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Research Proposal—Early Screening for ACEs in California Healthcare Settings: A Prospective Cohort Study

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Research Question

How is screening at an early age for Adverse Childhood Experiences (ACEs) in California health care settings effective in improving children/adolescents' physical and mental health and reducing negative health outcomes in adulthood?

Background & Literature Review

Adverse Childhood Experiences (ACEs) are traumatic events a child experiences before the age of 18. ACEs include physical, sexual, and emotional abuse alongside physical and emotional neglect (Felitti et al., 1998). Household dysfunction is another category of ACEs and refers to parental divorce/separation, domestic violence, or living with an adult who uses substances, is incarcerated, or has untreated mental health issues (Felitti et al., 1998). In recent years, researchers have increasingly recognized the importance of early life experiences in health outcomes (Petruccelli et al., 2019). ACEs affect around 58% of youth in the U.S. (Kajeepeta et al., 2015). A cross-sectional analysis of data from the 2016 National Survey of Children's Health (n= 45,287) found the most prevalent type of ACE exposure by children were economic hardships (22.5%) and parent divorce/separation (21.9%) (Crouch et al., 2019).

ACEs are also very common in California. According to the 2011-2017 California Behavioral Risk Factor Surveillance System (BRFSS) ACE module data, 62.3% of California adults have experienced at least one ACE. Similarly, 40.1% of California adults have experienced at least two ACEs, 26.1% three ACEs, and 16.3% have experienced four or more ACEs (California Department Public Health, 2020). California residents who experienced four or more ACEs before the age of 18, as compared to those who experienced zero, were approximately 3.5 times as likely to report frequent mental distress. They were also two times as likely to report fair/poor self-rated health, 2.8 times as likely to be a current smoker, and two times as likely to be at risk for acute drinking (California Department Public Health, 2020). Also, respondents who identified as Black and Hispanic were more likely to report four or more ACEs compared to California residents who identified as White or "other" race (California Department Public Health, 2020).

Studies have also found associations between ACEs and other poor health outcomes. For example, using data from the nationwide 2009-2012 Behavioral Risk Factor Surveillance System (n=52,250 adults aged 18-64), Monnat and Chandler (2015) found associations between ACEs and self-rated health, diabetes, heart attack, and functional limitations. Monnat and Chandler (2015) defined functional limitations as being limited in any activity because of physical, mental, or emotional problems. Participants who reported physical abuse in childhood had about 24% lower odds of being in a better health category (Monnat & Chandler, 2015). This study also found that experiencing any ACEs, except witnessing parental domestic violence, was associated with between 13% to 56% greater odds of having a functional limitation (Monnat & Chandler, 2015).

Similarly, a systematic review and meta-analysis of 96 articles by Petruccelli et al. (2019) found that females report more ACEs than males. This systematic review also found that non-white race, low education, and low socioeconomic status were significantly associated with reporting an ACE compared to not reporting an ACE (Petruccelli et al., 2019). ACEs are also associated with multiple sleeping disorders in adulthood (Kajeepeta et al., 2015). A meta-analysis of 10 articles found a 46% increase in the odds of adult obesity following exposure to multiple ACEs (Wiss & Brewerton, 2020).

