Childhood Homelessness as an Adverse Childhood Experience (ACE): Adult Mental Health Outcomes

A Thesis
Submitted to the Faculty
of the Psychology Department

of

Washburn University

In partial fulfilment of
the requirements for

MASTER OF ARTS

Psychology Department

By

Jeff Downes

Topeka, Kansas

April 25, 2024

Thesis Approval
Department of Psychology
Washburn University
Topeka, Kansas

April 2024

I hereby recommend that the thesis prepared under my supervision by

JEFFREY DOWNES

Entitled

CHILDHOOD HOMELESSNESS AS AN ADVERSE CHILDHOOD EXPERIENCE (ACE):

ADULT MENTAL HEALTH OUTCOMES

be accepted in partial fulfillment for the

MASTER OF ARTS DEGREE

Julie Boydston, Ph. D
Chair of the Thesis Committee

John Fritch, Ph. D
Provost and Vice President for Academic Affairs

Cynthia L. Turk, Ph. D
Head of the Department

Recommendation Concurred by

Tucker Jones, Ph. D

Michael McGuire, Ph. D

Committee for the Thesis

Acknowledgements

I would like to acknowledge and extend my sincerest thanks to my committee chair, Dr. Julie Boydston, for her guidance, mentoring, and support. I have greatly appreciated her in encouraging me to pursue and complete this project ahead of time, as well as being the connection between Washburn and our community partners. I also would like to express my gratitude to my committee members, Dr. Tucker Jones and Dr. Michael McGuire, for their feedback and guidance throughout this project. While not a member of this thesis committee, I would also like to thank Dr. Jericho Hockett for her guidance and feedback as I completed this document.

I would also like to acknowledge the support and encouragement of friends, family, and colleagues as I completed this project. Your encouragement was essential in completing this project, and I found talking about my thesis with friends, family, and colleagues helped me to consider additional perspectives and solutions when encountering stuck points.

Finally, I would like to acknowledge our community partners at Topeka Rescue Mission (TRM), not only for providing the statistical data necessary for this project, but also for being completely involved in this project and all other projects stemming from it. Their support and enthusiasm for this project are a testament to the importance and value of collaboration with community partners and conducting community-based research.

Standpoint Statement

Attending high school in downtown Oklahoma City and my undergraduate studies in downtown Omaha helped to formulate my understanding and interest in unhoused populations, as both institutions were near areas where interactions with this population were common. Because I grew up in a middle-class family in a suburban part of Oklahoma City. I do not have any personal experience with being unhoused, therefore, I do have the potential for biases in how I perceive people experiencing homelessness. To mitigate risks for biases, considering my most personal interaction with unhoused populations, which came in the form of an unhoused man who went door to door in our neighborhood asking to do painting jobs, would be beneficial.

The man became unhoused due to the financial burdens of paying for his wife's cancer treatments after she had died, as well as the additional cost of raising his grandchildren after his son lost custody of the children due to struggles with schizophrenia. The numerous interactions my family had with him when hiring him for different paint jobs or inviting him to our house for casual conversation influenced my attempts to conceptualize homelessness as it affects the individual rather than as an abstract concept. Further, his story of how he became unhoused affected my perception of those experiencing homelessness, considering external factors that can and do contribute to experiences of homelessness rather than blaming moral or motivational factors. This individualized conceptualization of homelessness is a part of why I decided to join the project with the Topeka Rescue Mission (TRM), as they have a similar goal to look at those experiencing homelessness on an individual, personal level rather than as a theoretical concept.

Abstract

Adverse childhood experiences (ACEs) are experiences of abuse, neglect, and other household problems occurring before age 18 and contribute to the development of both physical and mental health concerns. People experiencing homelessness report disproportionately higher rates of ACEs and negative mental health concerns; however, little research has been conducted regarding the relationship between ACEs and mental health outcomes specifically for homeless populations. A dearth of research also exists regarding how childhood experiences of homelessness interact with ACEs and mental health outcomes. The present study examined the mental health outcomes for people experiencing homelessness, as well as how childhood experiences of homelessness may fit into the ACEs model using archival data. People experiencing homelessness (n = 100) completed the ACEs questionnaire, a demographics questionnaire, and a health appraisal questionnaire. Results found ACEs significantly predicted negative mental health outcomes for people experiencing homelessness. Childhood experiences of homelessness were predictive of negative mental health outcomes; however, this relationship became negligible when acting as a covariate with ACEs. This result suggests perhaps the ACEs framework adequately explains the traumatic events that may occur to a child experiencing homelessness and the subsequent negative mental health outcomes.

Childhood Homelessness as an Adverse Childhood Experience (ACE): Adult Mental Health Outcomes

Homelessness is not only a national issue, with 653,104 individuals experiencing homelessness in 2023, but also a local issue (de Sousa et al., 2023). An estimated 2,636 individuals experienced homelessness in the state of Kansas in 2023, a 10% increase compared to 2022. Of those cases, 28.6% were instances of unsheltered homelessness, meaning that in over one fourth cases of people experiencing homelessness, the individuals were unable to sleep indoors at night, whether through formal or informal assistance. Internalizing symptoms (or symptoms expressed internally such as depression, withdrawal, and anxiety) and externalizing symptoms (or symptoms expressed outwardly such as aggression, impulsivity, and outbursts) have also been observed in individuals with high ACE scores (i.e., 4 or more) of lower socioeconomic status (Barnhart et al., 2022).

The purpose of the present study is to highlight factors that influence homelessness; specifically, how adverse childhood experiences (ACEs; Felitti et al., 1998) impact adult mental health outcomes of depression, anxiety, schizophrenia, bipolar, and other mental health diagnoses, and related symptoms in a population experiencing homelessness. The study also explores how childhood experiences of homelessness may or may not factor into these mental health outcomes as a childhood traumatic experience. The present study adds to the existing literature by addressing the experience of ACEs in populations experiencing homelessness. In addition, previous research has established negative mental health outcomes for people experiencing homelessness, including depressive, anxious, psychotic, traumatic, and substance use disorders (Davies & Allen, 2017; Giano et al., 2020). Further, investigating instances of childhood experiences of homelessness may help explain future mental health outcomes, as well

as predict future experiences of homelessness. The study also fills in gaps within the face validity of the ACEs questionnaire (McLennan et al., 2020). As other researchers have pointed out, multiple childhood traumatic experiences may not be addressed by the ACEs questionnaire (Bernard et al., 2021). The present study addresses part of this limitation by exploring the potential for inclusion of childhood experiences of homelessness as a scorable ACE.

Traumatic Experiences

Central to the present study is the underlying concept of trauma. Trauma occurs when an individual has an experience of actual or threatened death, serious injury, or sexual violence (APA, 2022). Traumatic events are often unexpected and have long-lasting effects on an individual's physical and mental health functioning and well-being (SAMHSA, 2014). They may take the form of a single experienced event or a more chronic, continuous experience. Traumatic experiences are more common in the United States than people would expect, with approximately 61% of men and 51% of women reporting experiencing at least one traumatic event in their lifetime. Traumatic experiences commonly occur during childhood, with more than two thirds of children reporting experiencing at least one traumatic event before the age of 16 (Copeland et al., 2007).

Adverse Childhood Experiences

One way in which childhood experiences with trauma are conceptualized is through the ACEs framework, originally developed by Felitti et al. (1998) in conjunction with Kaiser-Permanente and the Center for Disease Control (CDC). ACEs are considered potentially traumatic events in childhood (CDC, 2021); however, this definition is somewhat subjective, as traumatic events can encompass multiple potential events (Portwood et al, 2023). Because of this subjectivity, using the original ACEs framework (Felitti et al., 1998) is a generally accepted

practice when operationalizing ACEs (Portwood et al., 2023). ACEs, per Felitti et al. (1998), are experiences of abuse, neglect, and other household challenges prior to age 18. The original ACEs framework identified 10 specific traumatic experiences: emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, parental separation, or divorce, witnessing domestic violence, living with a person struggling with alcohol or substance misuse, living with someone with a mental disorder, and experiencing a household member being incarcerated.

