International Journal of Social Science and Economics
ISSN 2766-5119 (Print) ISSN 2766-5127 (Online)
Vol. 1, No. 2, 2021
www.scholink.org/ojs/index.php/ijsse

Original Paper

Adverse Childhood Events and Their Association with Adverse Health Outcomes: A Sacramento County (California) Study

Tara R. Allison[1] & Oscar Wambuguh[2*]

[1] Pre-Professional Health Academic Program, California State University East Bay, 25800 Carlos Bee Blvd., Hayward, CA 94542, USA

[2] Department of Public Health, California State University East Bay, 25800 Carlos Bee Blvd., Hayward, CA 94542, USA

[*] Oscar Wambuguh, Department of Public Health, California State University, East Bay, 25800 Carlos Bee Blvd., Hayward, CA 94542, USA

Received: October 10, 2021 Accepted: November 15, 2021 Online Published: November 20, 2021

doi:10.22158/ijsse.v1n2p25 URL: http://dx.doi.org/10.22158/ijsse.v1n2p25

Abstract

Adverse Childhood Events (ACEs) may negatively impact mental, emotional, and physical health. The study's main goal was to understand ACEs and associated adverse health outcomes, specifically focusing on the ACE exposures to Sacramento County residents. Sacramento County was chosen as it includes a big metropolitan community of about 1.5 million people. PubMed was used to identify research articles on the correlation between ACEs and adverse health outcomes during adulthood, and the disparities in healthcare services provided to County residents. Generally, the results demonstrate that ACEs are associated with a range of negative health outcomes. There is a need for interventions to mitigate the adverse impact that ACEs have on the health of both pediatric and adult populations. Studies indicate that County residents have a high probability of experiencing an ACE exposure or a set of circumstances that exacerbate the effect of ACEs. Some examples of ACEs specific to residents include low socioeconomic status or severe economic hardship, medical trauma, household dysfunction, discrimination, hunger, limited resource accessibility, and poor mental health. Despite the incomplete knowledge on ACEs from a biological standpoint, unpredictable range of ACE health outcomes, and non-standardized treatment protocols, data support that ACEs adversely impact the health status of residents, and studies support intervention.

Keywords

ACEs, health, health outcomes, Sacramento County, disparities, residents

1. Introduction

Adverse Childhood Events (ACEs) are mentally and emotionally traumatic experiences that may occur during adolescence. If unaddressed, ACEs can cause significant stress undermining physical and mental health over long periods, potentially into adulthood. A variety of circumstances can be categorized as ACE exposures. These include experiences such as neglect, maltreatment, and abuse which can harm an individual psychologically, emotionally, and physically. In addition, various forms of household dysfunction are classified as ACEs, such as alcohol or drug abuse, parental divorce or separation, parental mental illness, and domestic violence (Barnes et al., 2020). Recent research has identified newer ACEs, including low socioeconomic status or severe economic hardship, homelessness, discrimination, hunger, victimization from bullying, medical trauma, disasters, and war (Barnes et al., 2020). In general, the more ACEs a patient is exposed to, the higher the risk of developing negative health outcomes. Therefore, ACEs are considered a health burden and researchers strongly suggest a variety of interventions. (Ainsworth et al., 2019).

Sacramento County is located in northern California on the west coast of the United States. The 994 square mile region contains both urban and rural areas which are home to a population of ~1,550,000 residents (Sacramento County Government, 2020). The United States Census Bureau estimated that the 2019 Sacramento County resident population is 62.8% white, 43.8% white and not Hispanic or Latino, 23.6% Hispanic or Latino, 17% Asian, 10.9% Black or African American, 6.5% are two or more races, 1.5% are American Indian and Alaska Native, and 1.3% are Native Hawaiian or Pacific Islander (U.S. Census Bureau, 2020). Accordingly, the most commonly spoken non-English languages are Spanish, Chinese, and Vietnamese. This county employs 742,000 individuals, with the largest industries being healthcare, retail trade, and public administration respectively. Higher paying industries include oil and gas extraction, mining, and company management. The median household income from 2015-2019 in this county is $67,151, which is lower than the California income median of $75,235. Furthermore, the average male income is 1.26 times higher than female income, a pay gap that exceeds the national average (Data USA, 2020). Moreover, the percentage of Sacramento County residents in poverty is 12.6%, which is higher than the California average of 11.8% (U.S. Census Bureau, 2020).