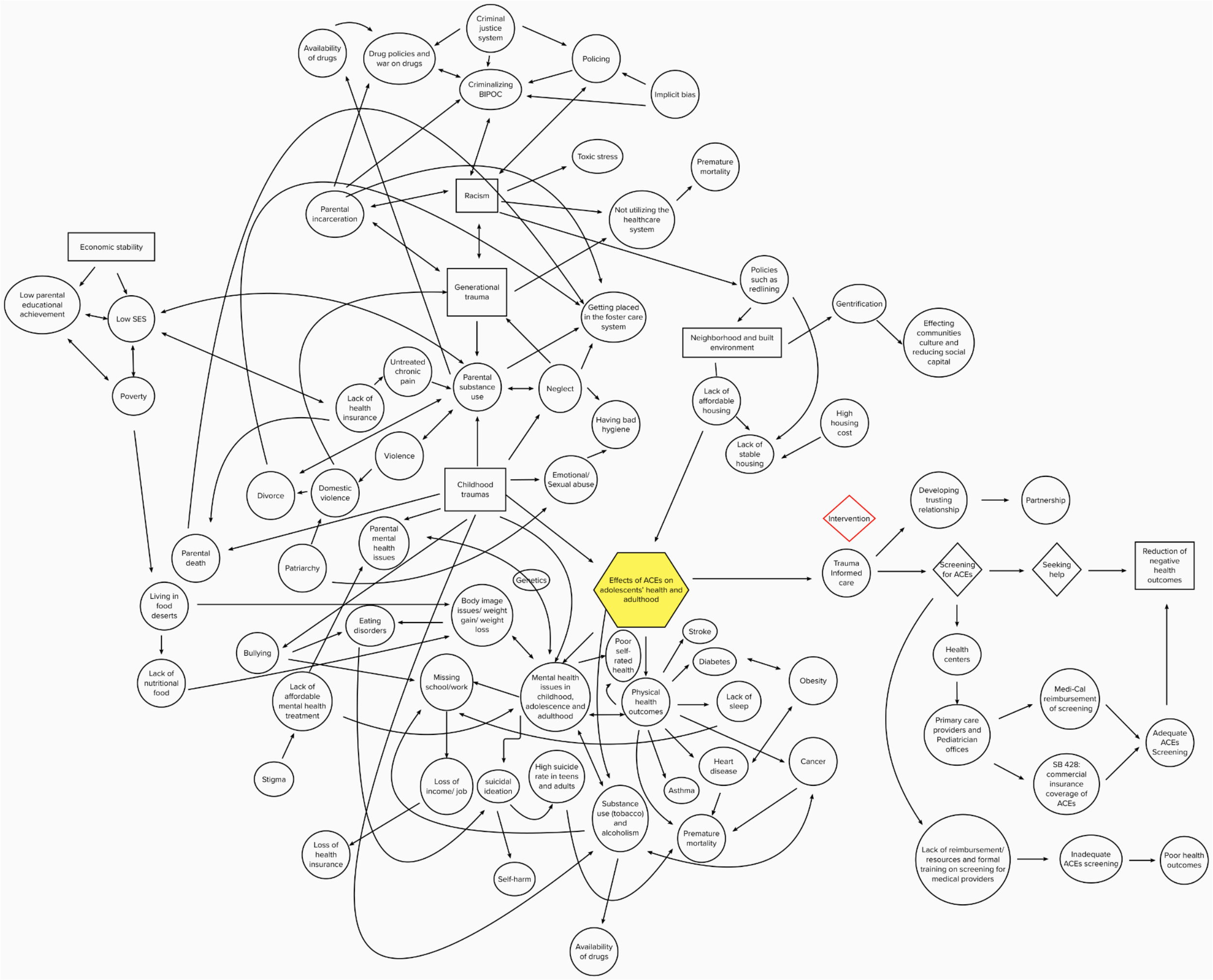
In recent years, California has taken the initiative to screen more individuals for ACEs. Since January 2020, California's Medicaid health care program, Medi-Cal, has reimbursed primary care providers for using Pediatric ACEs and Related Life-events Screener (PEARLS) tool to screen children and adolescents ages 0-19 for ACES during visits (Pérez Jolles et al., 2022). Additionally, as of October 2021, California has enacted SB 428, the ACEs Equity Act, which mandated commercial insurance coverage of ACEs screening in primary care visits (Shimkhada et al., 2022). Universal ACEs screening in health care settings can serve as a surveillance tool for providers to inform and guide medical practice and policy (Dube, 2018). However, there are several gaps in knowledge. In California, more data on early screening is needed. For example, in BRFSS, California residents retrospectively reported on ACEs they faced before the age of 18. The current policies in California that have expanded ACEs screening coverage are relatively new, so scientists have not thoroughly researched the effectiveness of early ACEs screening. Kajeepeta et al. (2015) assert that longitudinal studies among diverse populations are needed. Crouch et al. (2019) also highlight that most data on ACEs are retrospective, and identification of ACEs among children contemporaneously enhances the ability of providers to mitigate the negative outcome of ACEs through early intervention. The scientific community also needs to gather more data on socioeconomically and racially diverse urban populations because most ACEs data is collected from white middle-/upper-middle class participants (Cronholm et al., 2015). Cronholm et al. (2015) also emphasize that future research should focus on prospective studies. The literature review also found that most prospective cohort studies are conducted in Europe—Denmark, Netherlands, and the United Kingdom. There need to be more prospective cohort studies in the U.S. and California that examine the relationship between screening for ACEs and future health outcomes. This research proposal aims to close these gaps in knowledge by conducting a prospective cohort study in California—the most diverse state in the United States.

