused by the human papilloma virus (HPV), a sexually transmitted infection. While approximately 50% of sexually active persons will contract HPV at some point in their lives, only a minority will develop cervical cancer. In 2021, there were 12,536 new cases of cervical cancer in the United States (U.S. Cancer Statistics Working Group, 2024). Data from 2022 indicates that there were 4,051 cervical cancer deaths in the United States. In South Carolina, 192 new cases of cervical cancer were reported in 2021; in 2022, 74 cervical cancer deaths were reported in the state.

This research study was conducted to increase awareness of ACEs and their impact on cervical cancer screening behaviors among women in South Carolina. This study provides insight into how early childhood trauma and toxic stress across the lifespan may influence cervical cancer screening behaviors. This study will contribute to the field of public health by examining two specific ACEs, exposure to substance abuse and living with a family member with mental health issues, in women aged 18-65 who receive cervical cancer screenings in South Carolina. Currently, work being done in South Carolina through the Best Chance Network (BCN) program, which seeks to provide cervical screenings at no cost to women who are uninsured/underinsured, finds that cervical cancer screenings among this population remain low.

While many barriers, such as transportation and access, have been explored, no such exploration has focused on ACEs. National accreditation programs, such as the Patient-Centered Medical Home Recognition Program through the National Council on Quality Assurance, have begun requiring primary care practices to record patients' social determinants of health, which includes family history of alcohol and/or drug abuse and living with a family member with mental health issues. Understanding the relationship between these two SDOHs and cervical cancer screening rates may help identify barriers to screening in South Carolina and inform future efforts to address-them. This study can lead to positive social change through results that can encourage improved cervical screening uptake and promoting women's overall health, while also promoting trauma-informed care.

Section 1 will include the problem statement, the purpose of the study, research questions and hypotheses, the theoretical framework, the nature of the study, the literature review related to key variables, definitions, limitations, the significance of the research, and the summary and conclusion.

Problem Statement

There are over two decades of research supporting the correlation between elevated ACE scores and increased chronic disease later in life (Zarse et al., 2019). An important antidote to the increased risk of adverse health conditions is regular preventive health care; however, there are many barriers to health care access in South Carolina. Current work being done in the BCN program in South Carolina, which seeks to increase cervical cancer screening rates among underinsured/uninsured women, notes that cervical cancer screenings are exceptionally low. But trauma history has not been widely considered as a potential barrier to accessing this and other no-cost preventive services.

The specific research problem is two-fold. First, there is minimal research regarding ACEs and cervical cancer screening, both jointly and independently, among women in South Carolina. Second, the literature review confirms a lack of research that focuses on the impact of family mental illness and family substance abuse and their effects on cervical cancer screening among women. This study was conducted to identify any statistically significant relationships between two specific ACEs, living with a family member with mental health issues (a family member who was depressed, mentally ill, or suicidal) and exposure to substance abuse (problem drinker, alcoholic, illegal street drugs, or abused prescription medications) while controlling for race/ethnicity and

income level that a woman has self-reported and whether or not she receives cervical cancer screenings in South Carolina.

Purpose of Study

The purpose of this quantitative study was to examine the relationship between childhood exposure to substance abuse and living with a family member with mental health issues, and cervical cancer screening uptake among women ages 18-65 in South Carolina using descriptive and regression analyses. This correlational study design helped control for race/ethnicity and income level.

This study required access to South Carolina BRFSS data from the Centers for Disease Control and Prevention (CDC). ACE questions are asked as additional modules in the South Carolina BRFSS. All the data can be accessed via CDC and the South Carolina Department of Health. I have confirmed access to the dataset per CDC policy and that it contains all the variables of interest for this study. Data were drawn from self-reported ACEs from women ages 18-65 in South Carolina and women in South Carolina who receive cervical cancer screening, as provided by the South Carolina BRFSS dataset. The variables of interest are as follows:

- Independent variables (IV): Self-reported ACE of family mental illness and/or family substance abuse
- Dependent variables (DV): Cervical cancer screening behavior
- Control variables (CV): Race/ethnicity and income level

Research Questions and Hypotheses

RQ 1: What is the relationship between childhood exposure to substance abuse and cervical cancer screening among women ages 18-65 in South Carolina while controlling for race/ethnicity?

H₁₁: There is a statistically significant relationship between childhood exposure to substance abuse and cervical cancer screening among women ages 18-65 in South Carolina, while controlling for race/ethnicity.

H₀₁: There is no statistically significant relationship between childhood exposure to substance abuse and cervical cancer screening among women ages 18-65 in South Carolina, while controlling for race/ethnicity.

RQ 2: What is the relationship between living with a family member with mental health issues and cervical cancer screening among women ages 18-65 in South Carolina while controlling for race/ethnicity?

H₁₂: There is a statistically significant relationship between living with a family member with mental health issues and cervical cancer screening among women ages 18-65 in South Carolina, while controlling for race/ethnicity.

H₀₂: There is no statistically significant relationship between living with a family member with mental health issues and cervical cancer screening among women ages 18-65 in South Carolina, while controlling for race/ethnicity.

RQ 3: To what extent does childhood exposure to substance abuse predict cervical cancer screening among women aged 18-65 in South Carolina while controlling for race/ethnicity?

H₁₃: Childhood exposure to substance abuse is a significant predictor of cervical cancer screening among women aged 18-65 in South Carolina.

H₀₃: Childhood exposure to substance abuse is not a significant predictor of cervical cancer screening among women aged 18-65 in South Carolina.

RQ 4: To what extent does living with a family member with mental health issues predict cervical cancer screening among women aged 18-65 in South Carolina while controlling for race/ethnicity?

H₁₄: Living with a family member with mental illness is a significant predictor of cervical cancer screening among women aged 18-65 in South Carolina.

H₀₄: Living with a family member with mental illness is not a significant predictor of cervical cancer screening among women aged 18-65 in South Carolina

RQ 5: To what extent does living with a family member who used illegal drugs predict cervical cancer screening among women aged 18-65 in South Carolina, while controlling for race/ethnicity, income level, and education?

H₁₅: Living with a family member who used illegal drugs is a significant predictor of cervical cancer screening among women aged 18-65 in South Carolina.

H₀₅: Living with a family member who used illegal drugs is not a significant predictor of cervical cancer screening among women aged 18-65 in South Carolina.

RQ 6: To what extent does living with a family member with mental health issues predict cervical cancer screening among women aged 18-65 in South Carolina while controlling for race/ethnicity, income level, and education?

H_{16} : Living with a family member with mental health issues is a significant predictor of cervical cancer screening among women aged 18-65 in South Carolina.

H_{06} : Living with a family member with mental health issues is not a significant predictor of cervical cancer screening among women aged 18-65 in South Carolina.

Theoretical Framework

The Empower Action Model (EAM) served as the theoretical framework for this study (Srivastav et al., 2020). The model integrates concepts from the socioecological model (SEM) and the Protective Factors Framework to illustrate how adverse childhood experiences can be prevented through multi-level interventions. The EAM is presented in Figure 1. The EAM seeks to fill gaps in the Protective Factors Framework, described in Figure 3. The EAM provides tangible steps to prevent ACEs by implementing protective factors to build resiliency and promote health equity across the lifespan, rather than just focusing on childhood. Similar to the SEM, the EAM addresses multiple levels to affect change from the individual to health policy.

Figure 1

Empower Action Model



Note. From “The Empower Action Model: A Framework for ACE Prevention,” by Srivastav, A., Strompolis, M., Moseley, A., Daniels, K., 2020, *Journal of Public Health Management and Practice*, 26(6), p. 528.

<https://doi.org/10.1097/PHH.0000000000001202>

The socioecological model (SEM) provides a multilevel approach to understanding health behaviors and outcomes across individual, interpersonal, community, and policy levels. The SEM framework is illustrated in Figure 2. First, at the personal level, the study sought ways to improve cervical cancer screening behaviors. At the organizational level, interventions could be implemented to educate healthcare providers about ACEs and their impacts on health, as well as how they may serve as barriers to preventive care. At the community level, increased awareness of ACEs could benefit the greater population.

Figure 2

Socioecological Model



Note. From “About Violence Prevention,” by Centers for Disease Control and Prevention (2025). <https://www.cdc.gov/violence-prevention/about/index.htm>

The Protective Factors Framework illustrates how the long-term impacts of ACEs can be mitigated through supportive relationships, safe environments, and healthy social and emotional development. The framework is shown in Figure 3. While the framework does promote resiliency against ACEs, it does not promote resiliency throughout the lifespan, as the EAM does.

Figure 3

Protective Factors Against ACEs



Note. From One Place (2022). “Bringing the Five Protective Factors to Life.”

(<https://www.oneplaceonslow.org/blog/bringing-the-five-protective-factors-to-life/>)

Nature of the Study

This quantitative correlational study is a secondary analysis using data from the BRFSS database. I conducted both descriptive and inferential statistical analysis, including binary logistic regression for this quantitative study. The descriptive analysis consists of identifying the distributions of selected characteristics among different age ranges, self-reported ACEs, races and ethnicities in regard to cervical cancer screening behaviors in South Carolina. This correlational study examined the associations between

exposure to family substance abuse and family mental health issues and cervical cancer screening among women ages 18-65 in South Carolina, while controlling for race/ethnicity and income level.

Literature Search Strategy

To build my literature review, I searched several databases to obtain relevant articles: Google Scholar, PubMed, and the Walden University OASIS Library. I selected these databases for ease of use and accessibility to peer-reviewed articles. I used the following search terms to narrow the focus of my literature search: *adverse childhood experiences (ACEs)*, *cervical cancer screening*, *pap screen*, *pap*, *early trauma*, *family mental health*, *family mental illness*, *substance abuse*, *family substance abuse*, and *exposure to mental illness*.

Literature Review Related to Key Variables and/or Concepts

Defining Adverse Childhood Experiences

ACEs are a class of potentially traumatic events that occur during the first 18 years of life. While over two decades of literature currently exist, examining multiple health impacts of ACEs (Zarse et al., 2019), the foundational ACE study set the tone for future research by confirming a strong dose-response relationship between the number of self-reported ACEs and multiple risk factors for adverse health conditions, particularly chronic disease (Felitti et al., 1998). This study found that more than half of respondents ($n = 13,494$) reported at least one ACE, and one-fourth of respondents reported at least two ACEs. The 17-question survey asked questions about childhood exposure to a number of potentially traumatic events, all of which were categorized into questions

about child abuse (physical, abuse, psychological abuse, and contact sexual abuse), exposure to household dysfunction during childhood (exposure to substance abuse, mental illness, violent treatment of mother or stepmother, and criminal behavior in the household). The survey was scored based on the number of “yes” responses to each question; for each “yes” response, one point was assigned. The total number of points at the end of the survey was the respondent’s ACE score. Cancer, not specified, was included in the authors’ list of chronic conditions that resulted from the dose-response relationship; other conditions included ischemic heart disease, chronic bronchitis or emphysema, history of hepatitis or jaundice, skeletal fractures, and poor self-rated health.

One of the most significant findings from this study, as well as the breadth of literature that currently exists, is that there is a strong dose-response relationship between the number of ACEs and individual reports and increased risk for an array of adverse health conditions. This dose-response relationship is demonstrated in a variety of adverse health conditions and behaviors. Zarse et al. (2018) reviewed 134 articles that demonstrated a consistent dose-response relationship between ACEs and an array of mental illnesses, addictions, and multi-organ diseases.

Felitti et al. (1998) spawned a wealth of subsequent research that explored the interrelationships between various forms of abuse (Edwards et al., 2003; Flaherty et al., 2009; Thompson et al., 2014). One study surveyed 8,629 adults (Dong et al., 2004), 81% who reported at least one type of maltreatment as well as an additional ACE. Multiple studies note that an increased risk of experiencing at least one other ACE when specifically focusing on childhood sexual trauma (Dong et al., 2003; Easton, 2012) and

witnessing domestic violence (Dube et al., 2002). These studies are not limited to the United States but rather are conducted globally across Europe and Asia (Matsuura et al., 2009; Ramiro et al., 2010). Focusing on subpopulations, the highest ACEs were reported among gay, lesbian, and bisexual populations in comparison to heterosexual populations (Andersen & Blosnich, 2013). Additionally, the literature found that women report higher numbers of ACEs, including specifically child sexual abuse; however, men and women were found to report similar rates of child physical abuse (Anda, 1999; Dube et al., 2001, 2002, 2003, 2005, 2006; Edwards et al., 2007).

Using the ACE Questionnaire as a predictor of adverse health conditions or behaviors is consistently supported in the literature, particularly in regard to mental health, substance use disorders, and general medical/somatic conditions (Zarse et al., 2018). The literature identifies 52%-75% of all adults have experienced at least one ACE (Anda, 1999; Centers for Disease Control and Prevention, 2010; Dube et al., 2002, 2003, 2006; Edwards et al., 2007; Ford et al., 2011; Ramiro et al., 2010; Rothman et al., 2010). In contrast, only 5%-10% of adults report four or more ACEs, increasing the likelihood for the most severe and pronounced long-term health consequences (Felitti et al., 1998; Hughes et al., 2017).