Abuse in the ACEs framework includes physical abuse, or the intentional use of physical force that can result in injury; sexual abuse, such as pressuring or forcing a child to engage in sexual acts; and emotional abuse, or behaviors that cause harm to a child's emotional well-being (SAMHSA, 2014). Felliti et al. (1998) operationalized emotional abuse as a parent or other adult in the household often swearing at, insulting, putting down, humiliating, or acting in a way that made the child afraid of physical harm. Physical abuse involves a parent often pushing, grabbing, slapping, or throwing something at the child, or ever hitting the child hard enough to leave marks or injure them. Sexual abuse in the ACEs framework involves an adult or person at least five years older than the child touching, fondling, or touching the child's body in a sexual way, or attempting or actually having oral, anal, or vaginal intercourse.

Neglect in the ACEs framework refers to failure to meet a child's basic needs, including physical and emotional needs (SAMHSA, 2014). Emotional neglect involves the child often feeling that no one in their family loved them or considered them important or special, or that they felt their family did not care for, feel close to, or support each other (Felliti et al., 1998). Physical neglect is focused more on the child feeling as though they were not provided necessities such as food, clean clothes, and protection, or that parents were under the influence of

alcohol or drugs and were unable to take care of the child or take them to the doctor when necessary.

Household challenges are other potentially traumatic or negative events that occur in childhood (Felliti et al., 1998). These other potentially problematic situations include the incarceration of a relative, separation/divorce of parents, witnessing domestic violence (i.e., a parent or adult caregiver was often pushed, grabbed, slapped, had things thrown at them, kicked, bitten, punched, hit with something hard, repeatedly hit over at least a few minutes, or threatened with a weapon), living with anyone struggling with substance misuse, and familial mental illness/suicide attempt as the domains of household challenges. The original Kaiser-Permanente and CDC study found that about two-thirds of the sample (n = 17,337) had experienced at least one ACE, with 12.5% experiencing 4 or more ACEs. Four ACES is the threshold for a high increase in negative physical and mental health outcomes (Felliti et al., 1998).

ACEs and Mental Health Outcomes

Strong evidence exists suggesting accumulation of ACEs predicts both current and future health-risk activities (e.g., substance misuse), mental and physical health disorders, and mortality (Karatekin et el., 2023). Higher exposure to ACEs has been correlated with multiple negative mental and physical health outcomes, such as an intense and extended stress response (Madigan et al., 2023). The increase in intensity and length of the stress response is related to an increase in negative outcomes for neurological, cognitive, and socioemotional development in children and adolescents. People who have been exposed to ACEs are more likely to engage in behaviors detrimental to their health, particularly substance misuse behaviors. ACEs are also correlated with an increase in mental health diagnoses and symptoms, including experiences of depression and anxiety disorders, as well as PTSD, and suicidality (Felitti et al., 1998). Evidence also

suggests around one-third of mental health and behavioral issues may be attributed to ACEs (Green et al., 2010; Kessler et al., 2010; McLaughlin et al., 2012; Portwood et al., 2023).

There is also evidence to suggest mental health outcomes are not the same for each individual ACE or the three ACE categories (Negriff, 2020). For example, Negriff (2020) found those who endorsed witnessing domestic abuse reported more symptoms of depression, anxiety, and trauma compared to other household challenges items. Sexual and physical abuse were associated with elevated levels of depression, trauma, and externalizing symptoms, while physical abuse was associated with higher rates of depression, anxiety, and trauma. Emotional abuse and neglect were associated with depression, trauma, anxiety, and externalizing symptoms. Negriff (2020) also found items of maltreatment (i.e., abuse and neglect) significantly accounted for most of these mental health outcomes.

Experiences of Homelessness with ACEs and Mental Health

Outside of the ACEs framework, experiences of homelessness are related to significant negative mental health outcomes, including higher prevalence rates of schizophrenia, depression, bipolar disorder, personality disorders, posttraumatic stress disorder (PTSD), and substance use disorders (Giano et al., 2020; Tsai et al., 2011). People experiencing homelessness also tend to have higher instances of ACEs. While ACE prevalence is high in the general population, this trend is exacerbated for those experiencing homelessness, as adults who experienced homelessness in childhood are more likely to report experiencing four or more ACEs (68.1%) compared to those who did not (16.3%) (Radcliff et. al., 2019). Similarly, Radcliff et al. (2019) found higher self-reports of each individual ACE item in those who experienced childhood homelessness compared to those who did not. Further evidence suggests childhood adversity, including ACEs, is predictive of experiencing homelessness as an adult (Cutuli et al., 2017).

High ACE scores can influence a variety of negative mental health outcomes in the general population. For example, a study of intergenerational maltreatment was conducted focusing on families in emergency shelter units (Narayan et. al., 2017). Narayan et al. collected ACE scores of mothers and children and video data of parent-child interactions focusing on negative parenting practices (i.e., harsh, hostile, inconsistent, or coercive parenting practices). The study of intergenerational maltreatment also collected teacher reports of each child's socioemotional deficits as observed in a classroom setting. The study found higher parental ACE scores to be significantly correlated with higher child ACE scores. Narayan et al. also found that childhood exposure to maltreatment was significantly correlated with socioemotional deficits; however, the same trend was not found for exposure to family dysfunction.

Although a dearth of literature exists regarding mental health outcomes for people experiencing homelessness as they relate to ACE scores, ACEs have been associated with suicidality, depression, substance use, and victimization (i.e., experiencing violence directed at oneself). Looking at socioeconomic status more broadly, Barnhart et al. (2022) investigated family socioeconomic status (SES), ACEs, and internalizing and externalizing symptoms and behaviors. The study found lower family SES was a significant predictor of higher rates of externalizing symptoms for both youth and caregiver ratings. ACEs were found to indirectly account for higher levels of both internalizing and externalizing symptoms.

While investigating current experiences of homelessness is important, childhood experiences of homelessness should also be considered to work towards more preventative solutions earlier in the lifespan, as well as mitigate the risk for negative mental and physical health outcomes. Chamberlain and Johnson (2013) found that of the five common pathways to experiencing homelessness (i.e., housing crisis, family breakdown, substance use, mental health

issues, and youth to adult homelessness), the youth to adult pathway was the most reported, with 35% of their sample population falling into this pathway. The young people who were part of the youth to adult pathway were often part of a state care system and were exposed to ACEs such as sexual and physical abuse, parental drug abuse, and parental violence. The experience of homelessness during childhood could also be considered an ACE itself due to the instability of needs being met and the potential for real or threatened harm. Childhood experiences of homelessness and their relationship to ACEs are explicitly explored in the present study.

Theoretical Orientation

Because ACEs as they relate to populations experiencing homelessness is an emerging area of research, few theories exist geared specifically toward this demographic. However, looking at ACEs overall, the general mechanistic theory of how ACEs influence negative outcomes is the ACE pyramid (Felitti, 1998; see Appendix A). The ACE pyramid theory posits that ACEs can lead to negative outcomes in both physical and mental health, mediated through both social conditions and historical trauma. With these conditions, ACES can lead to disrupted neurodevelopment including reduced amygdala, medial prefrontal cortex, and hippocampal volume, as well as increased amygdala sensitivity to threat (McLaughlin et al., 2019). This disrupted neurodevelopment, in turn, leads to impairments in social and emotional skills as well as cognition, influencing an increase in health risk behavior. These negative outcomes significantly contribute to the development of disease, disability, and social problems, which can lead to early death (Merrick et al., 2019; Yu et al., 2022). These same negative outcomes have been reported for people experiencing homelessness more generally (Aubry et al., 2015; Fazel et al., 2014; Heerde et al., 2023; Spector et al., 2020)

While the ACE pyramid is the prevailing theory regarding development of ACEs, other theories exist to explain aspects not accounted for by the ACEs pyramid. For example, Bernard et al. (2021) questioned how well the ACEs framework applies to Black youth, proposing an extension of the ACEs framework to consider the unique traumatic events Black children are at high risk of experiencing (culturally informed Adverse Childhood Experiences, or C-ACEs). This framework extends the original ACEs framework (Felitti, 1998) to include experiences of racism as both a unique ACE category (which is not included in the original questionnaire) as well as an influence on Black mental and physical health. Particularly, C-ACEs acknowledges the shortcomings of the ACEs framework by considering individuals who may not endorse ACE categories from the original questionnaire but have similar negative outcomes due to experiences of racism in childhood. This model also gives credence to the research question of looking at homelessness as an ACE item (i.e., childhood experiences of homelessness) and what impact that has on current mental health outcomes, as people experiencing homelessness are a marginalized group themselves.