Residents in this County have a high risk of experiencing an ACE exposure or circumstances that exacerbate the effect of ACEs. These include low socioeconomic status or severe economic hardship, medical trauma, household dysfunction, discrimination, hunger, limited resource accessibility, and poor mental health. Some challenges to residents utilizing support resources include limited access to health, inadequate knowledge on ACEs from a biological standpoint, the unpredictable range of ACE health outcomes, and non-standardized treatment protocols. This study presents the results of a literature review on ACEs and adverse health outcomes, focusing on the ACE exposures that Sacramento County residents experience.

2. Method

The database *PubMed* was used to select scientific articles focusing on the impact of ACEs on adolescents during adulthood, and data describing the healthcare status of Sacramento County residents. The search results were narrowed using the following keywords: adverse childhood events, adulthood, community health needs assessment, and Sacramento. Publications were selected based on two criteria: data on the impact of ACEs in children, and data on Sacramento County residents. To meet the first criterion, publications that analyzed the correlations between ACEs and adverse health outcomes during adulthood were selected. To meet the second criterion, publications that analyzed the disparities in healthcare services provided to Sacramento County residents were selected. To ensure currency of the research only articles from the past 5 years were reviewed and analyzed.

3. Results and Discussion

3.1 Association between ACEs and Harmful Health Outcomes

ACE exposures are associated with various physical, mental, and emotional health problems. Barnes et al. (2020) reported that adolescents with at least one ACE exposure demonstrated a higher risk for developmental delays, behavioral problems, and obesity. The authors indicated that ongoing stress due to ACEs causes an increased risk for diabetes, cancer, heart disease, substance abuse, and suicide. A study by Herzog and Schmahl (2018) explored the association between ACEs and mental, physical, and neurological health. The results indicated that adult outcomes of ACEs are multifaceted because multiple mental and physical disorders can be present simultaneously. Potential co-occurring outcomes included obesity, diabetes, depression, borderline personality disorder, and post-traumatic stress disorder (Herzog & Schmahl, 2018).

Campbell et al. (2016) analyzed the connection between ACEs and high-risk health behaviors that lead to physical afflictions. Respondents with four or more ACE exposures had a high chance of developing physical conditions such as myocardial infarction, coronary heart disease, stroke, diabetes, disabilities, and habits such as excessive drinking and smoking. A study by Chang et al. (2019) analyzed the correlation between ACEs and chronic diseases, smoking, and drinking. The study reported that an increase in ACE exposures is associated with an increase in risk for chronic disease and drinking, but not smoking. Waehrer et al. (2020) analyzed the impact and health outcome patterns of ACEs across 14 US states. The study demonstrated a direct relationship between an increase in ACE exposures and obesity, smoking, heavy drinking, arthritis, chronic obstructive pulmonary disease, cardiovascular disease, asthma, and depression across every state. Notably, the results revealed a positive correlation between ACEs and chronic obstructive pulmonary disease, asthma, cardiovascular disease, arthritis, and depression (Waehrer et al., 2020).

Further, Morris et al. (2019) demonstrated that ACEs and severe socioeconomic deprivation are associated with heightened inflammatory symptoms, dysfunction of the hypothalamic-pituitary-adrenal axis, and neurological and autoimmune diseases. This is due to epigenetic changes, such as DNA

methylation and acetylation, which occur due to inflammation caused by reactive oxygen and nitrogen species, nuclear factor-κB, and pro-inflammatory cytokines. The hypothalamic-pituitary-adrenal axis can malfunction due to epigenetic and inflammatory changes in the body (Morris et al., 2019). Further evidence of biological stress due to ACEs is demonstrated by Esteves et al. (2020). Information was collected using a questionnaire for experienced mothers and measured stress before and after pregnancy. The study showed an association between the number of maternal ACE risk exposures and infant telomere length. Telomere length is used as a biomarker indicator of early-life adversity in infants; hence, a measuring tool for inherited biological stress. Telomere length was reported to be shorter in infants with mothers who have a higher number of ACE exposures (Esteves et al., 2020). Moreover, Morris et al. (2019) reported that the ACEs and severe socioeconomic deprivation also induce biological damage to brain mitochondria. These organelles become malformed and begin to malfunction because of damaged DNA caused by psychological distress. Barnes et al. reported that psychological stress due to ACE exposures is a toxic strain on the body associated with altered gene expression and physical maturation (2020). These biological changes can be harmful during adulthood because they manifest as inflammatory and epigenetic-based diseases.

