5-2019

Correlates Between Childhood Trauma and Reproductive Health Behaviors Among Women in Appalachia

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A thesis

presented to

the faculty of the Department of Sociology and Anthropology

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Master of Arts in Sociology

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by

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May 2019

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Keywords: childhood trauma, reproductive health, birth control, Appalachia, physical abuse, verbal abuse, sexual abuse

ABSTRACT

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The lasting effects of childhood trauma into adulthood have been well corroborated by research from a variety of sources. Previous research has found a vast number of psychological, behavioral, and health related outcomes that are negatively affected by victimization in childhood. This piece strives to assess the correlates between childhood trauma and adult reproductive behavior and well-being for women living in Appalachia. The NCIPC has found that residents of Appalachia are at higher risks for both experiencing childhood traumas and poor health outcomes (2017). To create long-term positive reproductive health behaviors among Appalachian women, it is essential to examine how experiences with childhood trauma have affected these behaviors and how victims are likely to behave in adulthood in regards to their reproductive health. The results have implications for showcasing the unique difficulties experienced by women who were victims of childhood trauma which can impact the way healthcare providers and organizations can better assist the unique needs of this population.

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CHAPTER 1

INTRODUCTION

The Centers for Disease Control and Prevention (CDC) reported that in 2015, nearly 25% of children were the victims of child abuse with such incidents contributing to nearly 2,000 deaths (National Center for Injury Prevention and Control, Division of Violence Prevention [NCIPC] 2017). Such incidences have long-term effects on the wellbeing of victims. While many of the outcome pathways associated with childhood trauma have been explored, long-term reproductive healthcare practices associated with childhood trauma have been under-examined. It is essential that research examine the connections between childhood trauma and healthcare outcomes so as to help reduce negative health outcomes. This study seeks to examine the correlations between childhood trauma and reproductive healthcare outcomes, specifically to test the hypothesis that individuals who are victims of childhood trauma will be at a greater risk for negative reproductive healthcare outcomes, and will be less likely to be independent decision makers regarding reproductive behaviors.

CHAPTER 2

LITERATURE REVIEW

The CDC labels all forms of abuse and neglect of children child maltreatment (NCIPC 2017). They further classify maltreatment into the categories of physical abuse, sexual abuse, emotional abuse, and neglect (NCIPC 2017). They report that nearly 25% of children will be victims, and that the United States' government spends over 100 billion dollars a year on maltreatment (NCIPC 2017). Research conducted by the Department of Health and Human Services (DHHS) found the prevalence rate of childhood maltreatment to be 11% (DHHS 2017). Rates are notoriously underreported, and rates of incidence are reported to medical professionals approximately 52% of the time (DHHS 2017).

Trauma is often measured via adverse childhood experience (ACE) scales, which measure the number of incidences, the perpetrators of such incidences, and their impact (Dube, Shanta, Anda, Felitti, Edwards, and Williamson 2002). ACE scales often measure incidences of verbal, physical, and sexual abuse; neglect; and rates of household substance use, mental illness, separation and divorce, and incarceration (Dube et al. 2002). The most commonly used childhood trauma questionnaire is a seventy-item self-administered inventory called the Childhood Trauma Questionnaire (CTQ) (Bernstein, Stein, Newcomb, Walker, Pogge, Ahuvalia, Handelsman, Medrano, Desmond, and Dule, 2003). This inventory measures childhood trauma along continuous dimensions of frequency, severity, and duration (Bernstein et al. 2003). It does not conceptualize trauma as dichotomous, which provides a more accurate picture of childhood trauma (Bernstein et al. 2003). The CTQ is just one version of measuring ACE. The CDC created and utilized the Kaiser ACE scale, which is a 68 question ACE scale and is similar to the CTQ (CDC 2016). The CDC found that the Kaiser scale although effective at measuring ACE

can be off-putting for respondents because of its length and lead to respondents not answering all of the question. For this reason, the CDC created the Behavioral Risk Factor Surveillance System Survey (BRFSS) which is a condensed version consisting of 11 questions (CDC 2016). Through rigorous testing, the CDC has determined that the BRFSS is just as successful at measuring ACE as the long-form Kaiser scale. The questions included in the Women in Appalachia survey, from which the data analyzed here were collected, are the exact questions included in the CDC's BRFSS ACE scale (Appendix 2). This scale was selected because it asks about adverse childhood experiences in a simplified way that both provides information needed while reducing respondent burden.

Certain forms of trauma, specifically verbal and psychological abuse, are the most frequent forms of trauma, and are often precursors to physical violence (Rogers and Follingstad 2014). In families where trauma occurs, it is highly likely that multiple types will occur (Springer et al. 2003). Additionally, studies have found that witnessing trauma in the home can be just as detrimental to wellbeing as being the victim for children (Dube et al. 2002). Females are more likely to be victims than males especially in lower income households or single father families, and female victims often have greater impairments as a result of such incidences than males (Griffin and Amodeo 2010; Springer, Sheridan, Kuo, and Carnes, 2003; Walsh, Latzman, and Latzman 2014).

Trauma poses many long-term detrimental health effects for victims and witnesses, and often leads to poor healthcare outcomes in adulthood (Cannon, Bonomi, Anderson, Rivara, and Thompson, 2010; Dube et al. 2002; Rogers and Follingstad 2014). Victims and witnesses of truama have higher rates of depression, anxiety, eating disorders, post-traumatic stress disorder (PTSD), chronic pain, and chronic fatigue (Springer et al. 2003; Wilson and Spatz-Widom

2008). Victims and witnesses are also more likely to engage in high-risk behaviors like smoking, drinking, illegal drug use, and unsafe sex (Griffin and Amodeo 2010; Springer et al. 2003; Walsh, Latzman, and Latzman 2014; Wilson and Spatz-Widom 2008). These high-risk behaviors are more likely to occur because victims and witnesses tend to be more impulsive since they are often less inhibited, have poorer interpersonal skills, and poorer emotional control (Goodwin, Browne, Hing, and Russell 2017). Witnessing trauma is just as risky and leads to as many poor health outcomes as victimhood (Cannon et al. 2010). Some research has found that female victims and witnesses of trauma have higher usage rates for healthcare services than females who had not experienced trauma, but that they are also more likely to rely on emergency care than primary or preventative care (Cannon et al. 2010).