Hypotheses

The study seeks to extend the current literature by considering two hypotheses. The first hypothesis (H1) is focused more broadly on mental health outcomes for people experiencing homelessness. More specifically, H1 predicts instances of negative mental health outcomes for people experiencing homelessness will increase as a function of ACE scores, consistent with previous literature on ACEs. The second hypothesis (H2) expects, when controlling for their ACE score, people who experienced homelessness in childhood will have worse mental health outcomes than those who did not experience homelessness during childhood.

Method

Participants

The present study used archival data collected by a local, nonprofit shelter and mobile hygiene access unit in the Midwest region of the United States. The organization surveyed 100 people experiencing both sheltered and unsheltered homelessness receiving both shelter and hygiene access services. Participants were recruited to the study on a voluntary basis when receiving either service by the non-profit organization. Participants' ages range from 18 to 60+ years old. The sample had more male (60%) participants than female, while the ages of participants tended to vary little. See *Table 1*. The race/ethnicity of participants was primarily white participants (64.2%) with 20% identifying as Black or African American. This percentage is nearly double the 2023 population estimate for Black and African Americans living in Topeka, which is 10.2% according to the US Census Bureau (n.d.), meaning Black and African Americans were largely overrepresented in the sample. This finding is consistent with previous literature and current statistics, which indicate Black and African American individuals have been overrepresented in the homeless population since at least the 1980s due to inequity and discrimination and are currently overrepresented at 37.3% of the US population (Moser Jones, 2016; de Sousa et al., 2023).

Materials

Adverse Childhood Experiences (ACEs) Questionnaire

The ACEs Questionnaire (Felitti et al., 1998) is a 10-item measure of experiences of abuse and household dysfunction experienced prior to age 18 (see Appendix B). The questionnaire proposes yes or no questions regarding experiences with the 10 ACEs in childhood. The items included on the measure are meant to encompass a wide range of potential childhood traumatic events relating to both firsthand experiences of events as well as witnessing

traumatic or adverse events occurring to close family members. For example, Item 2 asks the question, “Did a parent or other adult in the household **often** push, grab, slap, or throw something at you? Or **ever** hit you so hard that you had marks or were injured?” with [Yes] and [No] being the response options. Each item endorsed is added together to produce a total ACE score on a scale from zero to ten, with zero indicating no ACEs experienced prior to age 18 and ten indicating all ACEs were experienced before age 18.

Despite the ACEs questionnaire being rapidly adopted by mental and physical health practitioners, community-aid organizations, and other areas where trauma-informed care is necessary, a scarcity of research exists on the psychometric properties of the measure. From what is available, however, the questionnaire demonstrates low internal consistency ($\alpha = .64$) (Kovács-Tóth et al., 2023). The questionnaire also demonstrates low to moderate internal validity for each item when correlating total ACE score with each individual ACE item, with the lowest item being incarceration of a family member and the highest being emotional abuse ($r = .28$, $p < .001$; $r = .70$, $p < .001$). However, the study from which these psychometric properties were found was conducted in a population of Hungarian adolescents, and therefore may not generalize to a population of adults experiencing homelessness in the Midwest United States. A study conducted in a US population found moderately high test-retest reliability for the ACEs measure ($r = .71$, $p < .001$), though the study was conducted exclusively on NCAA Division I athletes (Zanotti et al., 2018). Further research is necessary to determine the internal validity and consistency for populations experiencing homelessness in the United States. Although these limitations should be addressed in future research, the ACEs questionnaire still reliably predicts negative physical and mental health outcomes as previously mentioned (Portwood et al., 2023).

ACEs, Demographics, and Health Appraisal Survey

All participants completed a survey (Appendix C) including all questions from the Kaiser-Permanente/CDC ACEs questionnaire (Felitti et al., 1998) as discussed in the previous section. This survey also asked about demographic information, including age, race, and gender. Additionally, this survey asked about other potentially relevant information such as if the participants experienced homelessness in childhood, educational attainment, if they have experienced or are currently experiencing chronic (lasting up to 1 or more years) or episodic (multiple instances) homelessness, and if the participant was in foster care. Finally, the survey concluded by asking the participant about any physical and/or mental health diagnoses received.

Childhood Homelessness

The concept of childhood experiences of homelessness was a variable of interest for the present study. Childhood experiences of homelessness was measured via a categorical question in the demographics section of the survey, which asked "did you ever experience homelessness as a child (0-18)?" Two possible response options were posed for this question, which were "yes" or "no." The "no" response was coded as 0 in the dataset, while "yes" was coded as 1 to be consistent with the items on the ACEs questionnaire.

Mental Health Outcomes

The health appraisal portion of the survey contained 11 questions regarding specific mental health diagnoses. Seven questions asked about specific mental health-related symptoms. Participants were asked "are you troubled with troubled with: crying spells; depression or 'feel down a lot;' much trouble with nervousness." Participants were then asked, "do you currently or have you ever: sometimes drink more than is good for you; use street drugs." Finally, they were asked "have you ever; had suicidal ideation; think of hurting yourself often. The final five questions asked participants about specific mental health diagnoses. "Are you often troubled

with or been diagnosed with any of the following mental illnesses? Depression? Anxiety? Schizophrenia? Bipolar disorder? Other mood disorder?" All questions contained response options of "no" or "yes" and were coded as 0 and 1 respectively in the dataset. The responses were then summed to give a total score for mental health symptoms and diagnoses, with possible scores ranging from 0 (meaning no mental health symptoms or diagnoses were endorsed) to 11 (meaning all mental health symptoms and diagnoses were endorsed).

Design and Procedure

As previously stated, the present study utilized archival data collected by the shelter organization to establish correlational connections between the variables. The archival data was collected by the shelter who administered the survey to 100 participants upon entry to their shelter location or those utilizing their mobile shower units. The survey data was collected anonymously and voluntarily. Survey administrators introduced the survey to participants by stating that it is a voluntary, self-reported, and anonymous survey that asks questions about ACEs they may have encountered before the age of 18. They were also made aware that additional sections of the survey would ask about specific demographics of age, race, gender, and history of homelessness, as well as any mental and physical health problems experienced or currently being experienced in adulthood. Participants were then notified that they were allowed to discontinue the survey at any time if they felt uncomfortable answering the questions presented. Before proceeding with the survey, participants were asked if they felt comfortable to go through the survey process. Once consent was given, participants completed the survey. The last four digits of the participants' social security numbers were used as participant IDs to ensure the same participant did not complete the survey more than once. After completing the survey, each participant was compensated with a piece of candy and a single-use bus pass.

The procedure for the current project began after the master's committee approved the project. The researcher received written consent from the shelter organization to utilize the archival data, which included the stipulations and boundaries of use, and the project was approved by the Washburn University IRB. After the researcher gained approval, the shelter organization provided the raw, anonymous, and deidentified statistical data for analysis, with any duplicate participants deleted and the last four digits of social security numbers removed. This data was then transferred to a secure drive at the Washburn University Department of Psychology to keep controlled access over the data. The data was transferred to Microsoft Excel to correct any instances of incorrectly formatted data, duplicate data, or missing data before being transferred to IBM SPSS for statistical analyses to test the hypotheses.