ACEs and Toxic Stress

To fully understand the impact of ACEs on individual health, it is important to understand the concept and impact of toxic stress and how this acts as a conduct for adverse health conditions. Considering genetic, social, and biological factors, childhood adversity appears to act as a stressor. When protective factors, such as supportive

caregivers, are absent, toxic stress caused by prolonged, frequent, and/or severe adverse experiences can dysregulate the body's natural stress response (Bucci et al., 2016).

The stress response exists on a spectrum, including positive, tolerable, and toxic stress, and this spectrum-underlies the physiological response to stress (Bucci et al., 2016). Positive stress may include a playoff game or taking an exam. These activities trigger a brief activation of the stress response elevating heart rate, blood pressure, and hormone levels; however, the body quickly returns to homeostasis. Tolerable stress, such as a natural disaster, is an adaptive response to a finite stressor, with homeostasis reached through the buffering effect of interventions and/or social support. Toxic stress is a maladaptive response to such experiences as abuse, neglect, or other household dysfunction. Toxic stress incites a prolonged stress response in children and disrupts important brain development, as well as increasing risk of adverse health conditions. Homeostasis is extremely difficult to maintain, so the body remains stuck in the stress response, with heart rate, blood pressure, and hormone levels remaining elevated longer than is healthy (Bucci et al., 2016).

The stress response involves both the central nervous system (CNS): the amygdala, hypothalamus, and parts of the brain stem known as the locus coeruleus in the pons and the medulla; and the peripheral nervous system (PNS): the sympatho-adrenomedullary (SAM) axis and the hypothalamic-pituitary-adrenal (HPA) axis. The SAM axis mediates a rapid response to stress through interconnected neurons and regulates autonomic functions in multiple organs systems. The HPA axis controls the body's response to stress and is an intricate collaboration of direct interactions. In

response to stress, both axes are activated. The trigger stressor activates the amygdala, which detects and signals threats to survival (LeDoux, 2000). Central structures known as the hippocampus (learning and memory), prefrontal cortex (executive function), and locus coeruleus in the pons (mediating autonomic effects during stress response) mediate the activation of the amygdala (McEwen, 2007).

Activation of the SAM axis triggers the release of norepinephrine (noradrenaline) and epinephrine (adrenaline). When this occurs, the body undergoes several adaptive changes that are designed to increase survival for the individual when faced with a threat. Blood vessels constrict to push blood to the brain, muscles, heart, and other vital organs, resulting in an increase in heart rate, blood pressure, muscle tone, and alertness. There is an increase in respiratory rate and dilation of the smaller airways in the lungs to increase oxygen intake to the brain and stressed organ systems. Lastly, an intermediate metabolic pathway, known as gluconeogenesis and lipolysis, occurs to release stored glucose and fat to be used as energy in order to fight or flee from the threat (Haggerty et al., 1996; Herd, 1991).

The stress response is meant to last for a limited duration. When the stress response is dysregulated, an excess of the stress hormone, cortisol, is released, in addition to norepinephrine and epinephrine (Chrousos, 1997; Habib et al., 2001; Tsigos & Chrousos, 2002). In childhood, the brain is developing and is highly plastic—that is, it is highly moldable and influenced by environmental factors. When a child experiences a dysregulated stress response, the brain structure is altered, and the nervous, endocrine, and immune systems are all negatively impacted. Prolonged, frequent, and/or severe toxic

stress can reduce the mediation power of areas of the CNS. When these important systems are altered, the risk for the individual developing chronic health issues is increased (Tarullo & Gunnar, 2006). Altered functioning of these systems as the result of a toxic stress response can impact multiple organ systems. In adults, such changes have been linked to an increased risk of developing chronic diseases, such as metabolic syndrome, cardiovascular disease, allergies, inflammatory diseases, and autoimmune diseases, as well as cognitive, mental, and behavioral disorders (Bucci et al., 2016).

ACE Impact on Mental Health

The graded dose-response relationship between ACEs and impact on mental health has been demonstrated in a variety of ways through interpersonal conflict, emotional distress, work performance, financial instability, family problems, high levels of stress, and inability to control anger (Anda et al., 2004; Hillis et al., 2004; Nirius, Logan-Greene, & Green, 2012; Ramiro et al., 2010). One of the most significant findings in the literature regarding ACEs and mental health is that the impact is long-lasting, and that people do not “get over it” or “age out” of the effects. Adults aged 65 and older with higher ACEs have increased risk for mood and personality disorders (Raposo, MacKenzie, Henriksen, & Afifi, 2014). Of course, interventions do exist that may increase resilience and protective factors and minimize the impact of ACEs (Whitaker et al., 2014).

ACEs and the risk of psychiatric illness were identified by examining the rate of prescribed psychiatric medications among 15,000 adults (Anda et al., 2007). This study was conducted over a period of seven years and demonstrated an annual increase in

psychotropic medication prescriptions in a graded fashion as ACE scores increased. For example, an ACE score above 5 was associated with an increased likelihood of being prescribed antidepressants, anxiolytics, anti-psychotics, or mood-stabilizers. This relationship was independent of living in the home with someone who has mental health issues. Another study demonstrated that in women with obsessive-compulsive disorder, being prescribed psychotropic medications was positively associated with higher ACE scores, in comparison with patients who were not taking medication (Benedetti et al., 2014).

Childhood exposure to a household member living with a mental health issue and its impact on health status and behaviors later in life has been sparsely examined throughout the literature. While the topic of ACEs and the impacts on health are being explored more and more, there are few studies that have focused on family-related ACEs, such as living with a household member who has a mental health issue. Wang (2021) is one of the few studies that examined this type of ACE and its impact on health and defines family-related ACEs as: death of a parent, domestic violence, physical and emotional neglect, physical illness of a parent/caregiver, mental illness of a parent/caregiver, family economic hardship, lack of food or starvation, living in an unsafe neighborhood, or living in an unclean community. negatively impact one's self-rated health during both childhood and adulthood. The study concluded that those who experienced at least one type of these ACEs have a self-rated health that is significantly lower than those who did not experience these types of ACEs. The impact of exposure to family-related ACEs aligns with the conclusions of the literature that deem ACEs as an

important predictor of health over the lifespan (Heerman et al., 2016; Porche et al., 2016). It is important to note that the scarcity of literature examining the impacts of family mental health issues supports the aspect of this study that seeks to explore the impact of family mental health issues and cervical cancer screening.

ACE Impact on Substance Abuse

The literature also confirms a dose-response relationship between the number of ACEs reported and the risk for engaging in risky behaviors, including substance abuse. For the sake of simplicity, I will be defining “substance abuse” to be inclusive of the abuse of prescription pills, alcohol, and illicit drugs. The focus of the impact of ACEs on the risk for substance abuse varies throughout the literature; some studies focus specifically on alcohol abuse, some focus on “drugs” as a general term, and others specify the types of drugs, such as prescription medications or illicit drugs. The literature suggests that the use of alcohol, drugs, and nicotine may be a conscious or unconscious choice because of the reprieve they provide from past trauma; these behaviors serve as a coping mechanism to assist with emotional regulation (Carmody, 2012). The landmark study (Felitti et al., 1998) examined the prevalence and odds ratios of alcoholism, use of illicit drugs, and the injection of illicit drugs. When comparing individuals who reported zero ACEs with those who reported four or more ACEs, the odds ratio for alcoholism was 7.4, 4.7 for illicit drug use, and 10.3 for injected illicit drug use.

Like living with someone with a mental health condition, family substance abuse can be detrimental to a child’s development. While the literature has been clear about the link between developmental delays and birth defects from fetal alcohol syndrome, it also

discusses how children are impacted when exposed to family drinking patterns. Children who are raised in households with someone who abuses alcohol are more likely to begin drinking alcohol in their teenage years, and are at increased risk for addiction (Zeitlin, 1994). Living in a household with a problem drinker also increases the risk for child physical abuse and the involvement of child protective services. Parental substance abuse is believed to be a primary factor in increasing rates of children entering foster care; despite these rising statistics, child welfare workers continue to lack adequate training and education on how to identify and address substance abuse in families, thereby leaving many children to experience lifelong effects of this family-related ACE (Dore et al., 1995). As these children mature into adulthood, the literature notes that many healthcare providers are wary about discussing these types of emotionally sensitive topics with their patients, leaving a significant gap in the healthcare system (Felitti et al., 1998).

There is strong evidence that suggests a correlation between alcohol use and various types of cancer. While that is not the focus of this study, it is important to understand the domino effect of elevated ACEs, increased risk for alcohol abuse, and the development of cancer later in life. In 2009, 3.5% (about 19,500) of cancer deaths in the United States were attributed to alcohol abuse (Nelson et al., 2013). One study proposed hypothetical reductions in alcohol use to estimate the impact on cancer deaths. In 2020-2021, there were an estimated 20,216 cancer deaths that were attributable to alcohol. The authors suggest that 83% (16,800) of those deaths could have been prevented had those who drank more than the recommendations by The Dietary Guidelines for Americans had either stopped drinking or adhered to those recommendations. These recommendations

state that women should drink no more than one drink per day, and that men should drink no more than two drinks per day (U.S. Department of Health and Human Services, Office of the Surgeon General, 2025). The prevalence of drinking alcohol in the United States in combination with the increased risk of substance abuse due to ACEs, along with the reluctance of healthcare providers to discuss this topic with patients, highlights a significant gap in the healthcare system, as well as a need for future research. This study will aim to address the gap by understanding how exposure to family substance abuse impacts cervical cancer screening in women.

ACE and Cervical Cancer Screening

Cervical cancer is a type of cancer in which the cells within the cervix grow uncontrollably. The cervix is present in individuals who were born female, and it connects the vagina/birth canal to the upper portion of the uterus. According to the Centers for Disease Control and Prevention (2021), cervical cancer most often occurs in women over the age of 30 years and is most caused by HPV, a sexually transmitted infection. While approximately 50% of sexually active persons will contract HPV at some point in their lives, only a minority will develop cervical cancer. Screenings for HPV and cervical cancer can be done by a pap smear.

In 2021, there were 12,536 new cases of cervical cancer in the United States. Data from 2022 indicates that there were 4,051 cervical cancer deaths in the United States. In South Carolina, 192 new cases of cervical cancer were reported in 2021; in 2022, 74 cervical cancer deaths were reported in the state (U.S. Cancer Statistics Working Group, 2024).

There is a breadth of literature that examines ACEs and various types of cancer and cancer screening behaviors, including cervical cancer; however, little to none of these examine these through the narrowed scope of the two ACEs of family substance abuse and family mental health issues. One such study used data from the 2014 Kansas BRFSS to determine the association between ACEs and cancer screening behaviors. A positive association was found between cervical cancer screening and specific ACEs, which include child physical abuse, emotional abuse, living with a problem drinker, living with someone who was mentally ill, and having parents who were separated or divorced (Alcalá et al., 2018). The adjusted odds ratios (AOR) for women ever having a Pap test were 0.98 for those who lived with someone with a mental illness; 1.48 for those who lived with a problem drinker; and 1.31 for those who lived with a drug user. A similar study using data from the 2009 Tennessee BRFSS (Alcalá et al., 2017) focused specifically on cervical cancer screening among women aged 21 years and older. Of the respondents ($n=1,527$), the AOR for women who lived with someone who was mentally ill was 0.65; 0.99 for those who lived with a problem drinker; and 1.95 for those who lived with someone who used drugs. These two studies demonstrate the impact that family mental health and family substance abuse have an impact on cervical cancer screening behaviors. It should be noted that there was no such study conducted using South Carolina BRFSS data, which is what this study will achieve.

There are numerous studies within the literature that support the significant impact of individual ACEs on health status and health behaviors. One such study (Bellis et al., 2023) explored such impacts by examining singular ACEs and how they might

increase risk for certain health behaviors or conditions. Conclusions included correlations between childhood verbal abuse, parental separation, and household alcohol problem with binge drinking; a correlation between obesity and child sexual abuse and household mental illness; a correlation between child sexual abuse and cannabis use; and a correlation between household alcohol problem and violence and incarceration.

ACEs have been shown to impact cancer screening behaviors. One such study (Brandford et al., 2023) examined the association between a history of ACEs and receiving cervical cancer screening among women in Texas. This is another study that did not focus on family mental health and family substance abuse to examine their impact on cervical cancer screening behaviors; rather, it examined three categories of ACEs: emotional, physical, and sexual abuse. The study concluded that women who reported 1-3 ACEs, and those with 6 or more ACEs, were statistically more likely to not receive cervical cancer screening when compared to women who reported zero ACEs. Another study confirmed that there is a graded dose-response relationship between ACEs and cervical cancer screening behaviors (Alcalá et al., 2017). A study that was conducted across twelve southeastern states in the United States, including South Carolina, confirmed that the more ACEs a person has, the more likely they are to engage in risky health behaviors, including neglecting Pap smears to screen for cervical cancer.