Childhood sexual abuse has more long-term negative consequences than other forms of abuse or neglect (Lemieux and Byers 2008; Rodriguez-Srednicki 2008; Wosu, Gelaye, and Williams 2015). Childhood sexual abuse is commonly defined as the involvement of a child in developmentally inappropriate sexual activity that the child does not fully comprehend and in which the child does not give consent or is unable to give consent (Wosu et al. 2015). Sexual abuse can be broken down into three categories: (1) non-contact sexual abuse: exhibitionism, sexual harassment, and voyeurism; (2) contact sexual abuse without penetration: non-genital fondling, kissing, genital touching; and (3) contact sexual abuse with penetration: anal, oral, or vaginal intercourse (Wosu et al. 2015). Childhood sexual abuse is typified in terms of frequency, duration, age of onset, and the relationship between the victim and the perpetrator (Wosu et al. 2015). Childhood sexual abuse is serious and widespread among females with prevalence rates ranging from 15% to 33% for the general female population and 35% to 75% in clinical samples of females (Lemieux and Byers 2008; Wosu et al. 2015). Additionally, childhood sexual abuse

commonly co-occurs with one or more other types of abuse or neglect (Lemieux and Byers 2008; Wosu et al. 2015). The majority of victims report multiple incidences of sexual contact prior to the age 13, with 61% of victims self-reporting that the abuse involved attempted or complete intercourse (Lemieux and Byers 2008). Childhood sexual abuse is correlated with higher rates of adult self-destructive behaviors, poor anger management skills, poor self-esteem, impaired self-conception, substance abuse, more interpersonal problems, and revictimization (Lemieux and Byers 2008; Maniglio 2009; Rodriguez-Srednicki 2008). Health problems of child sexual abuse victims include paranoid ideation, depression, anxiety, dissociation, eating disorders, personality disorders, suicidal ideation and attempts, chronic pelvic pain, and non-epileptic seizures (Lemieux and Byers 2008; Maniglio 2009). In women, childhood sexual abuse increases risk of early menarche, teenage pregnancy, substance abuse during pregnancy, and preterm births (Wosu et al. 2015).

Studies have also found high rates of dissociation being associated with having been the victim of trauma during childhood (Rodriguez-Srednicki 2008; Zurbriggen and Freyd 2004). Research has found that the frequency, duration, and extent of amnesia associated with trauma depends of the degree (specifically duration, frequency, and severity) of the trauma, leading to the discovery that victims of sexual abuse during childhood are more likely to suffer from amnesia or dissociation in adulthood because of the trauma they faced during childhood (Zurbriggen and Freyd 2004). Childhood sexual abuse increases the risk of an individual developing dissociations in childhood and continuing to engage is dissociative behaviors as a defense mechanism in adulthood (Rodriguez-Srednicki 2008). It is important to provide victims of sexual abuse with physical and mental health care as a means of positive recovery so as to limit the likelihood of adult dissociation which is often correlated with higher rates of self-

destructive behaviors like substance use and abuse, self-mutilation, engaging in risky sex, and suicide attempts (Rodriguez-Srednicki 2008).

Victims of childhood sexual abuse are more likely to engage in maladaptive sexual practices then peers who have not been victimized. Theses maladaptive practices include sexual avoidance, casual sex, sexual compulsivity, more sexual partners, low condom and birth control use, and unprotected sex (Lemieux and Byers 2008; Zurbriggen and Freyd 2004). Additionally they are more likely to report increased rates of sexual dysfunction as well as self-reporting sexual relationships as more negative (Zurbriggen and Freyd 2004). They also tend to hold lower expectations for sexual relationships and have lower sexual self-esteem (Zurbriggen and Freyd 2004). Victims have also been found to have a more difficult time freely consenting to sexual activities in adulthood than non-victims. Consensual sex can only be possible when external forces are not at play and consensual sex decision mechanisms are fully functioning in the brain (Zurbriggen and Freyd 2004). Victims are more likely to be further victimized in adulthood. Childhood sexual abuse has also found to limit the victims ability to distinguish between reality and fantasy as well as making it more difficult to assess the trustworthiness of others (Zurbriggen and Freyd 2004).

Healthy lifestyles are associated with better health and higher levels of life satisfaction (Goodwin et al. 2017). Self-esteem has proven to be one of the largest mediators associated with long-term outcomes for abuse victims (Lemieux and Byers 2008). Other mediators include self-efficacy, sexual assertiveness, and low gender rigidity (Zurbriggen and Freyd 2004). Mediators that decrease the likelihood of long-term negative outcomes include membership in clinical abuse populations, better adjustment skills, and more positive family circumstances and well-being (Maniglio 2009). Routine gynecological healthcare is essential because it provides

opportunities for meaningful discussions on ways to engage in safe sexual behavior, as well as breast and cervical cancer screenings (Short, Oza-Frank, and Conrey 2012). Additionally, victims need access to long-term monitoring services and care, which can help mediate the negative effects of being the victim of childhood trauma (Maniglio 2009).

Preconception care is another essential facet of reproductive healthcare. It is focused on reproductive well-being that is engaged in before a woman gets pregnant. Women who have been victims of childhood sexual abuse need to be identified via preconception care because they are at greater risk for a variety of gynecological and obstetric issues that require increased health care needs particularly when pregnant (Maniglio 2009).