Results

Univariate Analyses

Univariate analyses of frequency were conducted on each variable of interest to account for possible outliers before attempting to test each hypothesis. The preliminary analysis showed 19.2% of participants experienced homelessness during childhood. This finding is much higher than the US population of children experiencing homelessness, which is estimated to be less than a percent (de Sousa et al., 2023). This is consistent with literature on childhood homelessness and episodic homelessness, which finds childhood homelessness is negatively associated with housing stability in adulthood (Parpouchi et al., 2021). A frequency analysis was also conducted to determine the frequency at which each ACE score occurred. The average ACE score among participants was in the high range (i.e., 4 or more ACEs), with the modal score being 6 (M = 4.82, SD = 2.96). No major outliers were present in the distribution of this variable. See *Figure 1*. The frequency of total mental health symptoms and diagnoses endorsed by each participant

varied but tended to fall around the middle range (i.e., endorsing around five out of the eleven possible symptoms and diagnoses; $M = 5.66$, $SD = 3.09$).

Univariate analyses of frequency were also utilized to determine the most frequently occurring ACEs in the sample. The most frequently endorsed ACE was living with someone with substance use issues (71%), followed by parental divorce/separation (69%), verbal abuse (61%), emotional neglect (51%), and living with someone with mental health issues (51%). Less than half of the sample endorsed physical abuse (43%), physical neglect (41%), sexual abuse (39%), and witnessing domestic abuse (31%). The least-endorsed ACE was having an incarcerated member of the household (25%). See *Figure 2*.

Univariate analyses of frequency were used to assess the most frequently occurring mental health concerns as well. The most endorsed mental health diagnosis was depression (76.3%), followed by anxiety (67.0%), bipolar disorder (46.7%), and schizophrenia (21.7%). The number of individuals who endorsed having another mood disorder was 38.7%. See *Figure 3.* The most endorsed mental health symptom was feeling depressed or down a lot (74.2%), followed by using street drugs (52.1%), nervousness (49.5%), suicidal ideation (44.3%), binge drinking (40.2%), crying spells (39.2%), and thinking of hurting themselves often (21.6%). See *Figure 4.* Of note, binge drinking and using street drugs may be underreported, as mentioned previously, due to the shelter organization's stipulations for staying at the shelter including not using drugs or alcohol (though it was made clear this survey was anonymous and would not affect their ability to stay at the shelter). Therefore, these items were not included in the total mental health symptoms and diagnoses score.

Hypothesis 1

Hypothesis 1 stated that ACE scores would be significantly associated with negative mental health outcomes. The total number of endorsed mental health symptoms and diagnoses were used as the dependent variable, while participants' standardized scores on the ACE Questionnaire were used as the independent variable. The linear regression analysis indicated negative mental health outcomes did increase as ACE scores increased, $R^2 = .252$, $F(95) = 32.01$, $p < .001$. See *Figure 5.*

Multiple follow up independent samples *t*-tests were run to determine which individual ACEs were most associated with negative mental health outcomes. See *Table* 2 for means and standard deviations. Results found that all ACEs except for divorce/separation of parents ($t(95) = -1.34$, $p = .092$, $d = .295$) were significantly correlated with negative mental health outcomes. The ACE most associated with negative mental health outcomes was living with someone with substance use issues, $t(95) = -4.197$, $p < .001$, $d = .940$, followed closely by witnessing physical domestic abuse, $t(95) = -4.20$, $p < .001$, $d = .828$. Sexual abuse was the ACE third most associated with negative mental health outcomes, $t(95) = -3.97$, $p < .001$, $d = .772$. The next most associated ACEs were emotional neglect, $t(95) = -3.52$, $p < .001$, $d = .721$, living with someone with mental health issues, $t(95) = -3.52$, $p < .001$, $d = .715$, physical abuse, $t(95) = -3.35$, $p < .001$, $d = .689$, verbal abuse, $t(95) = -3.33$, $p < .001$, $d = .692$, a member of the household being incarcerated, $t(95) = -2.34$, $p = .011$, $d = .544$, and physical neglect, $t(95) = -2.73$, $p = .004$, $d = .532$, respectively. However, homogeneity of variance was violated for sexual abuse, emotional neglect, physical neglect, and witnessing domestic physical abuse, meaning the results for these categories should be considered with caution.

A univariate analysis of variance (ANOVA) revealed that race/ethnicity were not significant correlated with ACE scores, $F(4, 90) = 2.29$, $p = .066$, $R^2 = .092$. Race/ethnicity were

also not significantly correlated with negative mental health outcomes, $F(4, 87) = .969$, $p = .429$, $R^2 = .043$. An independent samples *t*-test found gender was also not significantly associated with ACE scores, $t(95) = 1.47$, $p = .072$, $d = .301$. Similarly, gender was also not significantly correlated with negative mental health outcomes, $t(98) = 1.04$, $p = .150$, $d = .215$.

Hypothesis 2

Hypothesis 2 predicted the number of negative mental health outcomes to be higher for those who experienced childhood homelessness compared to those who did not when controlled for ACE scores. A univariate analysis of covariance (ANCOVA) demonstrated that childhood experiences of homelessness was not associated with mental health outcomes in a meaningful way when controlled for ACE score, $F(1, 93) = .007$, $p = .934$, $\eta_p^2 = .000$.

An exploratory independent samples *t*-test was conducted as well to determine if childhood experiences of homelessness influenced mental health outcomes without factoring in ACE scores. The results found those who experienced homelessness in childhood had significantly more negative mental health outcomes ($M = 6.79$, $SD = 3.01$) compared to those who did not ($M = 5.42$, $SD = 3.08$), $t(94) = -1.75$, $p = .042$ $d = .449$. If total ACE scores are taken out, childhood homelessness is predictive of negative mental health outcomes; however, when ACE scores are a covariate, childhood homelessness is not meaningfully related to mental health outcomes, with ACE scores being still significantly predicting negative mental health outcomes.

Exploratory phi correlations were used to determine how closely associated each individual ACE was with instances of childhood homelessness. Witnessing physical domestic abuse was the most associated with childhood homelessness, $\Phi = .348$, $p < .001$, $r^2 = .174$. Living with someone with substance use issues was the next strongest association, $\Phi = .306$, $p = .002$, $r^2 = .153$, followed by physical abuse, $\Phi = .297$, $p = .003$, $r^2 = .149$, verbal abuse, $\Phi = .288$,

$p = .004$, $r^2 = .144$, living with someone with mental health issues, $\Phi = .277$, $p = .005$, $r^2 = .139$, and physical neglect, $\Phi = .226$, $p < .025$, $r^2 = .113$. All other ACE categories were not significantly associated with childhood homelessness. See *Table 3*.

Discussion

The goal of the present study was to demonstrate how ACEs (Felitti et al., 1998) impact adult mental health outcomes in a population experiencing homelessness and examine how childhood experiences of homelessness may factor into these mental health outcomes as a childhood traumatic experience. Descriptive statistics of the sample demonstrated variability across sex and age groups, though found a disproportionate percentage of Black/African American participants compared to the percentage found in the population of Topeka, Kansas (U.S. Census Bureau, n.d.). This disproportionate outcome might lend additional support, albeit preliminary and observationally, towards Bernard et al.'s (2021) C-ACEs theory arguing for the inclusion of racial trauma and discrimination as ACEs. Future research should explore this disproportionate outcome in the context of the C-ACEs framework.

Results for the first hypothesis found mental health symptoms and diagnoses moderately increased as participants reported higher ACE scores. This result is consistent with findings of previous literature, which have found the connection of ACEs with mental health symptoms in the general population (Felitti et al., 1998; Madigan et al., 2023). These results add to the existing literature by replicating the finding in previous literature of ACEs being associated with mental health outcomes in homeless populations (Giano et al., 2020; Tsai et al., 2011). The moderate regression results, however, leave room for future research to determine what other factors influencing negative mental health outcomes are left unexplained by ACEs for those experiencing homelessness.

Living with someone struggling with substance use issues, parental separation/divorce, and verbal abuse were the three most endorsed ACEs in the sample. Living with someone with substance use issues was also the item with the strongest correlation with negative mental health outcomes of the individual ACEs, while parental separation/divorce had the weakest correlation. These findings would suggest that living with someone with substance use is a major risk factor for children and adolescents for developing mental health disorders and symptoms. Further, while parental divorce and separation can be a negative and traumatic experience for children and adolescents, the item is not significantly associated with these mental health outcomes in a population experiencing homelessness. This result might indicate another potentially traumatic event more closely associated with negative mental health outcomes may be better suited for inclusion in the ACEs questionnaire.