Individuals who report ACEs are more likely to seek out healthcare services, but less likely to keep their appointments. A 2019 study (Koball et al., 2019) confirmed this by exploring the impact of ACEs on healthcare utilization in adults in the United States. The study found that adults who reported four or more ACEs were more likely to make

healthcare appointments, but less likely to cancel those appointments, or not show. This finding illustrates a potential barrier to cervical cancer screening that needs to be explored. A protective factor to address this barrier is having a primary care provider (Machtiger et al., 2015). Primary care providers are able to provide psychosocial support to individuals who have a history of ACEs, as well as link them to appropriate resources for further treatment.

Cervical Cancer Initiatives in South Carolina

The South Carolina Department of Public Health leads the state's breast and cervical cancer detection program for women aged 21-64 years who are underinsured or uninsured. BCN provides mammograms and cervical cancer screenings at no cost to eligible women (SC Department of Public Health, 2025) and has been in effect for 34 years. In the previous fiscal year, BCN served 14,777 patients in South Carolina, identifying 156 cases of pre-cervical cancers and 60 cases of cervical cancer. BCN has identified several barriers to cervical cancer screenings, to include fear of negative results, difficulty keeping appointments due to work schedules, transportation, education, and communication. BCN continues to educate providers and staff regarding cultural competency, particularly for the large Hispanic population in South Carolina, as well as providing updated cancer screening guidelines (Autry & Mann, 2024).

While BCN does impactful work in South Carolina, it does not consider ACEs as a factor for cancer screening behaviors. This study has the potential to enhance BCN by incorporating trauma-informed approaches to engaging patients to increase trust between patients and providers, as well as positively impact cervical cancer screening behaviors.

Gap in the Literature

Current research focuses on either ACEs in general and their correlation to certain health behaviors, or specific ACEs are selected to be the focus of these correlations; however, family mental health and family substance abuse are not substantially focused upon in these studies to ascertain the impact, if any, on health behaviors. Specifically, these ACEs are not currently used to ascertain the impact, if any, on cervical cancer screening behaviors. Additionally, this type of research is not conducted on populations within South Carolina. This study aims to address these gaps by examining the impact of family mental health and family substance abuse on cervical cancer screening behaviors among women in South Carolina. While the BCN program does identify barriers to screening, it fails to consider the impact of any ACEs at all, which this study will do.

Prior Studies Using the Chosen Methodology

The method used in this proposal is quantitative, using descriptive analysis and binary logistic regression analysis. There are several studies that have used this methodology in their examinations of ACEs on different health outcomes. One such study examined the association between elevated ACE scores and odds of cancer in adulthood. Using data from the 2014 Kansas Behavior Risk Factor Surveillance System (BRFSS), logistic regressions were used to calculate the odds of cancer screening behaviors and associated ACE counts (Alcalá et al., 2018). Descriptive analysis was used to categorize cancer risk by ACE categories, such as physical abuse, sexual abuse, or parental separation/divorce, as well as categorized the participants by male or female. This study found that emotional abuse and sexual abuse were associated within increased

odds of colorectal cancer screening. Living with a drug user (AOR = 0.66, 95% CI = 0.47, 0.94) was associated with reduced odds of receiving a colonoscopy or sigmoidoscopy among women, while living with a problem drinker was associated with increased odds receiving these screenings among men (AOR = 1.29, 95% CI = 1.02, 1.64).

The above study was an expansion of a previous study that sought to determine which ACEs were impactful on colorectal screening (Alcalá et al., 2017). Univariate statistics and logistic regression analysis were used to analyze data from the 2011 BRFSS for Nebraska and Washington. A descriptive analysis illustrated the mean of both men and women who had reported specific ACEs. Race, educational attainment (years), current health insurance status, history of cancer diagnosis, and state of residence were also analyzed. These variables, along with age, were added as controls to bivariate models. After accounting for confounders, sexual abuse (AOR = 1.18; 95% CI = 1.06, 1.33) and emotional abuse (AOR = 1.09, 95% CI = 1.01, 1.18) were associated with increased odds of colorectal screening. The analysis found that sexual abuse was more common in Washington, relative to Nebraska (OR = 1.70; 95% CI = 1.44, 2.02), and colorectal screening was less common in Washington, relative to Nebraska (OR = 0.61; 95% CI = 0.56, 0.67), which the authors concluded supported state of residence as a suppressor. Regarding emotional abuse, no single variable altered the significance from the bivariate model. After accounting for all cofounders and all ACEs, the analyses concluded that sexual abuse (OR=1.18; 95% CI=1.05, 1.32) was associated with increased odds of colorectal screening.

Alacala et al (2017) examined the correlation between ACEs and cervical cancer screening. Using 2009 data from the Tennessee BRFSS, the study sought to model odds of ever and recently engaging in cervical cancer screening. Means and frequencies were calculated for the following categories: cervical cancer screening history, nine ACEs, age, race, educational attainment (years), and whether or not the respondent had a hysterectomy. Bivariate logistic analyses included each of the nine ACEs and cervical cancer screening behavior. Living in a household where there was domestic violence was associated with a 104% increase in odds of receiving cervical cancer screening (OR = 2.04; 95% CI = 1.13, 3.68). Additional bivariate models showed that physical abuse was associated with a 46% reduction in odds of receiving cervical cancer screening (OR = 0.54; 95% CI = 0.31,0.94).

A more recent study (Brandford et al., 2023) sought to examine the impact of ACEs on cervical cancer screening behaviors among women in Texas. Utilizing data from the 2020 Texas BRFSS, multiple regression analysis was used to predict whether women were engaging in cervical cancer screening behaviors based on the number and type of ACEs they reported. Chi-square analysis was used to identify associations among demographic characteristics, cancer screening uptake, and ACE number and type. Demographic data included gender, age, race and ethnicity, marital status, education level, and annual household income. The number of ACEs were categorized from zero, 1-3, 4-5, and 6 or more. The number of ACEs were correlated with each demographic characteristic. A second analysis compared each of the demographic characteristics with whether or not the respondent had received the recommended cervical cancer screening.

This study found that physical abuse was the greatest predictor of not receiving cervical cancer screenings (OR = 3.88; 95% CI = 1.15,13.1). Reporting any type of ACE showed that respondents were 2.1 times less likely to have received the recommended screening.

Comparing relationships between single types of ACEs and various health outcomes is common throughout the literature. Many researchers focus on identifying strong cumulative associations between these two factors, rather than examining the impact of specific ACEs. Bellis et al (2023) conducted such research in England and Wales. This secondary analysis reviewed data from eight cross-sectional general population ACE surveys. In both bivariate and logistic regression analyses, exposure to verbal abuse only was significantly associated with an increased risk of binge drinking, cannabis use, teen pregnancy, violence perpetration and victimization, low mental well-being, and incarceration. Reporting the single ACE of family mental illness was significantly associated with binge drinking, obesity, lower mental well-being, cannabis use, sexually transmitted infection, and incarceration. Reporting the single ACE of family substance abuse (specifically to this study, alcohol) was significantly associated with all of these, plus violence perpetration or victimization.

Each of these researchers used quantitative methods in their studies. While the analyses might somewhat differ from what this study proposes, they were still answering similar research questions and were able to successfully draw conclusions to benefit the literature.

Definitions

Adverse childhood experiences (ACEs): “Childhood abuse and household dysfunction” (Felitti et al., 1998).

Cervical cancer: “a growth of cells that starts in the cervix” (Mayo Clinic, 2025).

Cervix: “the lower part of the uterus that connects to the vagina” (Mayo Clinic, 2025).

Human papilloma virus (HPV): “a common infection that is passed through sexual contact” (Mayo Clinic, 2025).

Pap Test: “a procedure that involves collecting cells from the cervix for testing” (Mayo Clinic, 2024).

Protective factors: “characteristics that are associated with a lower likelihood of negative outcomes or that reduce a risk factor’s impact” (SAMHSA, n.d.)

Resilience: “the process and outcome of successfully adapting to difficult or challenging life experiences, especially through mental, emotional, and behavioral flexibility and adjustment to external and internal demands” (APA Dictionary of Psychology, 2018).

Risk factors: “characteristics at the biological, psychological, family, community, or cultural level that precede and are associated with a higher likelihood of negative outcomes” (SAMHSA, n.d.).

Socioeconomic: “Relating to or involving a combination of social and economic factors” (Merriam-Webster, n.d.).

Toxic stress: “stress that is prolonged, severe, or chronic” (Franke, 2014).

Assumptions

I assume that the process of data collection for the 2020 South Carolina BRFSS was extensive, as was the data associated with subsection questions regarding ACEs. Other assumptions include that the respondents were women between the ages of 18 and 65 and that they understood the questions on the questionnaire and responded to those questions honestly and without bias. I assume that the data collection process was rigorous and time-consuming and resulted in valid data. Lastly, I assume that every respondent gave informed consent prior to responding to the survey questions.

Scope and Delimitations

The data used for this study is from the South Carolina BRFSS. This dataset had 2,575 respondents via landline phone interviews and 7,544 respondents via mobile phone interviews, for a total of 10,119 respondents. Respondents were 18 years of age or older. The ACEs subsection is specific to the South Carolina BRFSS and will be made available by the South Carolina Department of Public Health. Regarding cervical cancer, the national dataset indicators included “Have you ever had a cervical cancer screening test?”, “How long has it been since you had your last cervical cancer screening test?”, “At your most recent cervical cancer screening, did you have a Pap test?”, and “At your most recent cervical cancer screening, did you have an HPV test?”

The EAM (Srivastav et al., 2020) combines current evidence around ACEs, the SEM, and the Protective Factors Framework. The EAM provides tangible steps to prevent ACEs by implementing protective factors to build resiliency and promote health equity across the lifespan, rather than just focusing on childhood. Similar to the SEM, the

EAM addresses multiple levels to affect change from the individual to health policy. Several other aspects of ACEs that are essential but will not be discussed in this study, including strategies to address ACEs, ACEs screening behaviors, resources to address trauma, intergenerational trauma, and more.

Limitations

Because this study is a secondary analysis of archived data, I am confined to the original study's objectives and design. I did not participate in the planning process or in the data collection process. This work is centered on the parameters of the existing database for both national and state-level data. Another limitation is that ACEs are self-reported, and therefore may be subject to response bias. It is important to note that I did not have any input on the ethical considerations for the collection, analysis, or storage of the data. Lastly, I will not be able to establish cause and effect, but rather only potential associations, due to the correlational methodology used in this study.

Significance

Determining that the self-reported ACEs of family mental illness and family substance abuse are or are not significant predictors of cervical cancer screening among women aged 18-65 in South Carolina will highlight the need for trauma-informed care for this population as well as explain barriers to healthcare access for programs across the state. Policymakers will be informed as to the impact of family mental illness and family substance abuse on health behaviors later in life, which could promote ACEs screening as a standardized tool in healthcare, as well as resilience-building programs beginning in childhood in order to mitigate early the effects of toxic stress. The findings of this study

could also improve healthcare services for this population, offering them more trauma-informed, comprehensive care that considers and addresses adverse experiences in a knowledgeable and supportive manner. Understanding the correlation between ACEs and increased risk for cancer and the impact on cancer screening behaviors can make providers more proactive in educating their patients on this topic. If the findings of this study do not predict the outcome, then this study will be used as a basis for future research on the topic of ACEs and cervical cancer screening.

By examining the correlation between family mental illness and family substance abuse and cervical cancer screening behaviors, this study may inform healthcare providers as to the importance and need for trauma-informed care to adequately address patient trauma history, support patients with trauma history, and identify ACEs as a potential barrier to engaging in cervical cancer screening behaviors. Because South Carolina's BCN program reports low participation in cervical cancer screening among their eligible population, understanding the impact of ACEs may address this issue and help healthcare providers and patients overcome this barrier to increase participation in screenings. A potential sustainable social change impact of this study could be to increase the rate of cervical cancer screenings in South Carolina, thereby reducing the incidence of associated mortality.

Summary and Conclusions

ACEs have a significant impact on health status and health behaviors throughout the lifespan (Felitti et al., 1998; Zarse et al., 2018). While there is a breadth of literature examining the impact of ACEs on various health outcomes, there is no focus on

specifically family mental illness and family substance abuse, particularly in South Carolina. This study will be a secondary analysis of archived data using the 2020 BRFSS at the state-level, as well as a state-specific subsection of ACEs questions. This study has the potential to address the gap of the two identified ACEs and their impact on cervical cancer screening behaviors in South Carolina, and it has the potential to increase screening behaviors, thereby reducing mortality rates associated with cervical cancer. In Section 2, I will explain the methodological approach utilized in this study, including a comprehensive plan for data analysis.

Section 2: Research Design and Data Collection

Introduction

This quantitative correlation study examined the association between two specific ACEs—family substance abuse and family mental illness—and the impact of each on cervical cancer screening behavior among women aged 18-65 years in South Carolina. The dependent variable was cervical cancer screening behavior, and the independent variables were family substance abuse and family mental illness. The confounding variables were race/ethnicity and income level. Previous research has failed to examine the correlations of these specific ACEs and cervical cancer screening behavior. Other studies have focused on state-specific populations, as outlined in the literature review; however, South Carolina has not yet been the focus of these studies. Thus, this research study fills these gaps in the literature. The variables used in this study were collected from the South Carolina BRFSS survey database.