The region of Appalachia is at even higher risks for trauma and the resulting adverse health outcomes (Bailey and Daugherty 2007; Short et al. 2012). Appalachia has higher rates of poor health outcomes than the rest of the nation and this has been correlated with the region having lower income, lower educational attainment, geographic isolation, lack of health insurance, and lack of healthcare facilities (Short et al. 2012). These factors are also correlated with increased risk of trauma (NCIPC 2017). Women in Appalachia are at even greater risk than men for both victimization and witnessing trauma during childhood, as well as the associated poor health outcomes like lower rates of health insurance, worse self-rate health, lower usage of preventative or primary care, more adverse outcomes during pregnancy, and higher prevalence of engaging in high-risk behaviors (Short et al. 2012). These issues are exacerbated by an overall lack of healthcare in the region and lower usage rates for preventative services, delays in seeking care, and poorer overall health statuses (Short et al. 2012). To further complicate this women have increased risk because the region is greatly underserved by obstetric and gynecological

providers, as well as having higher rates of tobacco and alcohol usage, poorer diets, and higher rates of obesity (Short et al. 2012).

Appalachian women are often faced with the overlapping concerns of trauma, health, and the ways these issues intersect. This results in long-term negative health outcomes because this population is more likely to suffer from a variety of diseases and is more likely to engage in high-risk behaviors (Cannon et al. 2010; Dube et al. 2002; Maniglio 2009; Springer et al. 2003). The direct effects of childhood trauma on adult reproductive behaviors are relatively under-researched particularly in regards to the various types of abuse that comprise the ACE scale (Appendix 2). It is important to examine potential correlations as a means of increasing reproductive well-being especially for those who are witnesses or victims of trauma because they are at greater risk for poor health outcomes and increased rate of engagement in high-risk behaviors. Furthermore, by looking at the individual components that comprise the ACE scale, instead of taking them all together, it is possible to see which forms of trauma have the greatest effects on reproductive health outcomes, which would not be distinguishable if looking at the scale as a whole.

CHAPTER 3

METHODS

Data

This study analyzes data collected from the study Medical Decision Making in Southern Appalachia: The Social and Technological Mechanisms that Impact Health & Wellness in Southern Appalachian Families study that was conducted by Dr. Kelly Foster at East Tennessee State University (ETSU) between April 21, 2016 to May 13, 2016. The data collection was funded by an ETSU Research Development Committee grant. The sample consisted of 471 women in south-central, central, and southern Appalachia. Encompassed in this region are Alabama, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. There are approximately 25 million individuals living in this region with nearly 75% of the population being over 18 years of age (Appalachian Regional Commission [ARC] 2019). In order to be eligible for the study, respondents had to live in a county in the designated region, be over 18 years of age, and female to participate in the study. Additionally, they were required to be the primary or joint decision maker for medical decisions in their household. The study was conducted over the telephone with live interviewers asking respondents the questions. The sample was dual-frame, land and cell connectivity with a 60:40 split of land to cell phones. This method was undertaken to try to account for areas with poor cell coverage. Respondents were given a ten-dollar gift card for completing the study. The data set had been previously cleaned making further cleaning or removal of outliers unnecessary.

Survey Instrument

For measure adverse childhood experiences (ACE), this survey utilized the ACE scale that is used for the Behavioral Risk Factor Surveillance System Survey (BRFSS). This scale is a

condensed form of the Kaiser ACE scale that is optimized for phone delivery. The Kaiser ACE scale is composed of 68 questions used to measure childhood abuse, neglect, home issues, and socio-behavioral factors. Both of these scales, Kaiser and BRFSS, have been created and tested by the CDC. The BRFSS is condenses the Kaiser scale from 68 questions to 11 questions. Through rigorous testing and use of the BRFSS by the CDC, they have been able to examine the effects of ACE on long-term health outcomes. Additionally, the CDC estimates that two-thirds of adults report one or more adverse childhood experiences. Due to their rigorous testing, both the Kaiser scale and the BRFSS are considered the gold standard for measuring ACE. In recent years, the BRFSS has over-taken the Kaiser scale in use because it is less overwhelming for respondents and has higher completion rates (CDC 2016). Because of the rigorous testing and continued strength associated with the BRFSS, it was used to measure ACE in this study (Appendix 2). The Women in Appalachia study also included questions on physician distrust, access to medical care, reproductive behaviors and healthcare, technology usage, and Appalachian identity.

Dependent Variables

Reproductive wellbeing variables, asked in a series of six questions, were used as the dependent variables. These variables asked about visiting health care facilities for reproductive health services, speaking with a health care provider about sexual behavior, and using birth control. These variables were measured based on respondent response to the questions either yes or no. There are also three variables measuring whether an individual makes a decision alone or has someone else make the decision or jointly makes the decision for issues of reproductive health care, when and how they have sex, and birth control usage. For these variables, response options were you alone or someone else/jointly with someone else.

Independent Variables

Two scales and two indicators were used to examine childhood traumas and were included in analysis as independent variables. In the survey, these questions were prefaced by an introduction telling respondents that these questions should be answered based on childhood experiences. The scales are for home issues and sexual abuse, while indicators of physical and verbal abuse were used. For the home issues scale, respondents fall on a scale of 0 to 6 where larger values indicate more issues present in the home. The sexual abuse scale also contains values 0 through 6 with 0 indicating no sexual abuse and 6 indicating the greatest level of victimization. The physical and verbal abuse indicators are measured by the presence of absence of physical or verbal abuse with no abuse being '0' and abuse being '1.' By considering home issues, sexual abuse, physical abuse, and verbal abuse as independent variables instead of combining them to form a singular Adverse Childhood Experience score, it ensures that one area of trauma is not suppressed by the others. It also makes it possible to distinguish which types of trauma impact reproductive health outcomes the most.

Control Variables

Six demographic variables were used as control variables in the regression analysis. These variables were essential for the regression models because including these variables in the models control for their effects on the other variables and their relationships. The control variables included measures on political affiliation (with categories ranging from very conservative to very liberal), income (categories from less than $15,000 to greater than $100,000), religious affiliation (either Christian or other), race or ethnic identify (white or other), highest level of education completed (categories from did not complete high school, no GED to

doctoral degree (Ph.D., Ed.D., D.S.W.), and marital status (married or single). All of these factors are known to have an impact on reproductive health behaviors.

