

**Title:** The Effects of Adverse Childhood Experiences and Childhood Socioeconomic Disadvantage on Adolescent Depression and Suicidality: A Scoping Review Protocol

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**Abstract:**

Adolescent depression and suicidality are of increasing concern in the United States. Adverse childhood experiences (ACEs), or the cumulative exposure to different types of childhood adversity, and childhood socioeconomic disadvantage (SED) have both been individually associated with increased risk of depression and suicidality. However, there is a lack of consensus among experts in the field as to whether: 1) SED should be included among other equally-weighted adversities in ACE scales, 2) SED mediates the relationship between ACEs and mental health outcomes, or 3) SED exerts a unique influence on both ACEs and mental health outcomes. In order to assess the current literature on the independent and/or interactive effects of SED and ACE exposure on depression/suicidality-related outcomes, a review of the current literature will be conducted. The following paper describes the protocol for this scoping review and plans for the dissemination of findings.

**Background**

High rates of adolescent depression and suicidality, defined as suicidal ideation or attempt, in the United States have been of increasing concern in recent years (Centers for Disease Control and Prevention, 2021; Daly, 2022). Cumulative adverse experiences during childhood (i.e., adverse childhood experiences; ACEs), have been associated with many detrimental physical, mental and behavioral health outcomes including increased risk of depression and suicidality (Bellis et al., 2015; Campbell et al., 2016; Felitti et al., 1998; Jia et al., 2020; Merick et al., 2019). As our communities seek ways to address the current adolescent mental health crisis, it's important that we better understand the relationship between childhood adversity and mental health consequences.

The concept of adverse childhood experiences was first introduced by Felitti and colleagues (1998) and included measures of child abuse (physical, emotional and sexual), neglect (physical and emotional) and household dysfunction (e.g., a household member with mental illness or history of incarceration). However, disagreement among experts in the field have since led to expanded and altered ACE scales that include additional adversities such as discrimination, community violence, bullying, foster care placement, and socioeconomic disadvantage (SED; Cronholm et al., 2015; Finkelhor et al., 2013).

Some of these more recent additions to ACE scales require greater attention to assess their appropriate inclusion among other, equally-weighted adversities. Of particular interest is SED, often measured with various proxies including education, occupation, income, material hardship or deprivation and/or social class (American Psychological Association, 2015). Childhood SED itself has been associated with increased adolescent depression and suicidality, as well as other cumulative ACE exposures (Hoffmann et al., 2020; Tracy et al., 2008). While

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some may argue that this relationship between SED and ACEs is due to the clustering nature of ACEs, others posit that SED creates an environment of stress that then promotes ACE exposure (Andrews III et al., 2015; Jacobs et al., 2012). It is currently unclear whether SED exerts an independent effect on mental health outcomes similar to other ACEs, if ACEs mediate the relationship between SED and mental health outcomes, or if SED and other ACEs interact upon each other to influence mental health outcomes. In order to better understand this complex relationship, it's necessary to assess current literature to see how these variables have been analyzed independently and/or interactively with mental health outcomes, focusing on depression and suicidality.

## **Purpose**

The purpose of this scoping review is to assess the current state of the literature regarding the independent and/or interactive effects of both childhood socioeconomic disadvantage and ACEs, in relation to depression- or suicidality-outcomes.

## **Methods**

This review will be conducted and reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis for Scoping Reviews (PRISMA-ScR) guidelines (Tricco et al., 2018). Articles will be systematically retrieved from multiple databases, screened for inclusion by two reviewers, and analyzed for relevant data. An experienced informationist has assisted with the development of the search strategy. Data and reporting quality will be assessed using design-appropriate National Institutes of Health (NIH) Critical Appraisal tools and the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist (von Elm et al., 2014).

## **Inclusion and Exclusion Criteria**

Original, quantitative, peer-reviewed articles written in English and published between 1995-2022 will be included in this review. The year 1995 is included as a starting point because this time corresponds to the start of the seminal CDC-Kaiser ACE Study (Felitti et al., 1998). Qualitative studies, reviews, commentaries, news reports or magazines, conference abstracts or other sources of gray literature will be excluded from this review.

Included articles must assess SED as an independent, control, or moderating variable with measures described by the authors as proxies for socioeconomic status, poverty, or household income. If SED is included as a control variable, analyses demonstrating the effect of SED separate from other control variables must be included to identify the independent effects of SED on the outcome of interest. Due to the many proxies for SED and resource limitations, variables that might align with the definition of socioeconomic status (e.g., parent education or employment status) that are not specifically described as a measure of socioeconomic status by authors may not be included in the literature search results. Additionally, studies that only assess SED as part of a cumulative ACE measure will be excluded.