Section 2 includes a description of the research design and rationale, methodology, threats to validity, ethical procedures, and a summary of the information under each of the subtopics. The research design section identifies the variables used in the study, the types of research designs used in the study, how they correspond to the research questions established in Section 1, why the research design was selected, as well as why choosing a design is essential to this research study. The methodology section describes the target population, sample strategy, inclusion and exclusion data information, study source and access to the dataset, power analysis for sample size,

instrumentation of constructs, operationalization of the selected variables, and the data analysis plan. The Threats to Validity section describes the threats to internal and external validity. The Ethical Procedures section includes details regarding the anonymity and security of the dataset, along with any other ethical processes. The summary concludes the key points of each subsection.

Research Design and Rationale

The research variables used in this study are cervical cancer screening behavior (dependent variable), family mental illness (independent variable), family substance abuse (independent variable), race/ethnicity (confounding variable), and income level (confounding variable). The original data were collected and analyzed numerically; thus, this is a quantitative study. A quantitative correlational study is conducted to describe a relationship between two variables (Ellis-Jacobs, 2011). In this case, the goal was to describe a relationship between family substance abuse and cervical cancer screening behavior and family mental illness and cervical cancer screening behavior, while controlling for race/ethnicity and income level. Figure 4 illustrates the conceptual differences between correlational and experimental research designs.

Figure 4*Correlational Versus Experimental Research*

Correlational Research	Experimental Research
<ul style="list-style-type: none"> • Identify relationships between variables • No manipulation (observes natural variations) • No control over variables • Cannot establish causality 	<ul style="list-style-type: none"> • Determine cause-and-effect relationships • Manipulates independent variables • Uses control groups and random assignment • Can establish causality

Note. From QuestionPro Survey Software, 2025.

(<https://www.questionpro.com/blog/correlational-research>)

Because a secondary dataset was used in this study, the quantitative correlational study design was the best option because it could directly examine the research questions that were described in Section 1. This study design also does not seek to establish a cause-and-effect relationship. Any correlation established between the independent and dependent variables reflects the strength of that relationship (Devi et al., 2022). This study design was selected because it is uncertain if or how the variables relate to each other, or how strong that relationship may be. Because this is secondary data, there is no opportunity for randomization of the sample; therefore, generalization is reduced. Ultimately, the correlational study was selected due to its ease and flexibility when dealing with large datasets.

Methodology

Data Sampling

This section describes the methodology used for this quantitative correlational study. The South Carolina BRFSS survey's original data collection is a result of a partnership between the South Carolina Department of Public Health and the Centers for Disease Control and Prevention, in which the South Carolina Department of Public Health uses in-house interviewers and/or contracts with telephone call centers or universities to administer the surveys throughout the year. The survey consists of standardized core questions, with optional modules and state-added questions. Respondents are contacted through random digit dialing techniques on both landline and mobile phones (Centers for Disease Control and Prevention, 2022). The survey collects information regarding health-related risk behaviors and events, chronic health conditions, and the use of preventive health services. Because the Centers for Disease Control and Prevention work with state health departments to collect this data, the BRFSS survey is considered to be a reliable data source for research.

Population

The most recent year that South Carolina data are available for ACEs is 2021. That year, data was collected from 10,057 respondents in South Carolina. The BRFSS survey consists of standardized core questions, with optional modules and state-added questions. Respondents are contacted through random digit dialing techniques on both landline and mobile phones (Centers for Disease Control and Prevention, 2022). The BRFSS collects information regarding health-related risk behaviors and events, chronic

health conditions, and the use of preventive health services. Such data collected that is relevant to this study is cervical cancer screening behaviors and, in state-specific data, questions regarding ACEs that include questions about family mental illness and family substance abuse.

Operationalization for Each Variable

The dependent variable, cervical cancer screening behavior, was measured by asking, “Have you had a cervical cancer screening in the past 3 years?” For this study, I assigned the response *no* to a value of 0, and the response *yes* to a value of 1. The independent variables, family mental illness and family substance abuse, were based on self-reported answers to the questions: “During your first 18 years of life, did you live in the same household as someone with a mental illness?” and “During your first 18 years of life, did you live in the same household as someone with substance abuse problems?” For each of the independent variables as follows: *1 = did not have family mental illness* and *2 = did not have family substance abuse problems*.

The confounding variables were race/ethnicity and income level. Race/ethnicity were measured by asking the questions, “What race do you identify as?” and “What ethnicity do you identify as?” The variable was identified *1 = Caucasian, 2 = African-American/Black, 3=Asian/Other Pacific Islander, 4=North African/Middle Eastern, 5=American Indian/Alaskan Native, and 6 = Other*. Ethnicity was identified as *1 = Hispanic, 2 = White, Non-Hispanic, 3 = Black, Non-Hispanic, and 4 = Other Multiracial, Non-Hispanic*. Income level was measured by asking the question, “What is your income level?” The variable was identified by the following: *1 = Less than \$10,000, 2 = Less*

than \$20,000, 3 = Less than \$25,000, 4 = Less than \$35,000, 5 = Less than \$50,000, 6 = Less than \$75,000, 7 = Less than \$100,000, 8 = Less than \$150,000, 9 = Less than \$200,000, 10 = \$200,000 or more, 11 = Don't know/Not Sure, and 12 = Refused.

Data Analysis Plan

Data Preparation

The process of data preparation involves six steps: accessing the data, ingesting the data, cleaning the data, formatting the data, combining the data, and the data analysis (Bhanot, 2021). I accessed the data for this study from the BRFSS housed on the CDC website. Then, I uploaded the data into the Statistical Package for the Social Sciences (SPSS), using only the data that were relevant to this study.

Data Cleaning

I used SPSS to clean and screen the relevant data and identify any missing, blank, or duplicated data cells. These items were excluded from the study. Descriptive statistics were used to describe the population characteristics of the sample in my study, including race/ethnicity, income level, and age. Descriptive statistics provided the averages of each data point and included measures of central tendency, variability, and distribution. Central tendency refers to the median, mean, and mode of the data (Guetterman, 2019). Variability is measured by standard deviation, range, kurtosis, skewness, and minimum and maximum values. Distribution refers to the variations in the outcome of the data. I used binary logistic regression for the correlation and predictor variable.

Binary Logistic Regression

Binary logistic regression was selected because it is a dichotomous model. The dependent variable, cervical cancer screening behavior, was assigned values of 0 = no screening in the past 3 years and 1 = screening within the last 3 years. This method describes how variables are associated with the outcome and estimate such an outcome (Hanson, 2022).

Assumptions of Binary Logistic Regression

All variables in this study are categorical, except the dependent variable, cervical cancer screening behavior, which is dichotomous. The categories for cervical cancer screening behavior are 0 = no screening in the past 3 years; 1 = screening within the past 3 years. The independent variables, family mental illness and family substance abuse, are also categorical variables. Logistic regression was used to examine the bivariate association between the dependent variable and the independent variables. Multivariate logistic regression was used to determine whether these associations persisted after controlling for race/ethnicity. Inferential data analysis further examined the relationships between the variables to ascertain the probability of the mutually exclusive variables. These methods were used to test each of the four hypotheses in this study.

Inferential statistics were used to measure the data through correlation and bivariate and multivariate regression tests. The bivariate and multivariate logistic regression tests identified associations between cervical cancer screening behaviors, family mental illness and family substance abuse.

Threats to Validity

The BRFSS originally depended solely on landline phones to reach their respondents. In 2008, to address the growing use of mobile phones, mobile numbers were added to the random sampling protocol, and this was piloted in 2009 (Blumberg et al., 2006). In 2011, the BRFSS released data that were obtained from both landline and mobile phone lines (Pierannunzi et al., 2013). Because mobile phone numbers often change owners, the lack of consistency of being able to reach the same respondents year after year may threaten validity.

Ethical Procedures

I am bound by the BRFSS dataset that was used in this study. By using this data, I assume that the data was collected ethically, effectively, and efficiently. I did not receive any raw data, nor did I conduct any data analysis, until I received IRB approval from Walden University. I did not accept or analyze any data that contained personal identifiers. The data will be stored on a computer to which only I have access, and such information will only be shared with my chair and committee members. Data and all analyses will be stored for a minimum of 5 years.

Summary

This quantitative correlational study was conducted to examine the relationships between cervical cancer screening behaviors and exposure to family substance abuse and/or family mental illness among women aged 18-65 years in South Carolina. State-level BRFSS data were used to examine these relationships. My data analysis plan included binary logistic regression and descriptive statistics to conduct data analysis and

test the hypotheses. I prepared the data for analysis using SPSS and omitted any missing or duplicate data. It is my assumption that the original data collection was completed using valid, rigorous, and ethical methods. This study will effect positive social change by seeking to improve cervical screening uptake and promote women's overall health, while also promoting trauma-informed care. Section 3 will cover the accessibility of the original dataset, a detailed description of the statistical analysis conducted, results of the data analysis plan, and a conclusion and summary of the answers to the research questions.

Section 3: Presentation of the Results and Findings

Introduction

The purpose of this quantitative, correlational study was to determine if there is any association between childhood exposure to family substance abuse (living with a problem drinker/alcoholic, and living with someone who used illegal drugs, and living with a family member with mental illness) and cervical cancer screening (pap test) behaviors among women aged 18-65 years in South Carolina, while controlling for race/ethnicity, income level, and education. The ACE variables were revised once the BRFSS data were accessed to better align with how those questions were posed in the original study. This study also addressed the number of women in South Carolina who report ACEs and have engaged in cervical cancer screenings within the last 3 years, utilizing data from the 2020 South Carolina BRFSS, which also includes subsection questions regarding ACEs. Because of the revision of two of the ACE variables, “living with a problem drinker/alcoholic” and “living with someone who used illegal drugs,” the research questions are:

- RQ 1: What is the relationship between childhood exposure to living with a problematic drinker/alcoholic and cervical cancer screening among women ages 18-65 in South Carolina while controlling for race/ethnicity, income level, and education?
- RQ 2: What is the relationship between living with a family member who used illegal drugs and cervical cancer screening among women ages 18-65 in

South Carolina while controlling for race/ethnicity, income level, and education?

- RQ 3: What is the relationship between living with a family member who had mental health issues and cervical cancer screening among women ages 18-65 in South Carolina while controlling for race/ethnicity, income level, and education?
- RQ 4: To what extent does childhood exposure to living with a problem drinker/alcoholic predict cervical cancer screening among women aged 18-65 in South Carolina while controlling for race/ethnicity, income level, and education?
- RQ 5: To what extent does living with a family member who used illegal drugs predict cervical cancer screening among women aged 18-65 in South Carolina, while controlling for race/ethnicity, income level, and education?
- RQ 6: To what extent does living with a family member with mental health issues predict cervical cancer screening among women aged 18-65 in South Carolina while controlling for race/ethnicity?

Accessing the Data Set for Secondary Analysis

I used data archived from the BRFSS 2020 database and the South Carolina BRFSS database for 2020. Data were collected from January-December of 2020. Participants aged 18 years and older were able to respond by landline telephone or by mobile phone. In South Carolina, there was a total number of 1,323 respondents. The only discrepancies in the use of the dataset from the plan presented in Section 2 was that,

out of the 3 years (2019-2021) of data that I received from the South Carolina Department of Public Health, only 2020 included questions on both ACEs and cervical cancer screening.

In addition, the ACEs questions were asked differently than I had originally posed in earlier sections that contained my research questions. Instead of simply asking about living with someone with a “substance abuse” issue, BRFSS questions specify and distinguish “living with a problem drinker/alcoholic” and “living with someone who used illegal drugs.”

My study used age, race, ethnicity, and income level, as originally presented in earlier sections; however, education was added to give additional insight into the association between ACEs and cervical cancer screening behaviors. Previous studies (Zarse et al., 2019) indicate that women exposed to ACEs may have lower educational attainment due to disrupted development or schooling. Educational attainment is also strongly correlated with cervical cancer screening, as higher education levels are linked to greater health literacy and preventive care utilization. Therefore, failing to control for education could confound the relationship between ACEs and pap test screening.

Included in the current dataset were women who live in South Carolina and are between the ages of 18 and 65 years of age, of varied races and ethnicities. The women were separated into the following age ranges: 18-29; 30-39; 40-49; 50-59; 60-65. When conducting the tests, the outcome variable (engaging in cervical cancer screening behavior) was recorded as 0 = No and 1 = Yes. Data were analyzed between August and September of 2025.

The original study conducted random sampling, to which I was bound in this study. My threat to validity was prevalent due to random sampling being used in the original study and because of the controlling variables. Because 100% of the population was between the ages of 18-65, the representation of the sample size was valid.