Analytic Strategy

Outcomes are presented in six binary logistic regression models (presented in tables 3 through 8). Binary logistic regressions are being used because the responses to the survey questions have been condensed into binary categories. This test is appropriate because the dependent and independent variables are all categorical. The responses are also discrete, so no respondent can fall in multiple categories for any of the questions. The models each show a separate dependent variable measured along all of the independent variables and the constants. The tables report the unstandardized coefficients, which predicts the dependent from the independent, the Wald chi-square and its associated two-tailed significance, the odds ratio, reported as Exp(B), and the lower and upper bounds of a 95% confidence intervals for the odds ratio. Model summaries are presented at the bottom of each table for each individual logistic regression and include the -2 Log Likelihood, Cox and Snell R Square, and Nagelkerke R Square. Because of the small sample size, significances are reported at both the .05 and .1 levels, assuming that a larger sample size might make those that are currently significant at the .1 level more significant.

CHAPTER 4

RESULTS

Descriptive Statistics

The descriptive statistics (seen in Table 1) shows the mean or percentage of respondent answers. Scales were constructed for home issues and sexual abuse. The home issues scale include living with anyone who was depressed, mentally ill, or suicidal, living with a problem drinker or alcoholic, living with an illegal street drug user or prescription drug abuser, and living with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility. This scale had a Cronbach's Alpha of .662, meaning that the scale has an acceptable level of internal consistency and is reliable. The sexual abuse scale combines variables measuring if an adult ever touched the respondent sexually, if an adult ever forced the respondent to touch them sexually, or if the respondent was ever forced by an adult to have sex. This scale had a Cronbach's Alpha of .885 so it has high internal consistency and is very reliable.

Bivariate Analyses

Independent Samples T-Tests were conducted to examine whether there was a relationship between the independent (childhood trauma) and dependent variables (reproductive health outcomes) (presented in table 2). There were no significant differences for whether or not the respondent had visited a health care facility or other place to get sexual and reproductive health services in the last year across all of the independent variables. On average, there was a significant difference in whether a respondent had discussed their sexual behaviors with a health care professional in the past year, with those who had (M = .1316, SE = .01831) having experienced less physical abuse than those who had not (M = .2951, SE = .05888), $t(72.041) = 2.652$, $p < .05$. There was also a significant difference in whether a respondent had discussed

their sexual behaviors with a health care professional in the past year, with those who had (M = .2749, SE = .02418*)* having experienced less verbal abuse than those who had not (M = .4098*, SE* = .06349), $t(73.37) = 1.987$, $p < .05$. A significant difference existed between who makes decisions about your reproductive health, with those who made decisions alone (M = .3188, SE = .02609*)* having experienced more verbal abuse than those respondents who identified someone else as making decisions regarding their reproductive health (M = .2289*, SE* = .0464), $t(138.501) = 1.688$, $p < .1$. No significant difference was present for who decides when and how a respondent has sex across all of the independent variable. Those who made decisions about birth control by themselves are significantly more likely to have experienced sexual abuse (M = .6852, SE = .09958) than those who had someone else make the decision for them (M = .3529, SE = .11289), $t(260.182) = 2.207$, $p < .05$. Victims of verbal abuse were also more likely to make decisions regard birth control by themselves (M = .3262, SE = .02797) compared to those who had someone else make the decision (M = .233, SE = .04186), $t(199.08) = 1.852$, $p < .1$. For birth control use, those who had experienced more home issues (M = 3.6557, SE = .05308) were less likely to use birth control compared to those who had not experienced home issues (M = 3.3387, SE = .15417), $t(76.126) = -1.944$, $p < .1$. Those who had experienced verbal abuse (M = .3968, SE = .06213) were, however, more likely to use birth control than those who had not experienced verbal abuse (M = .2807, SE = .02433), $t(82.125) = 1.74$, $p < .1$.

Regression Models

The binary logistic regression models meet the assumptions necessary to assure that they are the proper test for this data. The assumption of linearity requires that the outcome variables are all categorical which is the case for the data used in these regressions. Graphs of the observed versus the predicted probabilities created in SPSS prove that there is independence of

errors. The unique assumptions of logistic regression are also met because all of the cells have values (which is necessary to meet the assumption of having complete information), the outcome variables cannot be perfectly predicted (meeting the assumption of complete separation), and the observations are not correlated so the variance is not significantly larger than expected from the model (which meets the assumption of over-dispersion).

The binary logistic regressions (Tables 3-8 in Appendix 1) show limited statistical significance between childhood trauma and reproductive health outcomes. Because of the small sample size, significance has been denoted at both the .05 level and the .1 level with the assumption that a larger sample size may garner the values significant at the .1 level more appropriately.

The regression model between visiting a facility for reproductive healthcare across all independent variables and controls show no significant differences (Table 3). In the regression model for speaking to a healthcare provider about sexual behavior the only significant relationship was with the physical abuse indicator (Table 4). The odds of speaking to a healthcare provider about sexual behavior were 61.2% lower for individual who had experienced physical abuse when controlling for racial and ethnic identity, highest level of education completed, religious affiliation, income, marital status, and political affiliation (z^2=5.318, p=.021).

Whether a woman makes reproductive health decisions alone or if someone else makes those decisions jointly or entirely there were significant relationships with physical abuse, marital status, and income (Table 5). This model shows a positive relationship between reproductive health decision-making and physical abuse. The odds of making decisions about one's reproductive health alone was three times higher for those that had experienced physical

abuse when controlling for marital status, racial or ethnic identity, highest level of education completed, religious affiliation, income, and political affiliation (z^2=6.659, p=.01). There is also a positive relationship between reproductive health decision making and income with making decisions about reproductive health alone increasing by 18.3% for every increase in income when controlling for marital status, racial or ethnic identity, highest level of education completed, religious affiliation, and political identity (z^2=5.567, p= .018). There is a negative relationship between reproductive health decision making and marital status, where those who are married are 87.6% less likely to make reproductive health decisions alone (z^2=19.987, p=.000).