Beyond the harmful physical health outcomes of ACEs, research demonstrates that ACE exposures are associated with negative mental and emotional outcomes. Chang et al. (2019) also analyzed the correlation between ACEs and post-traumatic stress disorder and depression. The study found that an increase in ACE exposures is associated with an increased probability of developing both health conditions—but the risk was higher for depression compared to post-traumatic stress disorder. The authors concluded that ACE exposure during adolescence is associated with various negative mental and physical health outcomes during adulthood (Chang et al., 2019). Likewise, according to Campbell et al.'s study (2016), respondents with four or more ACE exposures had a high chance of developing depression. Sciolla et al. (2019) provided a web-based survey to 98 students, which included the ACE questionnaire and questions gauging each student's awareness of the impact of ACEs on their health. Students with four or more exposures demonstrated a significantly higher chance of reporting mental health problems than students with fewer than four exposures. The authors concluded that although a small percentage of students had multiple ACE risk exposures; those who did had a high risk of developing mental health problems. In addition to the harmful impact on mental health, ACE exposures can increase the risk of negative emotional health outcomes. Clements-Noelle et al. (2018) analyzed the correlation between ACEs and sexual identity with suicidal behaviors in high school students. The results demonstrated that lesbian, gay, or bisexual students with a high number of ACE exposures had an elevated a high chance of suicide contemplation or actions. The authors expressed the need for trauma-informed care to mitigate these health outcomes (2018).

Left unaddressed, ACE exposures may create negative health outcomes that persevere into adulthood, inadvertently influencing children in the subsequent generation. Schickedanz et al. (2018) studied the association between parental ACE exposures and the prevalence of behavioral problems in their

children such as attention-deficit and hyperactivity disorders, and emotional disturbances. Parents with four or more ACE exposures had children that demonstrated higher probabilities of behavioral health problems, hyperactivity, and emotional disturbances. Notably, Herzog and Schmahl (2018) proposed that the timing and type of ACE exposure can negatively impact the body during the neurological developmental phases of adolescence. Specifically, these neurological changes may alter the function or morphology of the hippocampus and amygdala (Herzog & Schmahl, 2018). Schickedanz et al. (2018) indicated that paternal ACE exposures showed a weaker association with adolescent behavioral issues than did maternal ACEs, which were more pronounced. The authors called for the need to address parental ACE exposures to reduce the negative inter-generational impact on adolescents. Schickedanz et al. (2019) examined the association between ACE exposure and ACE-associated household medical expenses by analyzing the adjusted annual out-of-pocket medical costs using linear regression models. Up to two ACE exposures cost $184, while three or more ACE exposures cost $311 in annual out-of-pocket medical costs. Furthermore, household medical debt was 2.29-fold higher for adults with three or more ACE exposures (Schickedanz et al., 2019).

3.2 Challenges Associated with a better Understanding of ACEs

Although many studies call for the need to address ACE exposures in a variety of ways, there are challenges associated with treating them. Waehrer et al. (2020) demonstrated that it is difficult to predict the way in which an ACE exposure will manifest as a health outcome. The researchers analyzed the health outcome patterns of ACEs across 14 states, and they concluded that each state displayed variable health outcomes with a high number of ACE exposures. Notably, cancer and diabetes did not consistently correlate with a high number of ACE exposures (Waehrer et al., 2020). Herzog and Schmahl (2018) emphasized the need to develop accurate diagnostic biomarkers to better identify and treat the physical and psychological impacts of ACEs. Morris et al. (2019) supported this assertion by indicating the need for continued research in this field. A final challenge is demonstrated by Barnes et al.'s (2020) study which examined the challenges associated with screening, identifying, treating, and preventing ACEs. The authors report that the primary difficulties include lack of standard clinical procedures and identifiable biomarkers of stress caused by ACEs. Despite the barriers to screening and treating ACEs, researchers emphasize the importance of mitigating ACEs and are making progress toward developing a standardized treatment method.

Our current understanding of the biological mechanism underlying ACE exposures is limited because research on the biological basis of ACEs continues; and recognizing the pattern of ACE-associated health outcomes is challenging. Additionally, there is a lack of standard clinical procedures and identifiable biomarkers of stress caused by ACEs. Despite these challenges, researchers indicate the need for intervention to mitigate ACE exposures using existing tools. Notably, Barnes et al. (2020) highlighted some protocols in development to successfully mitigate ACEs. The authors provided data to support the procedure for screening and treating ACEs and describing it when it is clinically relevant to do so.