Interestingly, childhood experiences of homelessness did not predict mental health outcomes when accounting for ACE scores, contrary to what was hypothesized. However, childhood experiences of homelessness did predict increased negative mental health outcomes when not accounting for other ACEs, which is consistent with literature regarding low socioeconomic populations (Barnhart et al., 2022). This result would seem to indicate that, although childhood experiences of homelessness do predict worse mental health outcomes, this effect may be accounted for by other ACEs experiences, such as witnessing domestic abuse, living with someone struggling with substance use issues, or sexual abuse as was found in the results from this sample. An explanation for this finding might be that those who experienced childhood homelessness likely would have experienced various other ACEs at that time as well (Radcliff et. al., 2019), which may still account for their mental health diagnoses and symptom

more than the experience of homelessness itself. This finding is a reversal of what was originally hypothesized.

The results have relevant implications for treatment of mental health disorders and symptoms for those experiencing homelessness, particularly regarding the adoption of a trauma-informed care (TIC) framework when working with clients who have or are currently experiencing homelessness (Thordarson & Rector, 2020). Instances of trauma are often not addressed during treatment as usual for those who are not specifically addressing trauma, especially for vulnerable groups such as those experiencing homelessness. TIC provides a shift towards addressing mental health problems as a function of traumatic events rather than a failing of the individual (SAMHSA, 2014). Because ACEs were found to be very prevalent in this sample and were highly predictive of negative mental health outcomes, TIC is likely a therapeutic approach that would offer positive outcomes for those experiencing homelessness (Thordarson & Rector, 2020).

While treatment on an individual level is important, systemic barriers must not be ignored. Results from the present study not only add to the research literature, but also provide evidence that can be used to affect positive change at local, state, and federal policy-levels. Potential policies could help ensure access to resources and address barriers to receiving treatments, as well as fund early interventions to address ACEs. These potential policy changes include implementing the “housing-first” model as addressed by Winiarski et al. (2021) in which individuals are housed before addressing other struggles, and increasing access to more affordable housing, which is associated with reduced instances of psychological and physical abuse (Marçal, 2022). Policy changes such as these are necessary to provide adequate resources

to act as protective factors against the negative outcomes associated with experiencing homelessness and ACEs.

Limitations and Future Directions

There are some limitations in the present study. One limitation was the small sample size. The sample size of 100 did not meet the optimal sample size calculated (n = 336). However, due to the difficulty of surveying multiple unique individuals experiencing homelessness, time constraints, and the archival nature of the study, a larger data set was not possible. Future research should aim to increase the sample size to ensure larger statistical power.

Another limitation of this research was the use of a self-report survey, which has the opportunity for bias and inaccurate recall among participants. In addition, the scope of mental health outcomes assessed were somewhat limited. Only four diagnoses (depression, anxiety, bipolar, and schizophrenia) were explicitly mentioned. While "other" was an option to select, a field did not exist to write these other diagnoses. Therefore, only the four explicitly mentioned diagnoses could be examined. Future research should expand the scope of the mental health outcomes assessed to determine rates of other diagnoses and symptoms (e.g., PTSD, suicidality).

There was also a limitation in question about substance use. The shelter organization who surveyed the participants does not allow individuals who are actively using substances to stay at their shelter. Although participants were made aware that the survey was anonymous, participants likely underreported if they were currently using substances due to this constraint. Therefore, the question on substance use was not incorporated with the mental health outcomes total score. Future research should factor in substance use problems in assessing mental health issues. The ACEs questionnaire also had a limitation of a lack of data regarding chronic trauma occurrence. While the ACEs questionnaire assesses for multiple types of traumatic events, it does

not ask how often these occurred (Karatekin et al., 2023), meaning we do not know if these traumatic events occurred only once or if they were continually experienced throughout childhood. Future research should implement additional questions addressing chronicity to determine if there is a difference in mental health outcomes between one-time trauma exposure and chronic trauma exposure.

Conclusions

Results from the present study provide further evidence regarding ACEs and their ability to predict negative mental health outcomes, as well as evidence that these outcomes are amplified in a population experiencing homelessness. The study also adds to the literature as one of the few studies examining childhood experiences of homelessness, ACEs, and adult mental health. Results suggest that ACEs are associated with negative mental health outcomes in that as ACE scores increase the number of mental health symptoms and diagnoses endorsed also increases. In addition, analyses conducted indicate childhood experiences of homelessness are also predictive of mental health outcomes; however, when factoring in ACE scores this variable becomes negligible.

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Table 1
Frequencies of Demographic Variables

Variable	Frequency
Gender	
Female	40 (40%)
Male	60 (60%)
Race/Ethnicity	
White	61 (64.2%)
Hispanic	3 (3.2%)
Black	19 (20.0%)
Native American	4 (4.2%)
Mixed/Other	8 (8.4%)
Age	
18-29	19 (19.2%)
30-39	26 (26.3%)
40-49	15 (15.2%)
50-59	24 (24.2%)
60+	15 (15.2%)

Table 2
Mean Number of Mental Health Symptoms/Diagnoses Endorsed by ACE Category.

Variable	No	Yes	*p*
	M (SD)	*M (SD)*	
Verbal Abuse	4.42 (3.24)	6.46 (2.74)	< .001
Physical Abuse	4.80 (3.02)	6.83 (2.83)	< .001
Sexual Abuse	4.76 (3.24)	7.00 (2.32)	< .001*
Emotional Neglect	4.57 (3.26)	6.68 (2.57)	< .001*
Physical Neglect	5.02 (3.33)	6.62 (2.44)	.004*
Parental Separation	5.03 (3.33)	5.94 (2.96)	.092
Witness DA	4.89 (3.11)	7.29 (2.36)	< .001*
Household SU	3.75 (3.09)	6.43 (2.76)	< .001
Household MH	4.60 (3.07)	6.69 (2.78)	< .001
Household Inc.	5.24 (3.06)	6.88 (2.91)	.011

Note. DA: Domestic Abuse; SU: Substance Use; MH: Mental Health; Inc.: Incarceration

*Homogeneity of variance was violated for these items, meaning the results for these categories should be considered with caution.

Table 3

Phi Correlations of Individual ACEs with Childhood Experiences of Homelessness.

Variable	*n*	*M*	*SD*	Pearson *Φ*
Verbal Abuse	99	.61	.490	.288**
Phys. Abuse	99	.43	.498	.297**
Sexual Abuse	99	.39	.490	.143
Emotion. Neg	99	.51	.502	.123
Physical Neg.	99	.41	.494	.226*
Parental Sep.	99	.69	.465	.053
Witness DA	99	.31	.465	.348**
House. SU	99	.71	.456	.306**
House. MH	99	.51	.502	.277**
House. Inc.	99	.25	.435	.130
Childhood H.	99	.25	.396	-

**Correlation is significant at the .01 level (2-tailed)

*Correlation is significant at the .05 level (2-tailed)

Note. DA: Domestic Abuse; House. SU: Household member with substance use struggles; House. MH: Household member with mental health struggles; Inc.: Incarceration; Childhood H: Childhood experiences of homelessness.

Figure 1

Distribution of Total ACE Scores.