The regression analysis for predicting the effects of childhood trauma on whether a woman makes decisions about engaging in sexual activity independently or dependently shows four significant relationships (Table 6). The odds of making decisions about engaging in sexual activities alone are 20.4% lower for individuals who had experienced home issues when controlling for racial or ethnic identity, marital status, highest level of education completed, religious affiliation, income, and political affiliation (z^2=3.453, p=.063). Respondents who identified as married were 75.6% less likely to make decisions about engaging in sexual activities alone when controlling for race or ethnic identity, religious affiliation, highest level of education completed, political affiliation, and income (z^2=31.838, p=.000). Those who identified as very conservative were 13.4% less likely to make decisions regarding engaging in sexual activities alone, when controlling for religious affiliation, race or ethnic identity, marital status, highest level of education completed, and income (z^2=4.107, p=.043). Every increase in income, a respondent is 11.6% more likely to make decisions about engaging in sexual activities

alone, when controlling for religious affiliation, race or ethnic identity, marital status, highest level of education completed, and political affiliation (z^2=3.363, p=.067).

There are significant relationships between whether a woman makes decisions about birth control alone or if the decision is made jointly and childhood trauma associated with verbal abuse, physical abuse, and sexual abuse (Table 7). The odds of making decisions about birth control alone were 46% lower for individuals who were victims of verbal abuse (z^2=3.194, p=.074). There is a positive relationship between the physical abuse and who makes decisions about birth control where the odds of making decisions about birth control alone are two times higher for those who had experienced physical abuse (z^2=6.618, p=.01). There was also a negative relationship between sexual abuse and who makes the decision about birth control with those who had been the victim of sexual abuse being 17.7% less likely to make the decision alone (z^2=3.242, p=.072). There was only one significant relationship between whether a respondent uses birth control (Table 8). There is a negative relationship between race and use of birth control where whites have 33% lower odds of using birth control than those identifying as another race or ethnic identity (z^2=7.941, p=.005).

The largest concern presented across these binary logistic regressions is that the models do not have a great fit. The Nagelkerke R Square shows how much variance is explained by the model. The larger the size of the Nagelkerke R Square the better the fit of the model. The best fitting model is that predicting the effects of childhood trauma on if a woman makes reproductive health decisions alone or if someone else makes or jointly makes the decision. The Nagelkerke R Square of this model is .218, so the model accounts for 21.8% of the variance. The worst fitting model is that predicting the effects of childhood trauma on if a woman visits a

facility for reproductive healthcare in which the Nagelkerke R Square was .032 which means that the model only accounted for 3.2% of variance.

CHAPTER 5

DISCUSSION

Findings suggest that there may be some correlation between childhood trauma and poor reproductive health outcomes. The dilemma is that such findings cannot be confirmed because of the minimal findings in this analysis that were statistically significant. Additionally, the models did not fit well across the board. The best means for increasing confidence in the limited findings would be to obtain a larger sample. The region has an adult population of approximately 25 million, and if one was to approximate that half of the population is female (12.5 million) and were to measure it at a confidence level of 95% with a margin of error at plus or minus 3%, better statistical findings would be available if the sample size was 1,067. The findings show agreement with current literature, and imply the potential of an overall significant relationship between childhood trauma and poor long-term reproductive health outcomes. Furthermore, these findings fail to reject the null hypotheses that childhood trauma does not lead to poorer reproductive health outcomes.

Physical abuse victims were found to be less likely to speak to healthcare providers about sexual behavior but more likely to make decisions regarding reproductive health decisions and decisions about birth control alone. There are several reasons why this may be the case. These victims may feel less comfortable speaking up because in the past things that they said or did that were construed by an adult in the home as 'wrong' may have led to their victimization (Spring et al. 2003). They may be more inclined to make reproductive health decisions alone because their history of abuse has led to be distrustful of others and feel as though they can only count on themselves (Goodwin et al. 2017). Because these women have been the victims of physical abuse, they are already vulnerable for poor health outcomes and being victimized again in

adulthood. By being less likely to speak to a healthcare provider but more likely to make reproductive health decisions, these women may be poorer decision makers because they are less informed or do not have the expertise of healthcare providers to assist in their decision making process.

Both verbal abuse victims and sexual abuse victims are less likely to make decisions about birth control alone. This may occur for verbal abuse victims because these victims may be more likely to have long-seated feelings that they cannot do anything right which results in their over-reliance on others assistance in decision making because they do not feel confident in their own abilities (Goodwin et al. 2017). Sexual abuse victims may be less likely to make decisions about birth control alone because of long-term misunderstanding or inaccurate knowledge related to sexual behaviors and actions. They are also more likely to continue to engage in maladaptive sexual practices or high-risk sexual behaviors because of their abuse, and that might translate into not caring as much about their reproductive health leading them to be okay with other people making decisions about their reproductive health for them (Lemieux and Byers 2008). These victims are unlikely to have be able or allowed to make decisions about birth control usage during the time of their abuse, which may have resulted in residual feelings of being unworthy or incapable of making these decisions now (Lemieux and Byers 2008; Zurbriggen and Freyd 2004).

Individuals who experienced home issues during childhood are less likely to make decisions about engaging in sex alone. These victims may also feel uncertain in their abilities to make decisions or know what decisions are the 'right' decisions (Dube et al. 2002). Home issues victims are also more likely to be people pleasers which may also result in their need to submit to the will of others or not stand up for themselves (Dube et al. 2002).