Study Sample

The analytic sample consisted of 1,323 unweighted respondents, representing approximately 1.3 million South Carolina women ages 18–65 when survey weights were applied. The majority of respondents were between 30 and 49 years old, and most identified as non-Hispanic White or non-Hispanic Black. Roughly half of the respondents reported household incomes of \$50,000 or more, while smaller proportions reported middle (\$25,000–\$49,999) or low (<\$25,000) income levels. Educational attainment was diverse, with women represented across the categories of high school or less, some college or technical training, and college graduate. In terms of ACEs, a substantial minority reported living with a problem drinker or alcoholic, someone who was depressed, mentally ill, or using illegal drugs. Most respondents were up to date with pap testing within the past 3 years.

Statistical Assumptions

The dependent variable was verified to be categorical, and the values were No = 0 and Yes = 1. The independent variables were also categorical. Missing and excluded data were removed. After the assumptions for using logistic regression were met, the findings were reviewed and analyzed. Binary logistic regression requires several key assumptions that were evaluated prior to analysis. First, the dependent variable (pap test within the

past 3 years) was dichotomous, satisfying the requirement for a binary outcome.

Independent variables were either categorical or continuous as appropriate, and all were coded consistently with reference groups specified. The assumption of independence of observations was met, as BRFSS respondents represent unique individuals without repeated measures.

Multicollinearity among independent variables was assessed using tolerance and variance inflation factor (VIF) values in linear regression diagnostics. All VIF values were below 2.0, indicating no problematic multicollinearity. Linearity of the logit for continuous predictors was examined by assessing age, and results supported the assumption of a linear relationship with the log odds of the outcome. Finally, sample size requirements were met, with more than 10 cases per predictor variable in the model. Taken together, these diagnostics indicated that the assumptions for binary logistic regression were satisfied.

Logistic Regression Research Questions & Findings

This study assessed the relationship between selected ACEs and cervical cancer screening among women ages 18–65 in South Carolina, using weighted 2020 BRFSS data. Six research questions were analyzed with binary logistic regression. RQ1–3 assessed the relationships between individual ACE exposures and Pap test screening. RQ4–6 evaluated the predictive strength of each ACE while adjusting for race/ethnicity, income, and education. Unadjusted and adjusted logistic regression models were estimated using the same analytic sample. Adjusted models simultaneously included age, race/ethnicity, income, and education to assess potential confounding of the association

between ACEs and cervical cancer screening. Covariates were selected a priori based on established associations with preventive screening behaviors.

Table 1

Adjusted Logistic Regression Predicting Up-to-Date Pap Testing Among Women by ACE Exposure

Predictor (ACE exposure)	Adjusted Odds Ratio	95% CI	<i>p</i>
Lived with problem drinker/alcoholic	0.95	0.92 – 0.98	< .001
Lived with family member who used illegal drugs	1.64	1.58 – 1.70	< .001
Lived with household member with mental illness	0.71	0.69 – 0.73	< .001

Note. All models were adjusted for age, race/ethnicity, household income, and educational attainment. Up-to-date Pap test screening was defined as receipt of a Pap test within the past 3 years. Adjusted odds ratios were similar in magnitude to unadjusted estimates (not shown), indicating minimal confounding by sociodemographic variables.

In adjusted logistic regression analyses controlling for age, race/ethnicity, household income, and educational attainment, several ACE exposures were significantly associated with up-to-date cervical cancer screening among South Carolina women aged 18–65. Women who reported living with a problem drinker or alcoholic during childhood had lower odds of being up-to-date with Pap test screening (AOR = 0.95, 95% CI: 0.92–0.98, $p < .001$). In contrast, women who reported living with a family member who used illegal drugs had higher odds of being up-to-date with screening (AOR = 1.64, 95% CI: 1.58–1.70, $p < .001$). Additionally, living with a household member with mental illness

during childhood was associated with lower odds of up-to-date Pap test screening (AOR = 0.71, 95% CI: 0.69–0.73, $p < .001$). Adjusted odds ratios were similar in magnitude to unadjusted estimates (not shown), indicating that age, race/ethnicity, income, and education did not substantially confound the observed associations between ACE exposures and cervical cancer screening.

Research Question 1

Research Question 1: What is the relationship between childhood exposure to living with a problematic drinker/alcoholic and cervical cancer screening among women ages 18–65 in South Carolina while controlling for race/ethnicity, income level, and education? Findings indicated that women who reported living with a problem drinker or alcoholic had significantly higher likelihood of being up-to-date on Pap testing (OR = 1.41, 95% CI [1.39, 1.42], $p < .001$). This association remained after adjusting for race/ethnicity, income, and education, suggesting that exposure to this ACE was independently related to cervical cancer screening.

Research Question 2

Research Question 2: What is the relationship between living with a family member who used illegal drugs and cervical cancer screening among women ages 18–65 in South Carolina while controlling for race/ethnicity, income level, and education? Findings indicated that women who lived with someone who used illegal drugs also demonstrated significantly greater likelihood of Pap test screening (OR = 1.20, 95% CI [1.19, 1.21], $p < .001$). This relationship persisted when adjusting for sociodemographic

covariates, indicating an independent association between this ACE exposure and screening adherence.

Research Question 3

Research Question 3: What is the relationship between living with a family member who had mental health issues and cervical cancer screening among women ages 18–65 in South Carolina while controlling for race/ethnicity, income level, and education? Results indicated that living with a family member who had mental health issues was not significantly associated with Pap test screening after adjustment (OR = 0.98, 95% CI [0.97, 1.02], $p > .05$). This suggests that this ACE did not independently predict cervical cancer screening behavior in the study sample.

Research Question 4

Research Question 4: To what extent does childhood exposure to living with a problem drinker/alcoholic predict cervical cancer screening among women aged 18–65 in South Carolina while controlling for race/ethnicity, income level, and education? In the fully adjusted logistic regression model, exposure to living with a problem drinker significantly predicted higher likelihood of being up to date with Pap screening (OR = 1.41, 95% CI [1.39, 1.42], $p < .001$). This remained consistent across models, suggesting a robust predictive effect of this ACE on screening.

Research Question 5

Research Question 5: To what extent does living with a family member who used illegal drugs predict cervical cancer screening among women aged 18–65 in South Carolina, while controlling for race/ethnicity, income level, and education? Adjusted

analyses showed that living with someone who used illegal drugs was a significant predictor of Pap screening (OR = 1.20, 95% CI [1.19, 1.21], $p < .001$). This finding indicates that this ACE exposure contributed independently to predicting cervical cancer screening status, even after accounting for demographic and socioeconomic variables.

Research Question 6

Research Question 6: To what extent does living with a family member with mental health issues predict cervical cancer screening among women aged 18–65 in South Carolina while controlling for race/ethnicity? Living with a family member with mental health issues was not a significant predictor of Pap test screening in adjusted models (OR = 0.98, 95% CI [0.97, 1.02], $p > .05$). While this ACE is relevant to broader health outcomes, it did not specifically predict cervical cancer screening behavior among women in this analysis.

Summary

Overall, two ACE exposures—living with a problem drinker/alcoholic and living with someone who used illegal drugs—were significantly and positively associated with Pap test screening, even after adjusting for covariates. Living with someone with mental health issues did not demonstrate a significant relationship or predictive value. These findings suggest that certain ACE exposures may increase preventive health engagement, while others do not appear to influence screening behaviors.

Table 2 summarizes the weighted demographic characteristics of the study sample. Table 3 presents the unadjusted logistic regression models examining the relationship between ACE exposures and Pap test screening. Table 4 shows the adjusted logistic regression results controlling for age, race/ethnicity, income, and education. Adjusted logistic regression models controlled for age, race/ethnicity, income, and education. Adjusted logistic regression analyses included ACE exposures and sociodemographic covariates (age, race/ethnicity, income, and education). After adjustment, living with a problem drinker/alcoholic (AOR = 1.41, 95% CI [1.39, 1.42], $p < .001$) and living with someone who used illegal drugs (AOR = 1.20, 95% CI [1.19, 1.21], $p < .001$) were significantly associated with higher likelihood of being up-to-date on Pap screening. Living with a family member with mental health issues was not significantly associated with screening adherence (AOR = 0.98, 95% CI [0.97, 1.02], $p > .05$). Adjusted odds ratios were similar in magnitude to unadjusted estimates, indicating that age, race/ethnicity, income, and education did not substantially confound the association between ACEs and cervical cancer screening. Table 5 reports the multicollinearity diagnostics for the independent variables included in the adjusted regression models. The stability of effect estimates suggest that observed associations reflect independent relationships rather than sociodemographic influences. Figure 5 illustrates Pap test screening within the past 3 years by ACE exposure among women ages 18–65 in South Carolina using weighted BRFSS 2020 data. Overall, most women reported being up to date with cervical cancer screening, though variation is visible across ACE exposure categories.

Section 4 presents an interpretation of these findings, discusses implications for public health practice, and examines the potential for positive social change based on the results of this study.

Table 2

Weighted Sample Characteristics of South Carolina Women Ages 18–65, BRFSS 2020

Characteristic	Weighted <i>n</i>	Weighted %
Age (Years)		
18-29	351	15.7
30-39	337	15.1
40-49	421	18.9
50-59	597	26.7
60-65	527	23.6
Total	2233	100
Race/Ethnicity		
White	836	63.2
Black/African American	362	27.4
Hispanic	36	2.7
Other (Asian, NHPI, AIAN)	28	2.1
Multiracial/Other	42	3.2
Total (Valid)	1304	98.6
Missing	19	1.4
Income		
Low (<\$25k)	307	27.5
Mid (\$25-\$49k)	265	23.8
High (\$50k+)	543	48.7
Total (valid)	1115	100
Education		
<High school diploma/HS diploma	411	31.2
Some college/technical	364	27.6
College graduate	542	41.2
Total (valid)	1317	100
ACE Exposure		
Living with a problem drinker/alcoholic (yes)	164	23.6%
Living with someone who used illegal drugs (yes)	201	29.0%
Living with someone with mental health issues (yes)	143	13.6%
Cervical Cancer Screening		
Pap test within past 3 years (yes)	901	79.8%
Total (valid)	1129	

Table 3

Unadjusted Logistic Regression of ACE Exposures and Pap Test Screening, South Carolina Women Ages 18–65

Variable	OR	95% CI	p-value
Living with a problem drinker/alcoholic	1.14	1.39-1.42	<.001
Living with someone who used illegal drugs	1.20	1.19-1.21	<.001
Living with someone who had mental health issues	0.98	0.97-1.02	.652

Table 4

Adjusted Logistic Regression of ACE Exposures and Pap Test Screening, Adjusted for Age, Race, Income, and Education

Predictor	AOR	95% CI for AOR	p-value
ACE Exposures			
Lived with problem drinker/alcoholic	1.41	[0.923, 0.976]	<.001
Lived with family member who used illegal drugs	1.20	[1.576, 1.701]	<.001
Lived with family member with mental health issues	0.98	[0.692, 0.731]	<.001

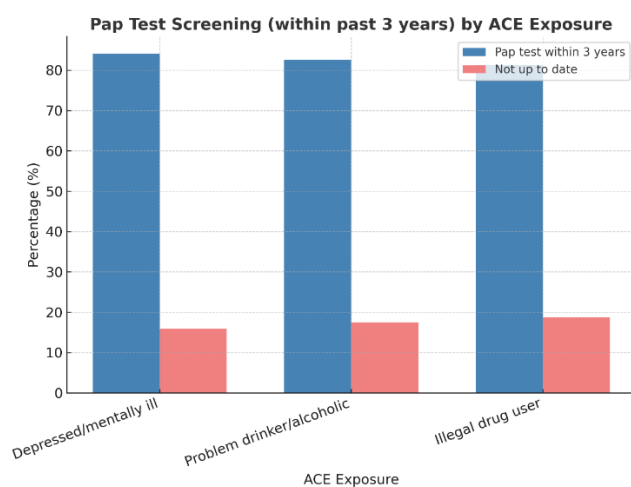
Note. AOR = adjusted odds ratio; CI = confidence interval. Adjusted models control for age, race/ethnicity, annual household income, and educational attainment. Survey weights were applied to all analyses

Table 5*Multicollinearity Diagnostics for Independent Variables in Adjusted Logistic Regression*

Predictor	Tolerance	VIF
Lived with problem drinker/alcoholic	.781	1.280
Lived with family member who used illegal drugs	.754	1.325
Lived with family member with mental health issues	.836	1.196
Age (continuous)	.941	1.062
Race/Ethnicity	.947	1.056
Income (low, mid, high)	.779	1.284
Education	.775	1.291

Figure 5

Pap Test Screening (Within Past 3 Years) by ACE Exposures Among Women Ages 18–65 in South Carolina, BRFSS 2020



Section 4: Application to Professional Practice and Implications for Social Change

Introduction

The purpose of this study was to examine associations between ACEs and cervical cancer screening behavior among women in South Carolina. The findings contribute to the evidence base on the ways early-life adversity may influence engagement in preventive health behaviors. This section presents the implications for social change and professional practice, an interpretation of findings within public health and clinical contexts, limitations of the study, recommendations for practice and policy, and proposed field-based products that translate results into actionable resources.