Significance and Conceptual Model

This project is needed because most ACEs data are retrospective, and there need to be more prospective cohort studies in the United States that examine the effectiveness of early screening for ACEs. One of the best ways to answer the research question is to conduct a prospective cohort study that examines the effectiveness of screening, which is precisely what is missing in ACEs research. There is also a need for socioeconomically and racially diverse ACEs data that represent the diverse population of the United States. Since California is the most diverse state, it is a great case study of the effectiveness of early screening for ACEs.

This research proposal is also both innovative and timely. Since the original ACEs study was conducted from 1995 to 1997 (Felitti et al., 1998), the scientific community has mostly focused on cross-sectional, retrospective studies. The studies were cross-sectional and retrospective in almost all meta-analyses in the literature review. This project considers these gaps by conducting a prospective cohort study in a survey format where participants will be followed for 30 years. Since these cross-sectional studies have already established the negative health consequences associated with ACEs, we can establish a temporal relationship with a prospective cohort study. This temporal framework will also allow us to assess causality. This study is also timely because of the passage of SB 428 and Medi-Cal reimbursing providers for ACEs screening. Now, more individuals have been screened for ACEs at an early age in California, but since ACEs screenings are not mandatory, many individuals still need to be screened. This will give us a good sample size of individuals who have been screened at an early age and those who have not.

Figure 1. Conceptual model of ACEs displaying the interplay of various factors that are associated with ACEs and poor health outcomes and how screening can serve as an intervention that can mitigate the negative health consequences



Approach: Project Description and Methods

This project proposes to collect new quantitative survey-based data through a longitudinal prospective cohort study. There will also be a youth and young adult council that will help guide this study. Selection criteria will be developed and followed over time to evaluate the occurrence of the outcomes of interest. Individuals from ages 0 to 19 who live in different regions of California (Northern, Central, and Southern California) will be eligible to be part of this study. There will be two groups in this study. The first group will be individuals who have been screened at an early age for ACEs in pediatric and primary care offices—exposed group. The unexposed group will be individuals of similar ages and other backgrounds who have not been screened for ACEs at an early age but will get screened at the end of the study. This will be the retrospective aspect of this study, where the unexposed group's physical and mental health outcomes will be measured and, retrospectively, determine if they had any ACEs as children.

The sample size would be around 2000 individuals. The sample size may decrease over time, and some participants may fail to respond to surveys. Considering all of these factors, this sample size is acceptable because it takes into account that this project requires a large number of resources. Since the sample size is likely to decrease over time, this sample size gives the researchers a good buffer of participants, and the size will be manageable for the researchers.

The researchers of this study will analyze the data collected through surveys by calculating risk and rate ratios. The investigators will compare the exposed and unexposed groups against each other to identify if early screening helped reduce mental health outcomes such as depression and anxiety and physical health outcomes such as diabetes, heart disease, cancer, asthma, obesity, and sleeping disorders. The data will be collected through yearly surveys, and the participants will be followed over 30 years. This time frame has been selected because some chronic physical conditions need decades to be developed.