A cumulative assessment of at least three ACEs, using count measures, must also be included as an independent or control variable with the same stipulation applied for separate control variable reporting described above. ACEs may include any items from conventional ACE scales (including physical abuse; emotional abuse; sexual abuse; physical neglect; emotional

neglect; a household member with mental illness, history of criminal activity, or substance misuse; parental separation/divorce; or witnessing intimate partner violence) or expanded ACE scales (e.g., discrimination, unsafe neighborhoods, witnessing violence, bullying, foster care placement, property victimization, or being close to someone who had a bad accident/illness). Cumulative adversity measures that incorporate severity or frequency of ACE exposures will be excluded. Scales that include adversities that don't closely align with established ACE criteria or are ambiguous will be excluded. Moreover, adversity scales that are not limited to adverse exposures in childhood (birth to 18 years of age) will be excluded.

Articles must address mental health outcomes related to depression or suicidality including, but not limited to, depressive symptoms, depression diagnoses, history of past suicide attempts or suicidal ideation. To capture enough studies, these depression/suicidality outcomes can be assessed at any age including childhood, adolescence, or adulthood. If a sufficient number of articles are identified that focus solely on *adolescent* depression/suicidality, an age restriction for these mental health outcomes will be included to focus more on this high-risk population.

### **Search Strategy**

An extensive search strategy was developed and tailored with appropriate vocabulary and headings for four different databases in consultation with an experienced informationist. The databases to be searched are PubMed, PsycINFO, CINAHL and Scopus. English language and a time restriction set at 1995 will be applied to all searches. The complete search strategy for each database can be found in the supplementary files. Hand searching through the references of identified articles and using the discovery engine ResearchRabbit.ai will be conducted to identify other potentially relevant sources.

### **Screening and Selection**

Results from the initial database searches will be exported into EndNote20 and duplicates will be removed. Remaining articles will then be exported into Rayyan.ai software to assist with the screening process. Deduplication tools within Rayyan.ai will be used to double check that only unique articles remain. Two independent reviewers will screen titles and abstracts. The full-text of articles will be read as the final screen for inclusion in this scoping review. Two independent reviewers will conduct data extraction on all included articles. At each stage, a third reviewer will be available for discussion and resolution of any discrepancies. Inclusion and exclusion of articles will be tracked according to the PRISMA-ScR guidelines and documented in a flow diagram.

### **Data Extraction**

A custom data extraction table will be employed to identify relevant information from each included article and enable synthesis. The table will include information about study design, variables measured and study findings. Specific data to be extracted from each included article is described in Table 1. Two independent reviewers will read through the included articles to ensure full and accurate information is included in the final synthesis. Data and reporting quality will be assessed during the data extraction phase as previously described.

<b>Table 1. Data Extraction Categories for Each Included Study</b>	
<b>Study Characteristics</b>	<ul style="list-style-type: none"> <li>• Author(s), year</li> <li>• Study design/methodology</li> <li>• Sample size, country</li> <li>• Sample characteristics</li> </ul>
<b>Variables Measured</b>	<ul style="list-style-type: none"> <li>• ACEs measured, subscales</li> <li>• SED measures</li> <li>• Depression- or suicidality-related measures</li> <li>• How SED/ACE variables are analyzed (e.g., as independent, control, mediator or moderator variables)</li> <li>• Statistical analyses conducted</li> </ul>
<b>Findings</b>	<ul style="list-style-type: none"> <li>• ACE prevalence</li> <li>• Associations between ACEs and depression/suicidality-related outcomes, statistical significance</li> <li>• Associations between SED and depression/suicidality-related outcomes, statistical significance</li> <li>• If SED and/or ACEs are assessed as a mediator/moderator related to depression/suicidality-related outcomes, statistical significance</li> <li>• Other findings of interest</li> </ul>
<b>Critical Appraisal</b>	<ul style="list-style-type: none"> <li>• NIH quality assessment</li> <li>• STROBE reporting transparency</li> </ul>

**Literature Synthesis Results**

The data extracted from the included articles will be assessed to identify the types and quality of studies assessing our variables of interest. Study findings will be synthesized to identify any patterns or incongruencies in results related to the independent and/or interactive effects of SED and cumulative ACE exposure on depression/suicidality-related outcomes. Any other pertinent findings from the included articles will also be reported. Data extracted from all included articles will be analyzed to identify gaps in the literature.

**Dissemination**

The completed scoping review will be submitted for publication in a topically-related peer-reviewed journal. Findings will be submitted for presentation at conferences, and additional outlets (including social media and university-promoted press releases) will be accessed to reach broader audiences of interest.

**Supplementary Information**

Included in the appendix is the complete search strategy for each of the four databases.

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All authors have contributed substantially and meet authorship criteria per the Committee on Publication Ethics (COPE) guidelines.

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**Ethical and Institutional Review**

Not applicable

**Consent for Publication**

Not applicable

**Conflict of Interest**

All authors are free from competing interests.

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