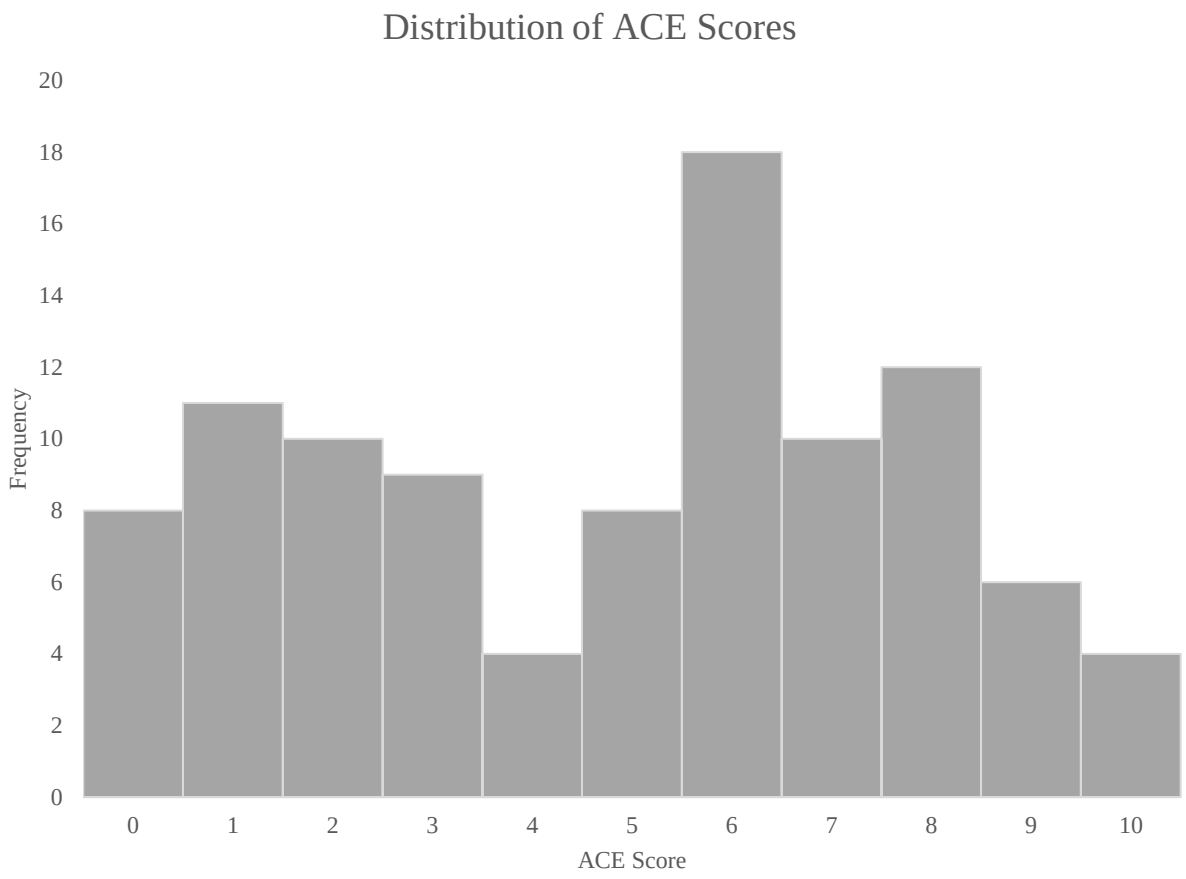
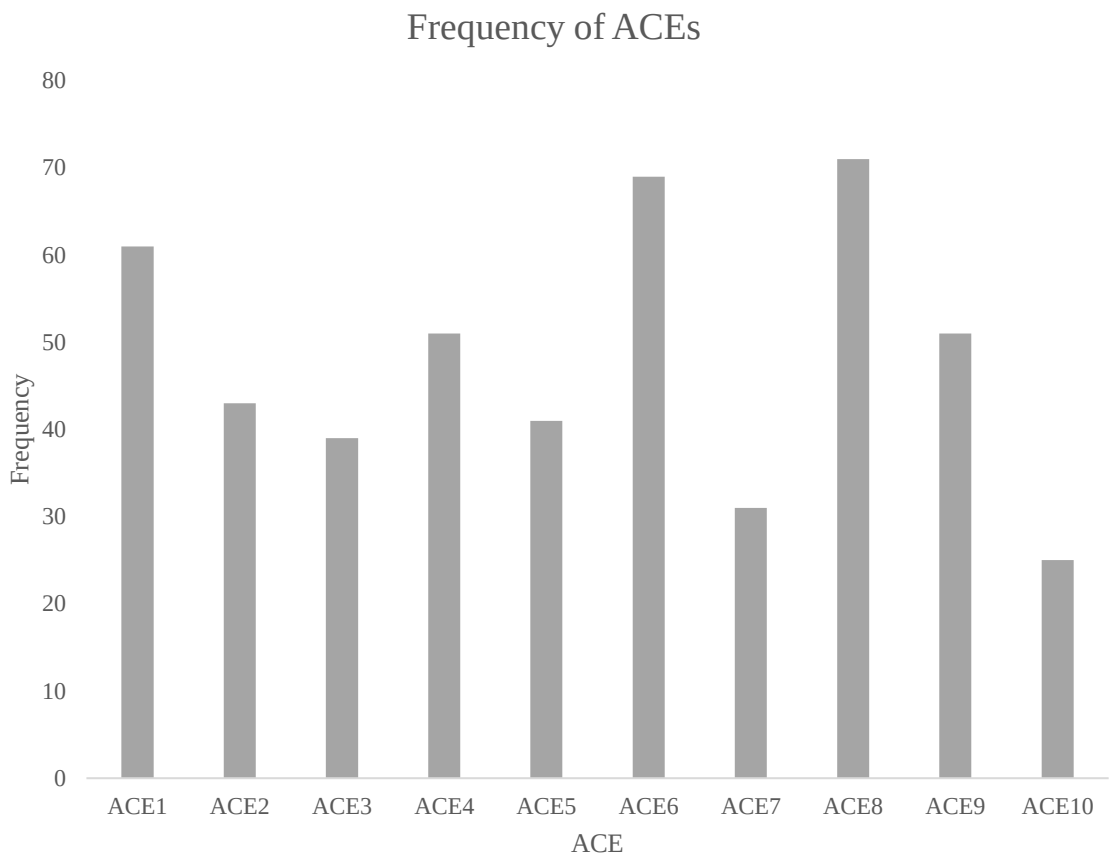


Figure 2
Frequency of Each ACE Item.



Note. For ease of readability, each ACE was numbered, such that ACE1 = Verbal Abuse, ACE2 = Physical Abuse, ACE3 = Sexual Abuse, ACE4 = Emotional Neglect, ACE5 = Physical Neglect, ACE6 = Parental Divorce/Separation, ACE7 = Witnessing Domestic Physical Abuse, ACE8 = Household Member with Substance Use Issues, ACE9 = Household Member with Mental Health Issues, and ACE10 = Household Member Incarcerated

Figure 3

Frequency of Each Mental Health Diagnosis.

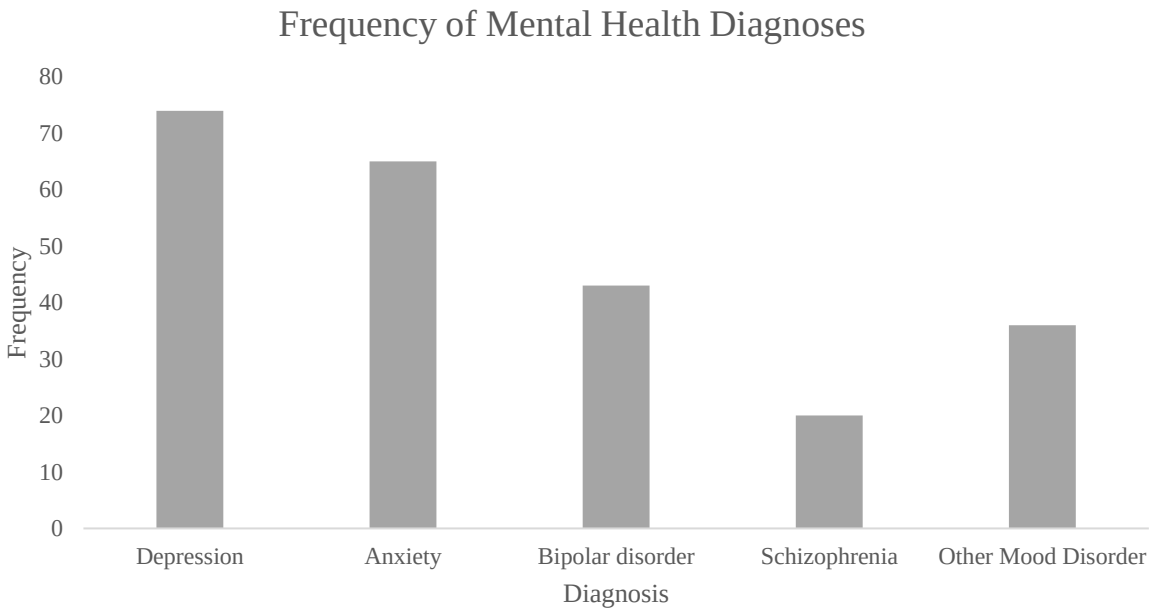


Figure 4

Frequency of Each Mental Health Symptom.