3.3 Prevalence and Causes of ACE Exposures in Sacramento County

3.3.1 Low Socioeconomic Status or Severe Economic Hardship

With an estimated population of 1,552,058 people (US Census Bureau, 2021), Sacramento County is a prime example of a community which demonstrates a need for ACE mitigation. The median household income in Sacramento is $57,509, which is lower than the $63,783 median household income in California. Additionally, 23.1% of children under the age of 18 in Sacramento live in poverty, which is higher than the 19.9% of children under the age of 18 living in poverty in California (Ainsworth et al., 2019; US Census Bureau, 2021). The combined conditions of low socioeconomic status, severe economic hardship, and poverty have previously been identified as ACE exposures associated with negative health outcomes (Barnes et al., 2020). Studies concerning the health status of Sacramento County residents report on existing ACE exposures in addition to factors that exacerbate previously existing ACEs in this region. Accordingly, the most common ACEs that Sacramento County residents face include low socioeconomic status or severe economic hardship, medical trauma, household dysfunction, discrimination, hunger, limited resource accessibility, and poor mental health (Ainsworth et al., 2019).

3.3.2 Medical Trauma

Ainsworth et al.'s (2019) study reported that 6.1 homicides occur per 100,000 residents in Sacramento, which is 22% higher than the average number of homicides per 100,000 residents in the State of California. The study also indicated that there are 523.2 violent crime offenses per 100,000 residents in Sacramento, which is 29% higher than the violent crime offenses per 100,000 residents in California. Furthermore, there is a high frequency of shootings in Sacramento raising the odds of experiencing medical trauma from a violent attack in the region. Additionally, Wagner and Rosenbaum (2016) reported that pediatric Emergency Department admission rates were 50% higher in Sacramento than the surrounding regions due to substance abuse, mental health issues, and asthma. Thus, there is a strikingly higher probability of pediatric hospital visitation due to these issues. Ainsworth et al. (2019) noted that Sacramento County had 9.2 motor vehicle crash deaths per 100,000 residents, which is 8% higher than the Californian average of motor vehicle crash deaths per 100,000 residents. Moreover, there are 37.1 preventable hospital stays per 1,000 *Medicare* enrollees in Sacramento, which is 2.5% higher than those reported per 1,000 *Medicare* enrollees in California (Ainsworth et al., 2019). This demonstrated that the probability of experiencing medical trauma from hospital stays or familial crash deaths are high in Sacramento. Since medical trauma is an ACE exposure event reported in Barnes et al.'s study, Sacramento residents are therefore at increased risk for experiencing adverse health outcomes (2020).

3.3.3 Household Dysfunction and Family Health

Ainsworth et al. (2019) reported that 35.6% of households in Sacramento are headed by a single parent, which is 3.8% higher than the State of California average. Residents also lack sufficient access to mental health services and wait for long periods to obtain existing mental healthcare. This suggests that many adults may experience untreated mental health issues, potentially impacting family members and

children within households. Barnes et al. (2020) reported that parental mental illness and household dysfunction caused by parental divorce or separation are ACE exposure events indicating that Sacramento residents have high odds of negative health outcomes arising from these conditions. Healthcare access is dependent on the geographical location and specificity of services provided by existing healthcare organizations. In Sacramento County, healthcare organizations provide specific types of services and are distributed irregularly creating populations who receive sufficient healthcare services, and others who do not (Ainsworth et al., 2019). Wagner and Rosenbaum (2016) reported that a higher percentage of Sacramento residents do not have health insurance compared to the California state average.

3.3.4 Discrimination

Ainsworth et al. (2019) reported that the Sacramento County government is not culturally or racially representative of the community and law enforcement does not work closely with the community. This indicates that residents may experience discrimination due to the poor cultural competency in the region. This may occur through legislation that misrepresents residents or negative interactions with law enforcement officers. Additionally, primary healthcare access is affected due to discrimination brought about by selectivity in insurance type. For example, Sacramento residents with *Medi-Cal* insurance have little to no options for healthcare in the region. Barnes et al. (2020) reported that discrimination is an ACE exposure and may induce negative health outcomes.