The researchers will collect general demographic questions such as age, sex, race/ethnicity, marital status, level of education, household income, and employment status. One of the outcome variables will be self-rated health. The participants will be asked to answer the following question: In general, how would you rate your health—excellent, very good, good, fair, or poor? Additionally, the researchers will administer PHQ-9 (Patient Health Questionnaire-9). PHQ-9 will assess the degree of depression severity via a 9-item questionnaire. Researchers will also administer GAD-7 (Generalized Anxiety Disorder 7), a self-reported questionnaire for screening and measuring generalized anxiety disorder. For different physical health outcomes such as diabetes, heart disease, cancer, asthma, obesity, and sleeping disorders, the researchers will ask the following question: Have you been told by a health care professional that you have any of these conditions? There will be a separate question for each health condition. The researchers will collect self-rated health, PHQ-9, GAD-7, and physical health outcomes at the yearly follow-up sessions over 30 years.

This study requires a large amount of funding and resources. The investigators need to follow up with individuals over 30 years. The survey questions, PHQ-9, GAD-7, ACEs screening, and other survey materials might need to be translated into the language participants can understand. There are several limitations that merit consideration. Due to the study design being a prospective cohort study, this study will be costly and time-consuming. There will also be attrition problems and a potential loss of several participants in follow-ups. Participants may outlive the investigators, and the participants in the unexposed group who will be retrospectively screened for ACEs might not recall their childhood experiences correctly. There is also uncertainty about how many participants will develop the health outcomes of interest.

Community Engagement and dissemination

For this project, the community consists of the participants, health care providers, especially those in pediatrician offices and primary care providers, parents, policymakers, and the scientific community. It is essential to include the community to be part of this research; thus, there will be a community advisory board, and youth and young adults will be encouraged to be part of the board. The investigators will ask for advice, especially on disseminating the information effectively to the community. Investigators will also contact the advisory board to seek help whenever they encounter problems. The community's involvement could alter the research question. Specifically, due to the nature of the method being a prospective cohort study, the insights of the board can help the researchers ask new questions as they come up. Also, throughout the 30-year research project, a lot will change. Consequently, the board can identify how the community has changed throughout these years to inform the researchers and better direct the research question. The community's insight will be immensely beneficial. The researchers will manage the community's involvement by finding the right balance between the original direction of the research question and the new insights from the board that might have changed the research question slightly.

The intervention/policy that might arise from this research is to mandate screening at an early age in California, which has already expanded ACEs screening coverage for both Medi-Cal recipients and those with private health insurance. Across the U.S., the intervention would be to pass a policy that expands the ACEs screening coverage in health care settings and potentially mandates screening. While the community (participants, parents, and health care providers) is not the decision-maker for this policy/intervention, the investigators could encourage them to engage with policymakers. For example, the community could contact their representatives/elected officials and share why this policy matters. The community could also lobby for this policy. The researchers could also engage with the policymakers by going to different advocacy summits, such as the society for public health education advocacy summit in Washington D.C., to share the results of their research.

The researchers will disseminate the result of this study to the scientific community and others by publishing papers in peer-reviewed academic journals. The researchers could also disseminate the results by creating reports such as a road map of the findings throughout the 30 years. These road maps will be an easy and engaging way to share the research findings with the community. The investigators could also participate in a series of events and webinars to report the research findings to the community advisory board. If the research results found early ACEs screening effective, the researchers could meet with legislatures to inform them of the effectiveness of screening. The researchers could use their findings and the 2020 California Surgeon General's Report on *Adverse Childhood Experiences, Toxic Stress, and Health*, which highlighted ACEs cost California around $112.5 billion annually—including personal health care spending and years of productive life lost (Bhushan et al., 2020). Sharing these results might encourage the legislators of other states across the U.S. to pass policies similar to California and realize intervention is financially more beneficial for their state. Also, the researchers could develop educational packets and print flyers about ACEs' effects on children's well-being in different health care settings, especially pediatricians' and OB-GYN offices. The researchers could target these educational packets toward parents because they are often the reason for ACEs.

Lastly, this research is beneficial because evidence from a 30-year prospective cohort study will be robust for both the scientific community and the policymakers. Additionally, the strong evidence from this study will be hard proof for parents and health care providers that early screening for ACEs lowers the burden of physical and mental health outcomes—if the results were to find that. This project could initiate change across the U.S. in ACEs screening. ACEs screening can lead to prevention, intervention, and treatment planning for mental and chronic health conditions and will help individuals mitigate the negative health consequences of ACEs.

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