Reproductive rights are an ongoing concern in Appalachia and across the United States. There are 61 million women in the United States that are considered to be within the normal range for reproduction, and of these women, 70% are at risk of unintended pregnancy, and 10% of this same population do not use any form of contraception (The Guttmacher Institute 2018). Reproductive health tends to be overly politicized especially in rural, conservative areas. To ensure that women across the region are able to making decisions regarding their reproductive health without other forces, like intimidation and bias, coming into play. Reproductive justice can only exist where it is ensured that birth control, safe abortion, prenatal and obstetric care, and unbiased accurate presentation of information are accessible to all women. The conservative nature of Appalachia may explain why access to and knowledge regarding reproductive health is less available in the region. Data has also shown that unintended pregnancy and disuse of contraception is more prevalent in areas at an economic disadvantage (The Guttmacher Institute 2018). Across the country, most contraceptive services are provided by private practitioners, however, in Appalachia most women rely on publically funded or government run clinics for contraceptive and reproductive healthcare (Frost and Lindberg 2019). In the United States, twelve states allow providers to refuse to provide contraceptive health care, and not surprisingly, five of these states have Appalachian counties and populations (The Guttmacher 2019). Additionally, women are less likely to independently make decisions about their own reproductive wellbeing in the region, which may be correlated with the region having some of the lowest rates of contraceptive use in the nation and the highest for childhood trauma (Douglas-Hall, Kost, and Kavanaugh 2018). Furthermore, in Appalachia, the second most common form of contraception is female sterilization (Douglas-Hall et al. 2018).

As long as women in Appalachia are prevented from making reproductive health decisions for themselves, they will be unable to obtain a semblance of gender equality. It is essential that researchers' strive to obtain more information about reproductive wellbeing among women in the region, because that houses the potential to increase self-esteem and gender equality in Appalachian communities. By determining what factors, past or present, impact how women make reproductive healthcare decisions, and can thus help to better develop resources and programs that can reach a larger audience is in the most effective way possible. Moving forward, if Appalachia hopes to close the gap in gender inequality, it will have to start with reproductive rights allowing women to make choices about their health without outside pressures. To do this, it is necessary to examine potential correlates of reproductive well-being and care among Appalachian women, which allows these problems to better addressed in the future.

There are several limitations to this study that future research should work to address. One limitation is the sample size. For the region of Appalachia from which the population was drawn, the sample size was not large enough to ensure that the appropriate confidence interval is obtained. The largest concern with this research is the risk of unreliable measure because of the reliance of self-reporting. Self-reporting can result in respondents over or under reporting incidences because of inaccurate memories. Additionally, when studying trauma, there may be a higher likelihood of respondents having repressed memories of trauma that they experienced in childhood. Underreporting or inaccurate reporting may also be more prevalent in this study because the survey was conducted over the phone with a live interviewer. Use of interviewers can create interviewer effects whereby respondents answer questions in a particular way, whereby they perceive their response to be more socially acceptable or what they think the

interviewer wants to hear. Privacy cannot be assured because the respondent may be speaking to the interviewer while there are other individuals around that can overhear the conversation, which can also result in inaccurate reporting. The last major limitation of the study is the way the ACE questions were presented. These questions about childhood trauma were ask about in broad categories which has been found to be less reliable than trauma questions that are highly specific (Bailey and Daugherty 2007; Griffin and Amodeo 2010). Some of these questions may be multifaceted leading respondents to be uncertain about how they should answer. The questions are non-specific, which allows for more room for respondent interpretation, instead of the meaning of the question being clear upfront. These limitations make this study well suited to be used as a trial run of the survey questionnaire, and can provide future studies and researchers with advice to help ensure that their research goes smoothly.

The limitations discussed above can provide some recommendations for future research. The easiest improvement that could be made would be to increase the sample size. An increased sample size would also increase the data collection period, but cost of this would be outweighed by the increases in reliability and validity of data collected. Using paper or web-based methodologies could reduce concerns regarding privacy and interviewer effects. Paper and web surveys do not require an interviewer have a much smaller risk of respondents answering in a socially desirable way or feeling inclined to answer a specific way because of the presence of an interviewer. Privacy would also be less of an issue because respondents could take the survey when and where they feel most comfortable and not have the concern of someone else overhearing their conversation. The presentation of the ACE questions could also be improved. More adequate measures of trauma could be obtained by asking more specific questions. The questions could be improved by asking more specific questions about the incidences themselves,

the number and age of the perpetrators, the relationship that the perpetrator has to the victim, the age of the respondent at the time of the incidence, the frequencies of such incidences, and the degree of harm inflicted (Griffin and Amodeo 2010). Another improvement might be to include a comparison group in the study. There is no way to know if the results found here are specific to region of Appalachia or if they are the trend across the United States. By giving the survey to women in several regions of the United States, it would be possible to see just how pertinent these issues are in Appalachia. By including these recommendations, future research will be better suited to examine the role that childhood maltreatment plays in women's decision making surrounding their reproductive health.

CHAPTER 6

CONCLUSION

With nearly 25% of children being victims or witnesses to trauma in the home, such incidences have consequences for the victims or witnesses well into adulthood (NCIPC 2017). How these events affect reproductive health outcomes among Appalachian females remains a concern. This study suggests that childhood traumas may contribute to poorer long-term reproductive health outcomes. To better examine the efficacy of the regression models presented, it would be relevant to collect the data again via a paper or web questionnaire with a larger sample size and rerun the regressions, and then compare the resulting statistics with those presented here. Childhood traumas are known to cause long-term health concerns for victims and witnesses, making it essential to examine all potential negative outcomes. By determining what types of childhood trauma pose the most significant risk for long-term health outcomes, interventions that better address these issues could be implemented in hopes of countering the effects of trauma and increasing reproductive justice for women in Appalachia.