3.3.5 Hunger

Sacramento County is considered a food desert with little to no access to fresh produce; hence, residents consume a less nutritious diet because lack of options in readily accessible fruits and vegetables. Horino and Yang (2021) studied the association between ACEs and the consumption of fruits and vegetables during adulthood. The researchers used data from the 2017 Nevada Behavioral Risk Factor Surveillance System in a cross-sectional analysis and used multiple logistic regression analyses were used to analyze this potential association in 2,393 adults. The results demonstrated that adults with multiple ACE exposures ate fewer fruits and vegetables; however, the association was not evident. The researchers emphasized that intervention is necessary to reduce ACE exposure and increase fruit and vegetable intake (Horino & Yang, 2020). This finding suggests that the food desert situation in Sacramento may be exacerbating the impact of existing ACE exposures.

3.3.6 Resource Accessibility

Sacramento County is reported to have poor public transportation serving the community, thus reduced ability to access medical care and resources for healthy living. Educational programs are reportedly underfunded, leaving school children with fewer educational resources and therefore low-quality education. There are also few after-school programs support student interpersonal skill development through regular physical education and healthy nutrition. These factors frustrate escalate the current conditions with little hope of improving socioeconomic status and promoting knowledge on maintaining physical and mental wellbeing. Lack of essential resources have been shown to be associated with ACEs

(Barnes et al., 2020).

3.3.7 Mental Health

Studies support the likelihood of Sacramento County residents experience ACE exposures that need to be medically addressed to improve their mental health of individuals. Ainsworth et al. (2019) reported that young populations require more mental health services to address ACEs. Sciolla et al. (2019) demonstrated that ACE exposures negatively impact mental health status during adulthood. Studies report that the number of mental health providers, psychiatrists, and primary care physicians is higher in Sacramento than the average benchmark in California. However, Sacramento residents more frequently experience poor mental and physical health than California residents in general (Ainsworth et al., 2019). This may suggest several things: 1) available clinicians are aggregated in certain regions thereby creating shortages elsewhere; 2) transportation is a major barrier to access clinician offices; 3) there is a lack of services to screen and treat ACEs; and 4) environmental factors like pollution may exacerbate ACE exposures in the community (Ainsworth et al., 2019).

4. Conclusion

Families in Sacramento County face multiple life history and locational challenges. Chief among them are low socioeconomic status, severe economic hardship, parental mental illness and household dysfunction, medical trauma, discrimination, limited food resources and hunger, and limited resource accessibility. Sacramento residents have therefore high odds of negative health outcomes and ACEs arising from the prevalence of these conditions. ACE exposures are associated with various health problems as young people grow older including a higher risk for developmental delays, behavioral problems like borderline personality disorder, substance abuse, depression, likelihood of committing suicide, post-traumatic stress disorder, an increased risk for diabetes, obesity, cancer, and heart disease. There are a number of challenges associated with mitigating ACE exposures wherever they occur, including: 1) a lack of identifiable biomarkers of stress caused by ACEs; 2) non-standard clinical procedures; 3) limited knowledge of the biological basis of ACEs; 4) the large and unpredictable range of negative health outcomes caused by ACEs; and 5) limited access to health and wellness resources for communities. While interventions are possible for Sacramento County residents who have developed adverse health outcomes, there are limitations that prevent residents from being adequately treated. Researchers collectively support intervention to reduce the prevalence of ACEs and improve the health status of communities.

5. Study Limitations

This study was limited by up-to-date biological ACE studies conducted within the past 5 years, and inadequate studies comparing ACEs and their health outcomes across multiple locations. Consequently, solutions needed to mitigate ACEs can only be resolved with continued research on these topics. Meanwhile, the adverse health outcomes associated with ACEs require continued monitoring, prevention

and mitigation.