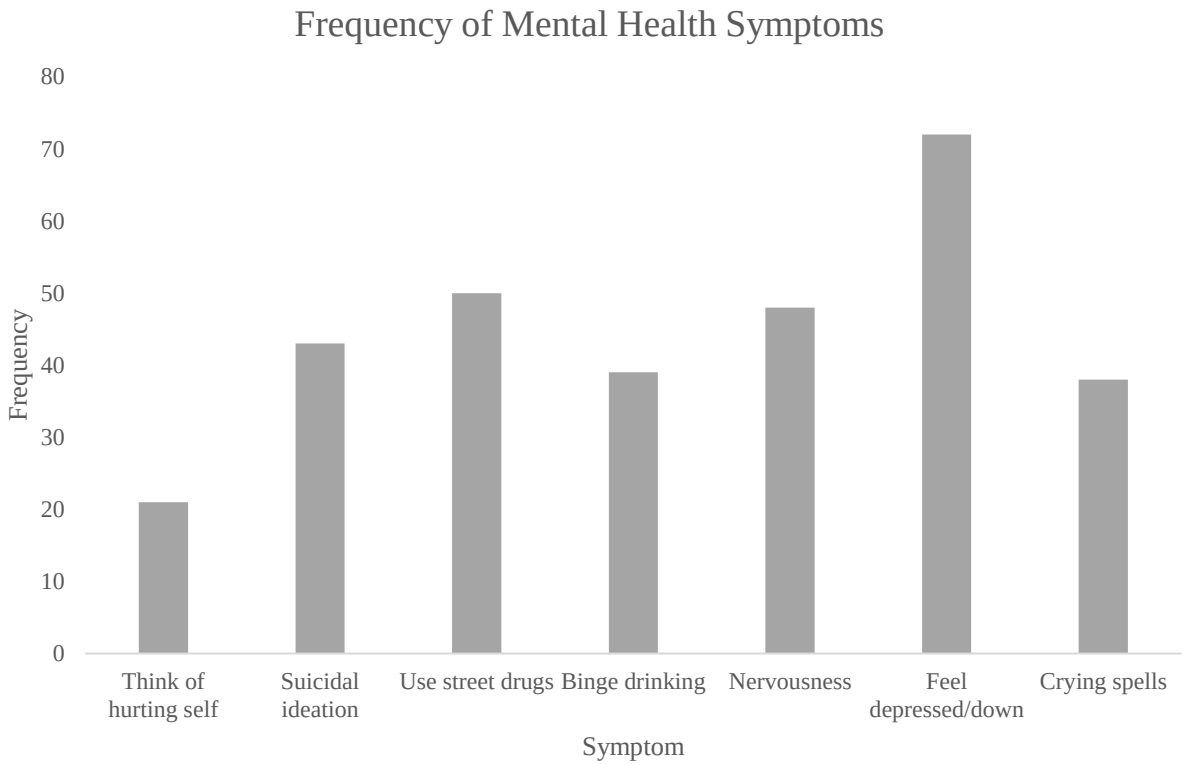
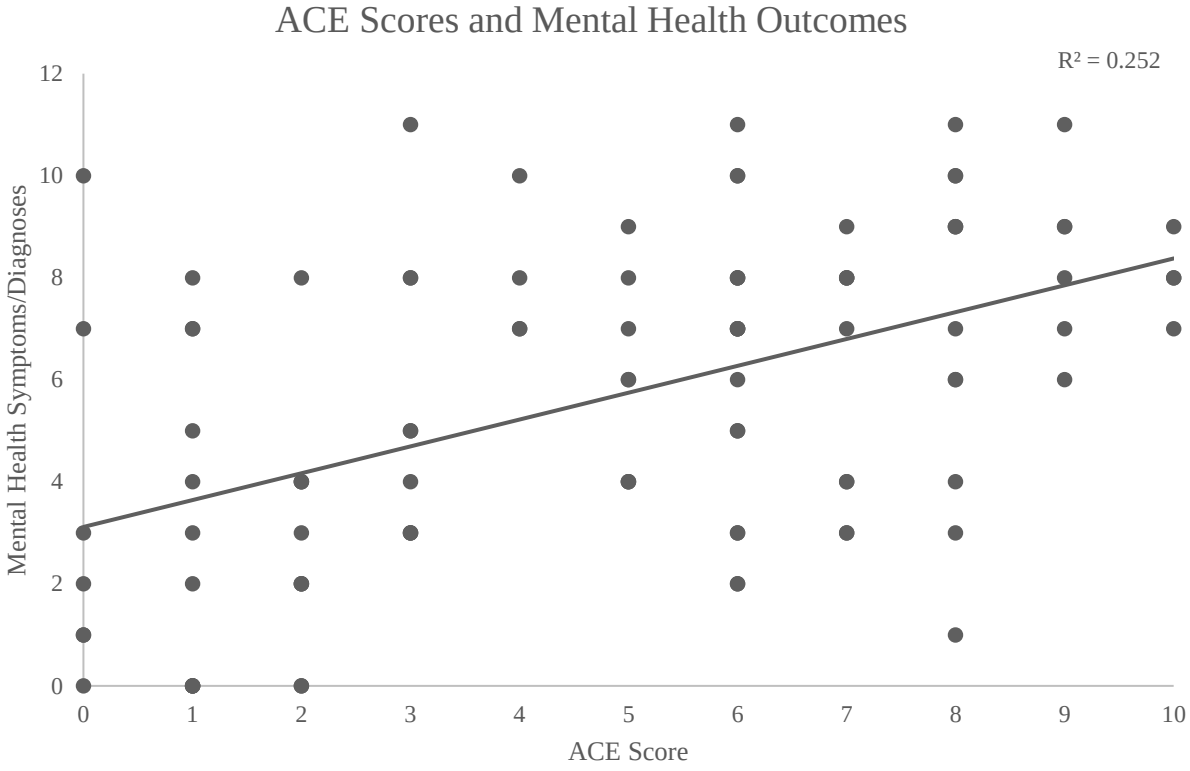