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APPENDICES

Appendix A: Tables

Table 1: Descriptive Statistics

Variable	Description	Mean or Percentage	Standard Deviation
Have you ever visited a health care facility or other place to get sexual and reproductive health services in the last year?	0 = Yes 1 = No	22.5%	---
If you saw a doctor or other health care professional in the last 12 months, did you speak to that person about your sexual behavior?	0 = No 1 = Yes	15.3%	---
Who usually makes decisions about your reproductive healthcare?	0 = You Alone 1 = Someone Else	79.5%	---
Who usually decides when are how you have sex?	0 = You Alone 1 = Someone Else	38.9%	---
In your relationship, who usually makes decisions about birth control?	0 = You Alone 1 = Someone Else	73.3%	---
Are you currently using birth control?	0 = Yes 1=No	15.3%	---
Home Issues Scale	Min. = 0 to Max. = 6	3.6080	1.01482
Physical Abuse Indicator	Min. = 0 to Max. = 1	.0254	.15763
Verbal Abuse Indicator	Min = 0 to Max. = 1	.0561	.23051
Sexual Abuse Scale	Min. = 0 to Max. = 6	.5939	1.52087
Marital Status	0 = Married	88.9%	---
Race or Ethnicity	0 = White	88.1%	---
Highest Level of Education Completed	1 = Did not complete high school, no GED to 10 = Doctoral degree (Ph.D., Ed.D., D.S.W.)	5.43	2.184
Religion	0 = Christian	93.6%	---
Income	1 = Less than $15,000 to 7 = Greater than $100,000	3.172	2.21
Political Affiliation	1 = Very Conservative to 5 = Very Liberal	2.85	1.178

Table 2: Independent Samples T-Tests for Dependent Variables across the Independent Variables

		Home Issues Scale	Verbal Abuse Indicator	Physical Abuse Indicator	Sexual Abuse Scale
Have you ever visited a health care facility or other place to get sexual and reproductive health services in the last year?	No	3.6505	.0462	.0146*	.6295
	Yes	3.4824	.082	.0658*	.4941
If you saw a doctor or other health care professional in the last 12 months, did you speak to that person about your sexual behaviors?	No	3.4068**	.0769	.0444	.6949
	Yes	3.6448**	.0534	.023	.5636
Who usually makes decisions about your reproductive healthcare?	You Alone	3.5968	.0684	.0321	.6431
	Someone Else	3.6538	.0154	.0000	.4231
Who usually decides when and how you have sex?	You Alone	3.6779	.0455	.0382	.6138
	Someone Else	3.5574	.0611	.0144	.5983
In your relationship, who usually makes decisions about birth control?	You Alone	3.6101	.064	.0283	.6852**
	Someone Else	3.57	.0247	.0115	.3529**
Are you currently using birth control?	No	3.6557*	.0256	.037	.5574
	Yes	3.3387*	.0575	.0236	.6061

* $p < .05$
**$p < .1$

Table 3: Binary Logistic Regression Predicting the Effects of Childhood Trauma on if a Woman Visits a Facility for Reproductive Healthcare

Independent Variable	B	Wald	Sig.	Exp(B)	95% C.I. for Exp(B) Lower	95% C.I. for Exp(B) Upper
Home Issues Scale	.066	.266	.606	1.069	.831	1.375
Verbal Abuse Indicator	-.336	1.126	.289	.714	.384	1.329
Physical Abuse Indicator	-.177	.199	.655	.837	.384	1.826
Sexual Abuse Scale	.111	1.364	.243	1.118	.927	1.348
Religious Affiliation	.848	2.193	.139	2.334	.760	7.167
Race or Ethnic Identity	-.321	.707	.401	.726	.344	1.533
Marital Status	-.020	.005	.942	.980	.568	1.692
Highest Level of Education Completed	.010	.024	.877	1.010	.894	1.140
Political Affiliation	.093	1.472	.225	1.098	.944	1.277
Income	.009	.018	.894	1.009	.889	1.144
Constant	.001	.000	.999	1.001		
Model Summary						
	-2 Log Likelihood	**Cox and Snell R Square**	**Nagelkerke R Square**			
	392.446	.021	.032			
* p < .05						N = 383

Table 4: Binary Logistic Regression Predicting the Effects of Childhood Trauma on if a Woman Speaks to a Healthcare Provider about their Sexual Behavior

Independent Variable	B	Wald	Sig.	Exp(B)	95% C.I. for Exp(B) Lower	95% C.I. for Exp(B) Upper
Home Issues Scale	.105	.540	.462	1.111	.840	1.469
Verbal Abuse Indicator	-.247	.456	.499	.781	.381	1.601
Physical Abuse Indicator	-.947	5.318	.021*	.388	.173	.867
Sexual Abuse Scale	.063	.406	.524	1.065	.878	1.292
Religious Affiliation	.259	.135	.714	1.296	.325	5.177
Race or Ethnic Identity	-.008	.000	.985	.992	.409	2.402
Marital Status	-.171	.292	.589	.843	.453	1.567
Highest Level of Education Completed	.034	.228	.633	1.035	.899	1.191
Political Affiliation	-.026	.088	.766	.974	.819	1.158
Income	-.001	.000	.988	.999	.863	1.157
Constant	1.304	1.643	.200	3.683		
Model Summary						
	-2 Log Likelihood	**Cox and Snell R Square**	**Nagelkerke R Square**			
	313.371[a]	.032	.055			N = 383

* p < .05

Table 5: Binary Logistic Regression Predicting the Effects of Childhood Trauma on if a Woman Makes Reproductive Health Decisions Alone or if Someone Else Makes or Jointly Makes the Decision

Independent Variable	B	Wald	Sig.	Exp(B)	95% C.I. for Exp(B) Lower	95% C.I. for Exp(B) Upper
Home Issues Scale	-.096	.405	.525	.909	.677	1.220
Verbal Abuse Indicator	-.584	2.170	.141	.557	.256	1.213
Physical Abuse Indicator	1.263	6.659	.010*	3.535	1.355	9.224
Sexual Abuse Scale	-.139	1.334	.248	.870	.687	1.102
Religious Affiliation	.786	.899	.343	2.194	.433	11.128
Race or Ethnic Identity	-.596	1.014	.314	.551	.173	1.758
Marital Status	-2.087	19.987	.000*	.124	.050	.310
Highest Level of Education Completed	-.077	1.203	.273	.926	.807	1.062
Political Affiliation	-.081	.947	.331	.922	.782	1.086
Income	.168	5.567	.018*	1.183	1.029	1.360
Constant	-1.275	1.300	.254	.279		
Model Summary						
	-2 Log Likelihood	**Cox and Snell R Square**	**Nagelkerke R Square**			
	319.517	.136	.218			