The application of these findings to public health practice is operationalized through four field-based products designed to translate evidence into actionable strategies. Field Product 1 is a policy brief memo (Appendix A) intended for public health leadership and policymakers, which summarizes key findings and provides recommendations for integrating trauma-informed approaches into cervical cancer screening programs. Field Product 2 is a community health intervention plan (Appendix B) that outlines trauma-informed strategies to increase screening engagement among women aged 18–65 years in South Carolina. Field Product 3 is a visual representation of the intervention framework (Appendix C), which illustrates the alignment between ACEs, trauma-informed strategies, and screening outcomes. Field Product 4 is a community-facing fact sheet (Appendix D) designed to support patient understanding, empowerment, and engagement with cervical cancer screening services.

Interpretation of Findings

Implications for Social Change

Findings from this study suggest that ACEs may be associated with cervical cancer screening behaviors, indicating that trauma histories may influence women's engagement with preventive health services. At the individual level, these findings highlight the importance of patient-centered, trauma-informed approaches that recognize the role of past experiences in shaping healthcare behaviors and may support women in making informed decisions about cervical cancer screening. Improving patient comfort, trust, and autonomy during preventive care encounters has the potential to enhance screening participation without attributing blame or noncompliance to individuals.

At the organizational level, the results support the integration of trauma-informed practices within cervical cancer screening programs and clinical settings, particularly those serving populations experiencing structural disadvantages. Incorporating ACE-informed training, trauma-sensitive communication strategies, and supportive care environments may help healthcare organizations reduce psychosocial barriers to screening and improve engagement among underserved women.

At the societal and policy level, these findings may inform public health efforts to expand cervical cancer prevention strategies beyond structural access alone by acknowledging the influence of early-life adversity on adult health behaviors. Integrating trauma-informed principles into public health programs and policies has the potential to promote more equitable preventive care delivery and reduce disparities in cervical cancer screening outcomes. Collectively, these implications support positive social change by

advancing preventive care approaches that are responsive to both psychosocial and structural determinants of health while remaining consistent with the scope and findings of this study.

Public Health Implications

This study reinforces the importance of conceptualizing ACEs as social determinants of health with potential downstream effects on preventive healthcare utilization. While ACE research has historically emphasized long-term chronic disease outcomes, the current findings indicate that ACE exposures may also relate to preventive behaviors such as pap test screening. Public health interventions in South Carolina may benefit from integrating trauma-informed principles into cervical cancer prevention programs, especially in strategies designed to improve screening uptake and reduce disparities.

At the community level, findings highlight the potential value of outreach approaches that address barriers beyond access alone. Women with trauma histories may face additional barriers including avoidance of medical environments, distrust of healthcare systems, and difficulty sustaining preventive routines. Community-based initiatives may improve screening participation by incorporating supportive messaging, peer-based education, and trauma-informed outreach strategies that emphasize autonomy, empowerment, and safety. Leveraging community health workers and trusted local organizations may be particularly important in high-need or historically underserved communities.

Clinical Practice Implications

The findings also have implications for clinical practice, particularly in women's health and primary care settings. Women with ACE exposure—especially those related to household substance use or mental illness—may experience heightened anxiety, vulnerability, or avoidance during gynecologic procedures. Trauma-informed care principles such as transparency, choice, and emotional safety may reduce distress and improve patient engagement with recommended screening guidelines. Providers trained in trauma-informed communication may be better positioned to recognize and address the ways trauma histories influence preventive health behaviors.

Additionally, clinic systems may consider structured approaches for supporting patients who experience barriers to screening participation. These approaches may include strengthened referral pathways to behavioral health and social services, as well as supportive workflows that normalize patient control during screening (e.g., offering procedure explanations, consent check-ins, and patient-directed pacing). Although routine ACE screening is not universally appropriate in all settings, sensitive inquiry and patient-centered communication may offer meaningful opportunities to strengthen trust and continuity of care.

Limitations of the Study

Several limitations should be considered in interpreting study findings. First, BRFSS data are self-reported and therefore subject to recall and social desirability biases, particularly for sensitive topics such as childhood adversity and screening behaviors. Second, the study used a cross-sectional design, which limits causal inference and

precludes conclusions about temporal ordering of ACE exposure and preventive screening decisions. The findings therefore reflect associations rather than causal relationships.

Third, ACE measures in BRFSS are constrained by available questionnaire items and may not fully capture trauma severity, chronicity, timing, or the broader range of adverse exposures that influence health behaviors. Fourth, Pap test screening was measured through participant report rather than medical record verification. Finally, although the analytic focus was on women in South Carolina, the findings may not be generalizable to women in other geographic regions or contexts where healthcare systems, population characteristics, and screening access differ.

Recommendations

Recommendations for Public Health Practice

Findings support the recommendation that public health programs and community interventions incorporate trauma-informed strategies into cervical cancer screening promotion. Programs designed to increase Pap test screening participation may be enhanced through messaging that recognizes fear, avoidance, and distrust as potential trauma-related barriers rather than individual noncompliance. Outreach strategies should emphasize autonomy, normalize screening discomfort and anxiety, and clearly communicate available supports.

Public health agencies may also consider integrating behavioral health support into cancer prevention initiatives, particularly in communities with a prevalence of trauma exposure. Multi-level approaches that combine education, screening navigation,

and resilience-building support may be more effective than approaches that focus solely on information dissemination or access.

Recommendations for Clinical Practice

Healthcare systems serving women's preventive health needs should consider expanding trauma-informed training and workflow support for cervical cancer screening encounters. This training may include best practices in consent-based communication, patient choice during gynecologic procedures, and strategies to reduce distress during screening. Clinics may additionally adopt structured screening navigation supports (reminders, follow-up outreach, supportive check-ins) to reduce attrition at the screening stage.

Clinical practice may further benefit from strengthened referral pathways for patients experiencing psychosocial barriers. While ACE identification should be approached with care and ethical safeguards, clinicians can improve preventive care engagement through trauma-sensitive inquiry, supportive education, and coordinated referrals that address emotional safety alongside clinical needs.

Recommendations for Health Policy

At the policy level, findings support recommendations to strengthen infrastructure for trauma-informed care within preventive health settings. Policy initiatives may include funding for workforce training, integration of behavioral health into primary care and women's health clinics, and broader supports that reduce structural barriers to screening participation (e.g., transportation assistance, flexible scheduling, childcare support, and expanded access through community clinics). Policies that prioritize equity-driven

preventive healthcare are particularly relevant in South Carolina, where disparities in screening and cancer outcomes persist.

Field-Based Products

As a DrPH field-based product, a Community Health Intervention Plan was developed to translate the findings of this study into an applied, community-level prevention strategy. The intervention plan is designed to increase cervical cancer screening participation among women in South Carolina who may underutilize Pap testing due to barriers associated with ACEs, particularly exposures related to household substance use and household mental illness. This intervention draws upon constructs from the Health Belief Model to align intervention components with key determinants of screening behavior, including perceived barriers, perceived benefits, cues to action, and self-efficacy. The full Community Health Intervention Plan and related informational materials are provided in Appendix A.

Policy Implications

From a policy perspective, the study supports expanding trauma-informed approaches within state cancer prevention programs, such as South Carolina's BCN. Public health agencies may consider integrating ACEs into risk stratification frameworks for cervical cancer screening outreach, ensuring that high-risk populations are not overlooked. Medicaid and other publicly funded insurance programs could also use these findings to justify reimbursement models that support trauma-informed care delivery, patient navigation, and integrated behavioral health in primary care and women's health clinics. At the systems level, these results contribute to the evidence base needed for

policies that link childhood trauma prevention with long-term health outcomes, reinforcing the case for multi-sector investments in family mental health and substance use support.

On a broader scale, this research supports policy initiatives that invest in preventive health equity and childhood trauma prevention. Expanding Medicaid coverage for preventive services, strengthening school- and community-based mental health programs, and embedding trauma-informed training into state health department initiatives are examples of policies that can address both upstream and downstream influences of ACEs. Recognizing the intersection between trauma, health behavior, and cancer prevention can guide resource allocation and policy development to reduce disparities in cervical cancer outcomes.

Implications for Future Research

This dissertation contributes novel evidence to the limited body of literature linking ACEs to preventive screening behaviors. Future studies should explore longitudinal relationships to assess causal pathways between ACEs and preventive service utilization. Further research could also examine potential mediating variables, such as healthcare access, trust in medical providers, or mental health status, to clarify mechanisms underlying the associations identified here. Expanding the analysis across multiple states or nationally would strengthen generalizability and inform cancer prevention strategies at the federal level. Finally, interdisciplinary research spanning public health, psychology, women's health, and health policy is warranted to translate these findings into actionable, cross-sector interventions.

This study examined the associations between ACEs and cervical cancer screening behaviors among women in South Carolina using 2020 BRFSS data. Findings revealed that ACE exposures, including living with someone who was mentally ill, a problem drinker, or a drug user, were significantly associated with Pap test screening within the past three years, even after controlling for sociodemographic factors. Importantly, results demonstrated that preventive screening behaviors are shaped not only by demographic characteristics such as income, education, and race/ethnicity, but also by the psychosocial context of early life.

By identifying ACEs as significant predictors of preventive healthcare utilization, this research expands the scope of trauma-informed public health practice. The study underscores the need for public health professionals, clinicians, and policymakers to recognize trauma histories as integral to women's health outcomes. In doing so, it highlights opportunities to integrate trauma-informed approaches into cancer prevention strategies, providing education, and state-level health programming.

The findings also point to broader implications for research, suggesting the value of longitudinal and multi-state analyses that can capture causal pathways and expand generalizability. Together, these insights provide evidence that early-life adversity continues to shape health trajectories into adulthood, influencing not only disease risk but also engagement in preventive healthcare.

This study contributes to the understanding of how ACEs may influence preventive health behaviors, specifically cervical cancer screening among women in South Carolina. The findings support continued efforts to advance trauma-informed and

equity-centered preventive healthcare approaches. By addressing both structural and trauma-related barriers to screening participation, public health and clinical stakeholders may strengthen cervical cancer prevention strategies, reduce disparities, and improve women's health outcomes across the lifespan.

Conclusion

This study examined the association between selected ACEs and cervical cancer screening behaviors among women aged 18–65 years in South Carolina, contributing to a deeper understanding of how early-life adversity may influence engagement in preventive health services. Findings suggest that psychosocial factors related to trauma may play a meaningful role in screening behaviors, even when structural barriers such as cost and access are addressed. These results underscore the importance of expanding cervical cancer prevention strategies to include trauma-informed and ACE-informed approaches that acknowledge the complex pathways shaping women's health behaviors.

This doctoral study demonstrates the synthesis of DrPH foundational and concentration-specific competencies through the design and execution of a quantitative, secondary data analysis using population-based surveillance data to address a relevant public health issue. The study applied theory-informed perspectives to examine preventive health behaviors, while critically analyzing the strengths and limitations of applying behavioral and ecological frameworks to complex, real-world public health challenges. Ethical considerations were addressed through the responsible use of deidentified secondary data, protection of confidentiality, and careful interpretation of findings to avoid stigmatization or overgeneralization.

The study further demonstrates the ability to communicate public health science to diverse stakeholders by translating findings into multiple field-based products tailored to policymakers, public health practitioners, healthcare organizations, and community members with varying levels of health literacy. Through the development of a policy brief memo, a community health intervention plan, a visual representation of the intervention framework, and a community-facing fact sheet, the findings were operationalized into actionable resources designed to influence practice and policy.

Consistent with these findings, this study proposes the integration of trauma-informed and ACE-informed principles into existing cervical cancer screening programs as a public health policy approach to improving preventive care engagement. Specifically, embedding trauma-informed training requirements and patient-centered communication standards within state-supported screening initiatives, such as the South Carolina BCN, could promote positive social change by reducing psychosocial barriers to screening and advancing equity in cervical cancer prevention.