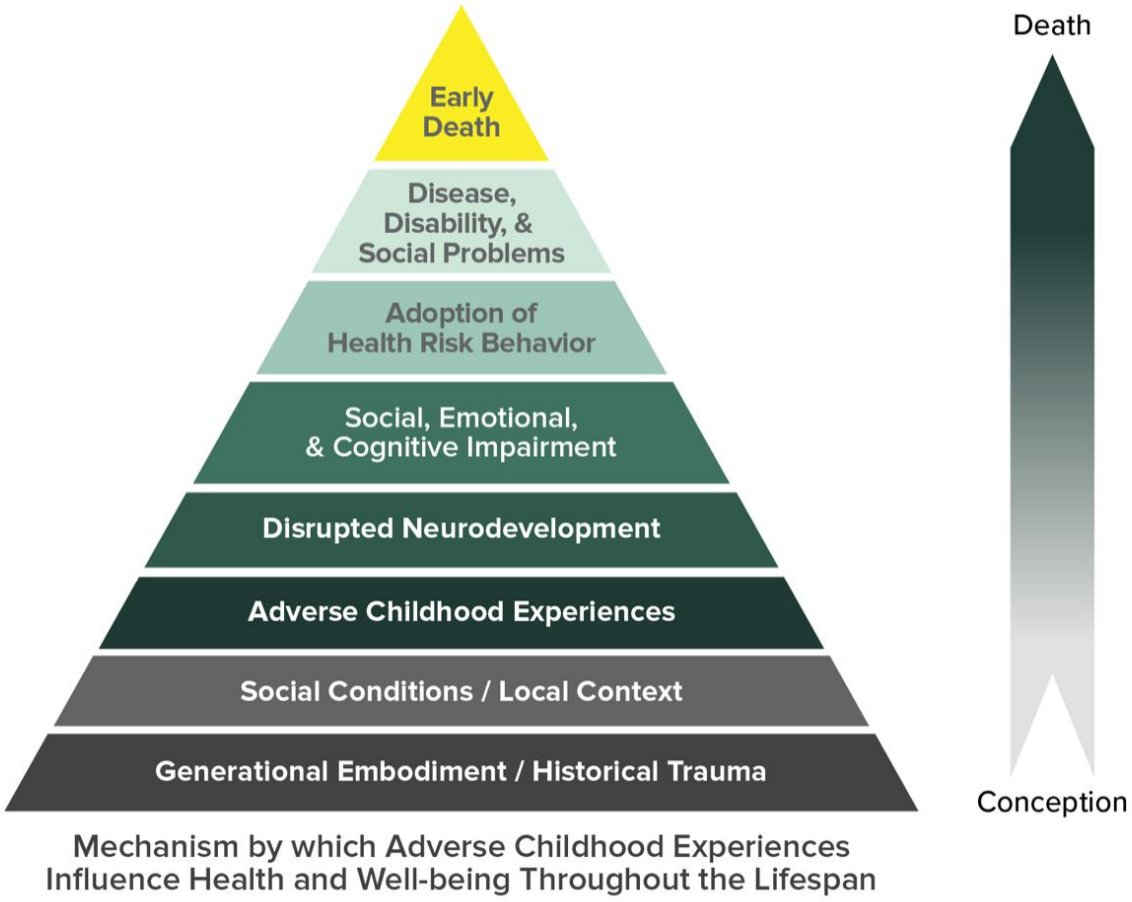
Figure 5

Scatterplot for the Linear Regression of ACE Score and Total Mental Health Symptoms/Diagnoses.



Appendix A

The ACEs Pyramid.



Mechanism by which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan

Appendix B

The ACEs Questionnaire

Adverse Childhood Experience (ACE) Questionnaire
Finding your ACE Score ra hbr 10 24 06

While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household **often** …
   Swear at you, insult you, put you down, or humiliate you?
   or
   Act in a way that made you afraid that you might be physically hurt?
   Yes No If yes enter 1 _____

2. Did a parent or other adult in the household **often** …
   Push, grab, slap, or throw something at you?
   or
   Ever hit you so hard that you had marks or were injured?
   Yes No If yes enter 1 _____

3. Did an adult or person at least 5 years older than you **ever**…
   Touch or fondle you or have you touch their body in a sexual way?
   or
   Try to or actually have oral, anal, or vaginal sex with you?
   Yes No If yes enter 1 _____

4. Did you **often** feel that …
   No one in your family loved you or thought you were important or special?
   or
   Your family didn't look out for each other, feel close to each other, or support each other?
   Yes No If yes enter 1 _____

5. Did you **often** feel that …
   You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?
   or
   Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
   Yes No If yes enter 1 _____

6. Were your parents **ever** separated or divorced?
   Yes No If yes enter 1 _____

7. Was your mother or stepmother:
   Often pushed, grabbed, slapped, or had something thrown at her?
   or
   Sometimes or often kicked, bitten, hit with a fist, or hit with something hard?
   or
   Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?
   Yes No If yes enter 1 _____

8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?
   Yes No If yes enter 1 _____

9. Was a household member depressed or mentally ill or did a household member attempt suicide?
   Yes No If yes enter 1 _____

10. Did a household member go to prison?
    Yes No If yes enter 1 _____

Now add up your "Yes" answers: _____ This is your ACE Score

Appendix C: Demographics Survey Questionnaire

This Questionnaire will be asking you some questions about events that happened during your childhood; specifically the first 18 years of your life. The information you provide by answering these questions will allow us to better understand problems that may have occurred early in the life of at risk population.

Adverse Childhood Experience (ACE) Questionnaire

While you were growing up, during your first 18 years of life:

01 - Did a parent or other adult in the household often: Swear at you, insult you, put you down, or humiliate you? Or Act in a way that made you afraid that you might be physically hurt?

- Yes
- No

02 - Did a parent or other adult in the household often: Push, grab, slap, or throw something at you? Or Ever hit you so hard that you had marks or were injured?

- Yes
- No

03 - Did an adult or person at least 5 years older than you ever: Touch or fondle you or have you touch their body in a sexual way? Or Attempt or actually have oral, anal, or vaginal intercourse with you?

- Yes
- No

04 - Did you often feel that: No one in your family loved you or thought you were important or special? Or Your family didn't look out for each other, feel close to each other, or support each other?

- Yes
- No

05 - Did you often feel that: You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? Or Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?

- Yes
- No

06 - Were your parents ever separated or divorced?

- Yes
- No

07 - Were any of your parents or other adult caregivers: Often pushed, grabbed, slapped, or had something thrown at them? Or Sometimes or often kicked, bitten, hit with a fist, or hit with something hard? Or Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?

- Yes
- No

08 - Did you live with anyone who was a problem drinker or alcoholic, or who used street drugs?

- Yes
- No

09 - Was a household member depressed or mentally ill, or did a household member attempt suicide?

- Yes
- No

10 - Did a household member go to prison?

- Yes
- No

ACE Demographic Questionnaire

Gender:

- Male
- Female

Race/Ethnicity:

- White
- African American
- Asian/Pacific Islander
- Hispanic
- Other

Age:

- 18-29
- 30-39
- 40-49
- 50-59
- 60+

Highest level of Education:

- Not high school grad
- High school grad
- Some college
- College graduate

Marital Status:

- Single
- Married
- Separated
- Divorced

Number of Children:

- 0
- 1-3
- 4-6
- 6+

Have you been homeless for a year or more?

- Yes
- No

How many recurring times have you been homeless in the past 5 years?

- 1-2
- 3-5
- 5-10
- 10+

Did you ever experience homelessness as a child (0-18)?

- Yes
- No

Were you ever in the Foster Care System?

- Yes
- No

Health Appraisal Questionnaire

Asthma or notice yourself wheezing?

- Yes
- No

Chronic bronchitis or emphysema?

- Yes
- No

Have you ever:

Been treated for TB or Coccidiomycosis (Valley Fever)?

- Yes
- No

Had a positive TB test?

- Yes
- No

Been a smoker?

- Yes
- No

Had lung cancer?

- Yes
- No

Do you chew tobacco?

- Yes
- No

If currently a smoker, how many cigarettes a day?

- Number response

Have you ever had, or even been told you have:

High blood pressure?

- Yes
- No

Take blood pressure medicine?

- Yes
- No

A heart attack?

- Yes
- No

Take medicine to lower your cholesterol?

- Yes
- No

Do you get:

Pains or heavy pressure in your chest with exertion?

- Yes
- No

Episodes of fast heart beats or skipped beats?

- Yes
- No

Other heart problems?

- Yes
- No

Have you ever had, or been told you have:

An ulcer?

- Yes
- No

Gallstones or gallbladder problems?

- Yes
- No

Are you troubled by:

Frequent headaches?

- Yes
- No

Attacks of dizziness?

- Yes
- No

Have you ever:

Had seizures, convulsions?

- Yes
- No

Fainted or lost consciousness for no obvious reason?

- Yes
- No

Temporarily lost control of a hand or foot (paralysis)?

- Yes
- No

Had a stroke or "small stroke"?

- Yes
- No

Been temporarily unable to speak?

- Yes
- No

Are you troubled with:

Crying spells?

- Yes
- No

Depression or "feel down a lot"?

- Yes
- No

Much trouble with nervousness?

- Yes
- No

Do you currently or have you ever:

Sometimes drink more than is good for you?

- Yes
- No

Use street drugs?

- Yes
- No

Have you ever:

Had suicidal ideations?

- Yes
- No

Think of hurting yourself often?

- Yes
- No

Are you often troubled with or been diagnosed with any of the following mental illnesses?

Depression?

- Yes
- No

Anxiety?

- Yes
- No

Schizophrenia?

- Yes
- No

Bipolar disorder?

- Yes
- No

Other mood disorder?

- Yes
- No