* p < .05

N = 382

Table 6: Binary Logistic Regression Predicting the Effects of Childhood Trauma on if a Woman Makes Decisions about Engaging in Sexual Activities Alone or if Someone Else Makes or Jointly Makes the Decision

Independent Variable	B	Wald	Sig.	Exp(B)	95% C.I. for Exp(B) Lower	95% C.I. for Exp(B) Upper
Home Issues Scale	-.228	3.453	.063**	.796	.626	1.013
Verbal Abuse Indicator	.017	.003	.956	1.017	.561	1.842
Physical Abuse Indicator	-.031	.007	.936	.970	.460	2.045
Sexual Abuse Scale	-.004	.002	.965	.996	.851	1.167
Religious Affiliation	.155	.065	.799	1.167	.356	3.832
Race or Ethnic Identity	-.434	1.480	.224	.648	.322	1.304
Marital Status	-1.410	31.838	.000*	.244	.150	.398
Highest Level of Education Completed	.001	.000	.985	1.001	.895	1.120
Political Affiliation	-.144	4.107	.043*	.866	.754	.995
Income	.110	3.363	.067**	1.116	.992	1.255
Constant	1.838	4.721	.030*	6.283		
Model Summary						
	-2 Log Likelihood	**Cox and Snell R Square**	**Nagelkerke R Square**			
	434.370	.151	.206			

* p < .05
** p < .1

N = 373

Table 7: Binary Logistic Regression Predicting the Effects of Childhood Trauma on if a Woman Makes Decisions about Birth Control Alone or if Someone Else Makes or Jointly Makes the Decision

Independent Variable	B	Wald	Sig.	Exp(B)	95% C.I. for Exp(B) Lower	95% C.I. for Exp(B) Upper
Home Issues Scale	-.133	1.028	.311	.876	.677	1.132
Verbal Abuse Indicator	-.616	3.194	.074**	.540	.275	1.061
Physical Abuse Indicator	1.091	6.618	.010*	2.977	1.297	6.836
Sexual Abuse Scale	-.195	3.242	.072**	.823	.666	1.017
Religious Affiliation	-.570	.886	.347	.565	.172	1.855
Race or Ethnic Identity	-.600	1.682	.195	.549	.221	1.359
Marital Status	-1.188	14.612	.000*	.305	.166	.560
Highest Level of Education Completed	-.109	3.063	.080**	.897	.794	1.013
Political Affiliation	-.084	1.277	.259	.919	.794	1.064
Income	.129	4.050	.044*	1.138	1.003	1.291
Constant	.936	1.118	.290	2.550		
Model Summary						
	-2 Log Likelihood	**Cox and Snell R Square**	**Nagelkerke R Square**			
	386.746	.110	.159			

* p < .05
** p < .1

N = 366

Table 8: Binary Logistic Regression Predicting the Effects of Childhood Trauma on if a Woman Uses Birth Control

Independent Variable	B	Wald	Sig.	Exp(B)	95% C.I. for Exp(B) Lower	95% C.I. for Exp(B) Upper
Home Issues Scale	.189	1.846	.174	1.208	.920	1.587
Verbal Abuse Indicator	-.524	2.228	.136	.592	.298	1.178
Physical Abuse Indicator	.119	.067	.796	1.126	.459	2.762
Sexual Abuse Scale	.05	.228	.633	1.051	.856	1.292
Religious Affiliation	.196	.091	.763	1.217	.339	4.363
Race or Ethnic Identity	-1.108	7.941	.005*	.330	.153	.714
Marital Status	.327	1.010	.315	1.387	.733	2.623
Highest Level of Education Completed	-.047	.434	.510	.954	.829	1.098
Political Affiliation	.077	.764	.382	1.081	.908	1.285
Income	-.016	.045	.831	.985	.853	1.136
Constant	1.108	1.321	.250	3.028		

Model Summary

-2 Log Likelihood	Cox and Snell R Square	Nagelkerke R Square
318.268	.038	.066

* p < .05

N = 385

Appendix B: BRFSS ACE Scale

BRFSS Adverse Childhood Experience (ACE) Module

Retrieved from the CDC 2016

Prologue: I'd like to ask you some questions about events that happened during your childhood. This information will allow us to better understand problems that may occur early in life, and may help others in the future. This is a sensitive topic and some people may feel uncomfortable with these questions. At the end of this section, I will give you a phone number for an organization that can provide information and referral for these issues. Please keep in mind that you can ask me to skip any question you do not want to answer. All questions refer to the time period before you were 18 years of age. Now, looking back before you were 18 years of age---.

1. Did you live with anyone who was depressed, mentally ill, or suicidal?
2. Did you live with anyone who was a problem drinker or alcoholic?
3. Did you live with anyone who used illegal street drugs or who abused prescription medications?
4. Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?
5. Were your parents separated or divorced?
6. How often did your parents or adults in your home ever slap, hit, kick, punch or beat each other up?
7. Before age 18, how often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking. Would you say—
8. How often did a parent or adult in your home ever swear at you, insult you, or put you down?
9. How often did anyone at least 5 years older than you or an adult, ever touch you sexually?
10. How often did anyone at least 5 years older than you or an adult, try to make you touch sexually?
11. How often did anyone at least 5 years older than you or an adult, force you to have sex?

Response Options

Questions 1-4: 1=Yes, 2=No, 7=DK/NS, 9=Refused

Question 5: 1=Yes, 2=No, 7=DK/NS, 8=Parents not married, 9=Refused

Questions 6-11: 1=Never, 2=Once, 3=More than once, 7=DK/NS, 9=Refused

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