References

- Alcalá, H. E., Mitchell, E., & Keim-Malpass, J. (2017). Adverse childhood experiences and cervical cancer screening. *Journal of Women's Health, 26*(1), 58–65.
<https://doi.org/10.1089/jwh.2016.5823>
- Alcalá, H. E., Mitchell, E., & Keim-Malpass, J. (2017). Adverse Childhood Experiences and Cervical Cancer Screening. *Journal of women's health (2002), 26*(1), 58–63.
<https://doi.org/10.1089/jwh.2016.5823>
- Alcalá, H. E., Mitchell, E., Keim-Malpass, J., & Adkins-Jackson, P. B. (2018). Adverse childhood experiences and cancer screening behaviors. *American Journal of Preventive Medicine, 54*(4), 529–537.
- American Psychological Association. (2018). Resilience. In *APA dictionary of psychology*. <https://dictionary.apa.org/resilience>
- Anda, R. F. (1999). The relationship of adverse childhood experiences to adult medical disease, psychiatric disorders, and sexual behavior. *American Journal of Preventive Medicine, 14*(4), 245–258.
- Anda, R. F., Brown, D. W., Felitti, V. J., Bremner, J. D., Dube, S. R., & Giles, W. H. (2007). Adverse childhood experiences and the risk of psychotropic medication use. *Journal of Clinical Psychiatry, 68*(7), 1029–1035.
- Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C., Perry, B. D., Dube, S. R., & Giles, W. H. (2004). The enduring effects of abuse and related adverse experiences in childhood. *European Archives of Psychiatry and Clinical Neuroscience, 256*(3), 174–186. <https://doi.org/10.1007/s00406-005-0624-4>

- Andersen, J. P., & Blossnich, J. (2013). Disparities in adverse childhood experiences among sexual minority and heterosexual adults. *PLoS ONE*, *8*(1), e54691. <https://doi.org/10.1371/journal.pone.0054691>
- Autry, J., & Mann, K. (2024). *Cervical cancer screening initiatives in South Carolina*. South Carolina Department of Public Health Report.
- Bellis, M. A., Hughes, K., Cresswell, K., & Ford, K. (2023). Comparing relationships between single types of adverse childhood experiences and health-related outcomes: a combined primary data study of eight cross-sectional surveys in England and Wales. *BMJ open*, *13*(4), e072916. <https://doi.org/10.1136/bmjopen-2023-072916>
- Benedetti, F., Poletti, S., Radaelli, D., Pozzi, E., Giacosa, C., & Smeraldi, E. (2014). Adverse childhood experiences and gender influence treatment seeking behaviors in obsessive-compulsive disorder. *Comprehensive Psychiatry*, *55*(2), 298–301. <https://doi.org/10.1016/j.comppsy.2013.08.028>
- Bhanot, S. (2021). Data preparation steps in research analytics. *Journal of Data Science Applications*, *4*(2), 88–94.
- Blumberg, S. J., & Luke, J. V. (2006). *Wireless substitution: Early release of estimates from the National Health Interview Survey*. National Center for Health Statistics.
- Brandford, A. A., Williams, E. N., Han, G., Weston, C., & Downing, N. R. (2023). Adverse Childhood Experiences and Preventive Cervical Cancer Screening Behavior. *Oncology nursing forum*, *50*(6), 679–691. <https://doi.org/10.1188/23.ONF.679-691>

- Bucci, M., Marques, S., Oh, D., & Harris, N. (2016). Toxic stress in children and adolescents. *Advances in Pediatrics*, 63(1), 403–428.
- Carmody, J. (2012). Trauma and addiction: The role of substance use in emotional regulation. *Journal of Substance Abuse Treatment*, 42(2), 123–130.
- Centers for Disease Control and Prevention. (2010). Adverse childhood experiences study. <https://www.cdc.gov/violenceprevention/aces/about.html>
- Centers for Disease Control and Prevention. (2021). Cervical cancer statistics. <https://www.cdc.gov/cervical-cancer/statistics/index.html>
- Centers for Disease Control and Prevention. (2022). Behavioral Risk Factor Surveillance System overview. <https://www.cdc.gov/brfss/index.html>
- Centers for Disease Control and Prevention. (2024). About adverse childhood experiences. <https://www.cdc.gov/aces/about/index.html>
- Centers for Disease Control and Prevention. (2025). About Violence Prevention. <https://www.cdc.gov/violence-prevention/about/index.html>
- Chrousos, G. P. (1997). The hypothalamic–pituitary–adrenal axis and stress. *New England Journal of Medicine*, 332(20), 1351–1362.
- Dong, M., Anda, R. F., Dube, S. R., Giles, W. H., & Felitti, V. J. (2003). The relationship of exposure to childhood sexual abuse to other forms of abuse. *Child Abuse & Neglect*, 27(6), 625–639.
- Dube, S. R., Felitti, V. J., Dong, M., Chapman, D. P., Giles, W. H., & Anda, R. F. (2003). Childhood abuse, neglect, and household dysfunction and the risk of illicit drug

use: the adverse childhood experiences study. *Pediatrics*, 111(3), 564–572.

<https://doi.org/10.1542/peds.111.3.564>

Dore, M. M., Doris, J. M., & Wright, P. (1995). Identifying substance abuse in maltreating families: a child welfare challenge. *Child abuse & neglect*, 19(5), 531–543. [https://doi.org/10.1016/0145-2134\(95\)00013-x](https://doi.org/10.1016/0145-2134(95)00013-x)

Dube, S. R., Anda, R. F., Felitti, V. J., Edwards, V. J., & Williamson, D. F. (2002). Exposure to abuse and household dysfunction among adults. *American Journal of Preventive Medicine*, 23(4), 268–277.

Edwards, V. J., Holden, G. W., Felitti, V. J., & Anda, R. F. (2003). Relationship between multiple forms of childhood maltreatment and adult mental health. *American Journal of Psychiatry*, 160(8), 1453–1460.

Ellis-Jacobs, B. (2011). Correlational research design in quantitative studies. *Educational Research Quarterly*, 35(1), 23–30.

Felitti, V. J., Anda, R. F., Nordenberg, D., et al. (1998). Relationship of childhood abuse and household dysfunction to many leading causes of death in adults. *American Journal of Preventive Medicine*, 14(4), 245–258.

Franke, H. A. (2014). Toxic stress: Effects and prevention. *Journal of Pediatric Nursing*, 29(5), 390–395.

Guetterman, T. C. (2019). Descriptive statistics in research. *Educational Researcher*, 48(5), 345–349.

Hanson, B. (2022). Logistic regression explained. *Journal of Statistical Methods*, 15(2), 88–102.

- Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *The Lancet. Public health*, 2(8), e356–e366. [https://doi.org/10.1016/S2468-2667\(17\)30118-4](https://doi.org/10.1016/S2468-2667(17)30118-4)
- Koball, A. M., Rasmussen, C., Olson-Dorff, D., Klevan, J., Ramirez, L., & Domoff, S. E. (2019). The relationship between adverse childhood experiences, healthcare utilization, cost of care and medical comorbidities. *Child abuse & neglect*, 90, 120–126. <https://doi.org/10.1016/j.chiabu.2019.01.021>
- LeDoux, J. (2000). Emotion circuits in the brain. *Annual Review of Neuroscience*, 23, 155–184.
- Machtiger, E. L., Cuca, Y. P., Khanna, N., Rose, C. D., & Kimberg, L. S. (2015). From treatment to healing: the promise of trauma-informed primary care. *Women's health issues : official publication of the Jacobs Institute of Women's Health*, 25(3), 193–197. <https://doi.org/10.1016/j.whi.2015.03.008>
- Mayo Clinic. (2024). Pap smear. <https://www.mayoclinic.org>
- Mayo Clinic. (2025). Cervical cancer. <https://www.mayoclinic.org>
- McEwen, B. S. (2007). Physiology and neurobiology of stress. *Physiological Reviews*, 87(3), 873–904.
- [One Place \(2022\)](https://www.oneplaceonslow.org/blog/bringing-the-five-protective-factors-to-life/). Bringing the Five Protective Factors to Life,”
(<https://www.oneplaceonslow.org/blog/bringing-the-five-protective-factors-to-life/>)

- Pierannunzi, C., Hu, S. S., & Balluz, L. (2013). A systematic review of publications assessing reliability and validity of the Behavioral Risk Factor Surveillance System (BRFSS), 2004-2011. *BMC medical research methodology*, *13*, 49. <https://doi.org/10.1186/1471-2288-13-49>
- QuestionPro Survey Software. (2025). <https://www.questionpro.com/blog/correlational-research>
- SAMHSA. (n.d.). Risk and protective factors. <https://www.samhsa.gov>
- South Carolina Department of Public Health. (2025). Best Chance Network annual report.
- Srivastav, A., Strompolis, M., Moseley, A., Daniels, K. (2020). The Empower Action Model: A framework for ACE prevention. *Journal of Public Health Management and Practice*, *26*(6), 577–584.
- Tarullo, A. R., & Gunnar, M. R. (2006). Child maltreatment and the HPA axis. *Development and Psychopathology*, *18*(3), 651–677.
- U.S. Cancer Statistics Working Group. (2024). U.S. cancer statistics data brief. (U.S. Department of Health and Human Services, Office of the Surgeon General, 2025)
- Wang, Y. (2021). Family-related adverse childhood experiences and self-rated health. *BMC Public Health*, *21*, 1432.
- Zarse, E. M., Neff, M. R., Yoder, R., Hulvershorn, L., Chambers, J. E., & Chambers, R. A. (2018). *The adverse childhood experiences questionnaire as a predictor of health outcomes. Child Abuse & Neglect*, *83*(1–10).

Zarse, Emily & Neff, Mallory & Yoder, Rachel & Hulvershorn, Leslie & Chambers, Joanna & Chambers, Robert. (2019). The Adverse Childhood Experiences Questionnaire: Two Decades of Research on Childhood Trauma as a Primary Cause of Adult Mental Illness, Addiction, and Medical Diseases. *Cogent Medicine*, 6(1-24). 10.1080/2331205X.2019.1581447.

Appendix A: Policy Brief Memo

Integrating Trauma-Informed Approaches into Cervical Cancer Screening Programs in South Carolina

To: South Carolina Department of Public Health Leadership; Best Chance Network
Program Administrators

From: Ashley L. Hamm, MPH, CHES, Doctor of Public Health Candidate

Date: February 3, 2026

Issue

Cervical cancer remains a preventable cause of morbidity and mortality, yet screening uptake among eligible women in South Carolina remains suboptimal, particularly among underserved populations. While programs such as the Best Chance Network (BCN) address structural barriers such as cost and access, less attention has been given to psychosocial barriers that influence screening behaviors. ACEs, including exposure to household substance abuse and mental illness, represent underexamined factors that may affect women's engagement in preventive healthcare services.

Evidence

Findings from a quantitative analysis of 2020 South Carolina BRFSS data demonstrate that specific ACEs are significantly associated with cervical cancer screening behaviors among women aged 18–65 years. Women who reported living with a household member who used illegal drugs had higher odds of being up to date with Pap testing, whereas women who reported exposure to household substance abuse involving alcohol and exposure to household mental illness had significantly lower odds of screening. These

findings suggest that trauma history may act as a behavioral barrier to screening for some women, even when services are available at no cost.

Policy Implications

Current cervical cancer screening initiatives primarily address logistical and economic barriers but may not sufficiently account for trauma-related avoidance, mistrust, or disengagement from healthcare. Without incorporating trauma-informed principles, screening programs may fail to reach women who are most at risk for delayed or missed preventive care. Integrating ACE-informed practices into existing programs may enhance patient engagement, improve screening adherence, and reduce disparities in cervical cancer outcomes.

Policy Recommendations

It is recommended that the South Carolina Department of Public Health and BCN integrate trauma-informed approaches into cervical cancer screening initiatives by:

1. Implementing ACE-informed training for healthcare providers and BCN staff to improve understanding of how childhood trauma influences preventive health behaviors.
2. Incorporating trauma-sensitive communication strategies into patient outreach and education efforts to reduce fear, stigma, and avoidance.
3. Partnering with behavioral health services to provide referral pathways for women with identified trauma histories.
4. Pilot testing trauma-informed screening protocols within BCN clinics to assess feasibility and impact on screening uptake.

Conclusion

Integrating trauma-informed approaches into cervical cancer screening programs represents a practical and evidence-based strategy to improve preventive care engagement among women in South Carolina. Addressing both structural and psychosocial barriers has the potential to increase screening participation, reduce cervical cancer disparities, and promote long-term positive public health outcomes.

References:

Centers for Disease Control and Prevention. (2020). Behavioral Risk Factor Surveillance System Survey Data.

Centers for Disease Control and Prevention. (2024). Adverse Childhood Experiences (ACEs).

Felitti, V. J., Anda, R. F., Nordenberg, D., et al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults.

Substance Abuse and Mental Health Services Administration. (2014). SAMHSA's concept of trauma and guidance for a trauma-informed approach.

Appendix B: “Safe to Screen”: A Trauma-Informed Community Intervention to Increase
Cervical Cancer Screening Among Women with ACE Exposure in South Carolina

Public Health Problem or Issue

Cervical cancer is largely preventable through routine screening (Pap testing and/or HPV testing) and timely follow-up care. Despite screening guidelines and prevention programs, cervical cancer screening participation remains inconsistent, particularly among women experiencing socioeconomic barriers and psychosocial stressors. One under-addressed barrier is trauma-related avoidance of clinical settings and gynecologic procedures.

ACEs are recognized as social determinants of health that contribute to long-term health risks and may also influence preventive health behaviors through pathways such as chronic stress, anxiety, medical mistrust, avoidance, low self-efficacy, and competing priorities. In South Carolina, persistent disparities in access and preventive care utilization underscore the need for interventions that address both structural barriers and trauma-related barriers to screening.