References

Ainsworth, D., Diaz, H., & Schmidtlein, M. (2019). *2019 Community Health Needs Assessment(UC Davis Health)*. Retrieved September 14, 2021, from https://health.ucdavis.edu/community_relations/pdf/Community-Health-Needs-Assessment.pdf

Barnes, A. J., Anthony, B. J., Karatekin, C., Lingras, K. A., Mercado, R., & Thompson, L. A. (2020). Identifying adverse childhood experiences in pediatrics to prevent chronic health conditions. *Pediatric Research*, *87*(2), 362-370. https://doi.org/10.1038/s41390-019-0613-3

Campbell, J. A., Walker, R. J., & Egede, L. E. (2016). Associations Between Adverse Childhood Experiences, High-Risk Behaviors, and Morbidity in Adulthood. *American Journal of Preventive Medicine*, *50*(3), 344-352. https://doi.org/10.1016/j.amepre.2015.07.022

Chang, X., Jiang, X., Mkandarwire, T., & Shen, M. (2019). Associations between adverse childhood experiences and health outcomes in adults aged 18-59 years. *PloS One*, *14*(2), e0211850. https://doi.org/10.1371/ journal.pone.0211850

Clements-Nolle, K., Lensch, T., Baxa, A., Gay, C., Larson, S., & Yang, W. (2018). Sexual Identity, Adverse Childhood Experiences, and Suicidal Behaviors. *The Journal of Adolescent Health*, *62*(2), 198-204. https://doi.org/10.1016/j.jadohealth.2017.09.022

Data USA. (2020). *Data USA: Sacramento County, CA*. Retrieved September 14, 2021, Retrieved September 14, 2021, from https://datausa.io/profile/geo/sacramento-county-ca#economy

Esteves, K. C., Jones, C. W., Wade, M., Callerame, K., Smith, A. K., Theall, K. P., & Drury, S. S. (2020). Adverse Childhood Experiences: Implications for Offspring Telomere Length and Psychopathology. *The American Journal of Psychiatry*, *177*(1), 47-57. https://doi.org/10.1176/appi.ajp.2019.18030335

Herzog, J. I., & Schmahl, C. (2018). Adverse Childhood Experiences and the Consequences on Neurobiological, Psychosocial, and Somatic Conditions Across the Lifespan. *Frontiers in Psychiatry*, *9*, 420. https://doi.org/ 10.3389/fpsyt.2018.00420

Horino, M., & Yang, W. (2020). Impact of adverse childhood experiences and fruit and vegetable intake in adulthood. *Public Health Nutrition*, *24*(5), 1034-1041. https://doi.org/10.1017/S1368980019004932

Morris, G., Berk, M., Maes, M., Carvalho, A. F., & Puri, B. K. (2019). Socioeconomic Deprivation, Adverse Childhood Experiences and Medical Disorders in Adulthood: Mechanisms and Associations. *Molecular Neurobiology*, *56*(8), 5866-5890. https://doi.org/10.1007/s12035-019-1498-1

Sacramento County Government. (2020). *Sacramento County Demographics and Facts*. Retrieved September 9, 2021, from https://www.saccounty.net/Government/Pages/DemographicsandFacts.aspx

Schickedanz, A., Halfon, N., Sastry, N., & Chung, P. J. (2018). Parents' Adverse Childhood Experiences and Their Children's Behavioral Health Problems. *Pediatrics*, *142*(2), e20180023. https://doi.org/10.1542/peds.2018-0023

Schickedanz, A. B., Escarce, J. J., Halfon, N., Sastry, N., & Chung, P. J. (2019). Adverse Childhood Experiences and Household Out-of-Pocket Healthcare Costs. *American Journal of Preventive Medicine*, *56*(5), 698-707. https://doi.org/10.1016/j.amepre.2018.11.019

Sciolla, A. F., Wilkes, M. S., & Griffin, E. J. (2019). Adverse Childhood Experiences in Medical Students: Implications for Wellness. *Academic Psychiatry: The Journal of the American Association of Directors of Psychiatric Residency Training and the Association for Academic Psychiatry*, *43*(4), 369-374. https:// doi.org/10.1007/s40596-019-01047-5

U.S. Census Bureau. (2021). *U.S. Census Bureau Quick Facts: Sacramento County, California*. Retrieved September 3, 2021, from https://www.census.gov/quickfacts/fact/table/sacramentocountycalifornia/ PST045219

Waehrer, G. M., Miller, T. R., Silverio Marques, S. C., Oh, D. L., & Burke Harris, N. (2020). Disease burden of adverse childhood experiences across 14 states. *PloS One*, *15*(1), e0226134. https://doi.org/10.1371/journal. pone.0226134

Wagner, J., & Rosenbaum, A. (2016). 2016 Sierra Health Community Needs Assessment. *Sierra Health Foundation*. Retrieved August 26, 2021, from https://www.sierrahealth.org/assets/pubs/HSC_CHNA_2016.pdf