Summary of Study Findings and How Findings Inform the Intervention

This study examined associations between selected ACE exposures and cervical cancer screening behavior among women ages 18–65 in South Carolina using weighted BRFSS data. Findings suggested that some household dysfunction ACE exposures (including living with a problem drinker/alcoholic and living with someone who used illegal drugs) were significantly associated with being up to date on Pap testing after

controlling for covariates, while household mental illness did not demonstrate an independent association in adjusted models.

These findings indicate that trauma histories and household dysfunction exposures are relevant to women's health engagement patterns and should be considered in preventive service strategies. However, because screening behavior is multi-determined, the intervention is designed using the EAM as a multilevel approach that integrates protective factors and resilience-building strategies across the lifespan, consistent with the SEM (individual, interpersonal, institutional, community, and policy levels).

Policy and Systems Context

This intervention plan is informed not only by study findings related to ACE exposure and preventive screening, but also by the broader systems context affecting women's health services. Recent reductions and instability in community mental health and substance use funding may reduce supportive infrastructure that indirectly promotes preventive care engagement, including care coordination, referral support, and community-based navigation services. Because ACE-related outcomes may increase avoidance of clinical encounters and reduce perceived control over health behaviors, shifts in behavioral health capacity may further intensify barriers to routine Pap testing. As a result, the proposed intervention incorporates trauma-informed engagement strategies and low-barrier screening access support designed to improve screening uptake even in contexts where behavioral health services are limited or disrupted.

Population That Will Benefit

Primary Target Population

Women ages 21–65 living in South Carolina who are:

- overdue or inconsistently up-to-date on cervical cancer screening, and/or
- experiencing psychosocial barriers (anxiety, avoidance, mistrust), and/or
- residing in underserved communities with access barriers.

Secondary Target Population

- Community Health Workers (CHWs)
- Best Chance Network (BCN) partners and women’s health clinics
- Community-based organizations (CBOs), faith-based programs, social service providers
-

Framework/Theory/Behavioral Model

This intervention plan is based on the Empower Action Model (EAM), which combines:

- the Socio-Ecological Model (multilevel action),
- evidence related to ACEs and trauma impacts, and
- the Protective Factors Framework promoting resilience and health equity across the lifespan.

Key EAM/Protective Factor Domains Embedded

- Positive, stable relationships
- Safe, protective, equitable environments
- Healthy development of social and emotional competencies
- Empowerment and agency
- Trauma-informed systems and policy alignment
-

Core Intervention Overview

Safe to Screen SC is a multilevel, trauma-informed community intervention delivered over **8–12 weeks** through CHWs and community partners, with clinic linkage. It includes:

1. Trauma-informed screening education
2. Navigation and appointment support
3. Skills-building for self-advocacy in clinical settings
4. Provider and clinic workflow supports
5. Community reinforcement and systems support

EAM / SEM Level	EAM Construct / Protective Factor	Core Intervention Component	Mode of Delivery	Required Product Included?
Individual	Social-emotional competencies; self-regulation; empowerment	Screening Confidence Skills Session: coping tools for anxiety; what to expect during Pap;	1 workshop (45 min) + practice handout	—

EAM / SEM Level	EAM Construct / Protective Factor	Core Intervention Component	Mode of Delivery	Required Product Included?
Individual	Health knowledge; agency	grounding techniques; self-advocacy scripts Education Micro-Module: Pap/HPV basics, guidelines, myths, benefits	Short workshop segment + QR-coded mini video	—
Interpersonal	Positive relationships; peer support	Peer Support + Normalization: optional group discussion, women’s storytelling and stigma reduction	Support circle (30 min) after workshop	—
Interpersonal	Supportive caregiving networks	Support Person Prep: guidance for bringing a friend/support person	One-page add-on tip sheet	—
Institutional/Organizational	Trauma-informed systems; safe environments	Clinic Trauma-Informed Workflow Toolkit: consent check-ins, stop-signal, step-by-step explanations, patient choice menu	15-minute clinic huddle + toolkit	—
Institutional/Organizational	Access supports; service enhancement	Reserved Appointment Pathway: dedicated “Safe to Screen slots” in partner clinics	Clinic partnership and scheduling protocol	—
Community	Protective/equitable environments; cultural competence	Community Outreach Campaign: CHW outreach in trusted locations	Community sites (libraries, churches, events), social posts	—
Community	Access and opportunity	Mobile Screening Day / Transportation Supports	BCN clinic day or mobile unit + vouchers/resources	—
Policy	Systems-level supports; equity	Policy/Systems Brief: recommendations to BCN/DPH partners for trauma-informed cervical screening policies	1–2 page stakeholder brief	—

EAM / SEM Level	EAM Construct / Protective Factor	Core Intervention Component	Mode of Delivery	Required Product Included?
Cross-Cutting	Trauma-informed messaging; empowerment	Participant Fact Sheet: simple, supportive, autonomy-focused informational handout	Distributed at outreach + digital PDF	Required Fact Sheet

Note: The fact sheet is listed as a required intervention component and is included in Section A2.

Adaptation to Fit Community Needs and Context

This intervention will be adapted to South Carolina contexts by:

- using plain-language materials (6th–8th grade readability),
- providing culturally responsive, non-stigmatizing messaging,
- offering materials in English (and Spanish where appropriate),
- using CHWs who are trusted locally and familiar with community resources,
- embedding trauma-informed principles: safety, trust, choice, collaboration, empowerment, and cultural humility,
- partnering with established programs/clinics (e.g., BCN sites) to reduce access barriers.

What Success Would Look Like

Process Indicators

- participants reached through outreach
- participants attending workshop(s)
- navigation contacts completed
- appointments scheduled via CHW support
- clinic partners implementing “choice menu” workflow

Short-Term Outcomes (0–3 months)

- increased screening knowledge
- increased comfort/self-efficacy to attend Pap screening
- reduced anxiety/avoidance and shame associated with screening
- improved trust and perceived safety in the screening process

Primary Outcome (3–6 months)

- increase in completed Pap tests among participants who were overdue at enrollment (self-report and/or clinic confirmation if feasible)

Equity/Experience Outcomes

- improved patient experience: “felt in control,” “felt respected,” “felt safe”
- reduced missed appointments/no-shows among intervention participants (if clinics track)

Professional Practice and Implications for Social Change

Policy-level shifts and reductions in behavioral health and addiction services funding may indirectly influence cervical cancer screening uptake by weakening the supportive infrastructure that facilitates preventive care engagement. Women with higher ACE exposure may experience greater psychosocial and structural barriers to screening, including avoidance coping and reduced trust in healthcare systems. When behavioral health resources are reduced or disrupted, communities may lose care coordination, referral support, and navigation services that serve as pathways into preventive screening. This context reinforces the need for trauma-informed and low-barrier intervention strategies that improve Pap testing access and completion even when behavioral health capacity is constrained.

Recent changes in federal-level funding priorities for mental health and substance use services may further influence cervical cancer screening disparities among women with high ACE exposure. ACE-related outcomes—including depression, anxiety, PTSD symptoms, and maladaptive coping behaviors such as increased substance use—are known to affect preventive health engagement by increasing avoidance behaviors, reducing perceived self-efficacy, and intensifying competing demands (e.g., housing, employment, childcare, and crisis management). When community behavioral health systems experience funding reductions or program instability, the availability of supportive services that often function as “bridges” to prevention (e.g., care coordination, patient navigation, community outreach, crisis stabilization, and referral support) may decline. These system-level disruptions can worsen access barriers for routine screening

and reduce continuity in primary care relationships, which is particularly impactful for individuals with trauma histories who may already have low trust in healthcare systems.

This context reinforces the practical significance of implementing trauma-informed, low-barrier screening interventions. A key implication of this study is that cervical cancer prevention strategies should be designed to remain effective even when behavioral health capacity is constrained. Therefore, the proposed community health intervention emphasizes trauma-informed engagement, streamlined access to Pap testing, and supportive navigation strategies that do not rely solely on specialty behavioral health infrastructure, thereby strengthening sustainability and social change potential in communities facing shifting resource availability.

Sustainability and Adaptation Plan (Policy-Resilient Implementation)

To enhance feasibility and sustainability under changing community resource conditions, the intervention will incorporate the following policy-resilient strategies:

1. Low-barrier entry points: Offer multiple ways to initiate screening participation (e.g., in-person sign-up at clinics/community sites, phone enrollment, text-based scheduling).
2. Screening navigation supports: Use community health workers (CHWs), patient navigators, or trained outreach staff to assist with scheduling, reminders, and barrier resolution (e.g., transportation, childcare, work conflicts).

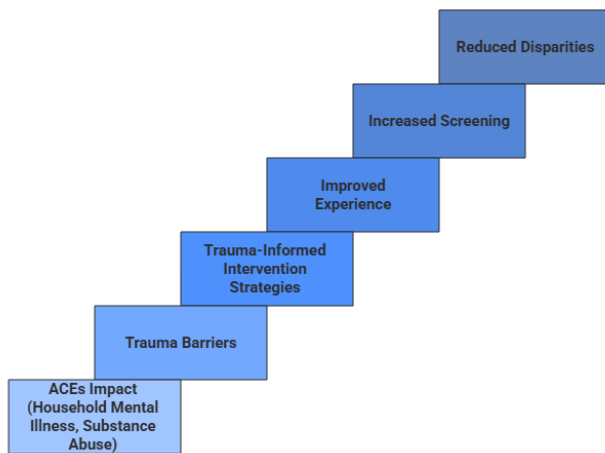
3. Trauma-informed appointment preparation: Provide a brief pre-visit script and educational handout emphasizing choice, consent, and patient control (e.g., option to pause/stop, ask questions, request a preferred provider when possible).
4. Streamlined referral pathways: When behavioral health services are available, implement a warm-handoff referral process; when unavailable, provide crisis hotline resources and self-regulation tools without delaying screening participation.
5. Flexible access options: Provide evening/weekend screening blocks or periodic “screening days” to reduce work-related barriers.
6. Community-based outreach integration: Coordinate outreach through trusted local partners (e.g., churches, community centers, women’s groups) to increase trust and reduce fear of clinical engagement.
7. Provider micro-training: Deliver brief trauma-informed screening training for clinical staff to improve patient experience and reduce avoidance (e.g., patient-centered language, grounding techniques, explaining each step before it occurs).
8. Transportation resource alignment: Leverage existing state/community transportation services when available (e.g., Medicaid transport) and maintain a small emergency resource list for low-income participants.
9. Minimal reliance on specialty behavioral health availability: Ensure intervention success does not depend on counseling capacity by prioritizing access design, patient empowerment, and navigation supports.

10. Monitoring and rapid adjustment: Track enrollment, appointment completion, and missed appointment reasons monthly to identify barriers early and adjust implementation procedures.

Appendix C: Trauma-Informed Framework for Improving Cervical Cancer Screening

Engagement

Achieving Improved Cervical Cancer Screening



Made with Napkin

Appendix D: Community Fact Sheet / Informational Sheet (Target Audience)

FACT SHEET (for participants)

SAFE TO SCREEN

A trauma-informed guide to Pap tests — you deserve healthcare that feels safe. If you've been putting off your Pap test, you are not alone. For many women, the idea of a Pap test can bring up anxiety, fear, discomfort, embarrassment — or even panic. If you've lived through trauma or hard experiences growing up, medical visits can feel even more stressful. This fact sheet is here to help.

What is a Pap Test?

A Pap test (Pap smear) is a quick screening that checks for changes in cervical cells that could become cancer. **It helps prevent cervical cancer.**

- ✅ Most of the time, the Pap test takes **less than 5 minutes**.

Why does screening matter?

Cervical cancer is one of the most preventable cancers — **when screening is done on time**. Pap tests can find cell changes early, before they become cancer.

Who should get screened?

General guidelines (always confirm with your provider):

Ages **21–29**: Pap test every **3 years**

Ages **30–65**: Pap test every **3 years** OR Pap + HPV test every **5 years** (options vary)

If you've been avoiding it... this is common (and valid – we get it!)

Some reasons women delay screening include:

- fear of pain or discomfort
- anxiety about being touched
- embarrassment or shame
- fear of bad news
- past trauma or negative medical experiences
- feeling out of control during exams
- distrust of providers or the healthcare system
- too much going on (work, caregiving, stress)

None of these reasons mean you're "noncompliant" or a "bad patient".

They mean you deserve care that fits your needs.

YOU ARE IN CONTROL: Trauma-informed options you can request

As a patient, it is your right to ask for:

- ✓ Step-by-step explanations before anything happens
- ✓ A slower pace (you can pause anytime)
- ✓ A support person in the room
- ✓ A provider of your preferred gender (when available)
- ✓ A "STOP" signal (hand raise or word)
- ✓ The smallest speculum available
- ✓ Extra lubrication
- ✓ A trauma-informed provider
- ✓ "Please tell me what you're doing before you do it."

Remember: You can stop the exam at any time.

Comfort and confidence tips (before your visit)

- Schedule at a time you are least stressed
- Practice a calming breath beforehand (4 seconds in, 6 seconds out)
- Bring headphones/music
- Ask for a short break during the visit
- Tell the provider:
“I’m anxious about this exam and I need extra support.”
- Ask CHW staff for help scheduling or preparing