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# Adverse childhood experiences and childhood autobiographical memory disturbance☆

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**Abstract**

**Objective:** To examine relationships between childhood autobiographical memory disturbance (CAMD) and adverse childhood experiences (ACEs) which are defined as common forms of child maltreatment and related traumatic stressors.
**Methods:** We use the ACE score (an integer count of eight different categories of ACEs) as a measure of cumulative exposure to traumatic stress during childhood. In a cross sectional analysis we assess the relationship of the ACE score to the prevalence of CAMD in a sample of 9,460 relatively healthy adults evaluated for wellness care at a southern California health maintenance organization between August 1995 and March 1996. In addition, we examined possible secular influences by examining association among each of four birth cohorts. Logistic regression was used to obtain the adjusted relative odds of CAMD associated with increasing ACE score.
**Results:** Overall, the age-standardized prevalence of CAMD was 18% (men: 15%; women: 19%). As the ACE score increased, the prevalence of CAMD increased in a graded fashion for both men and women ($p$ for trend <.0001). After adjustment for age, sex, race/ethnicity, and education, adults with an ACE score $\geq 6$ were 5.9 (95% CI, 4.4–7.9) times more likely to have CAMD compared to adults with an ACE score of 0. The prevalence of CAMD increased with each successive birth cohort, and graded relationships between the ACE score and CAMD were observed among each of the four birth cohorts though no statistical difference in the association was found across birth cohorts.

☆ The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the Centers for Disease Control and Prevention.

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**Conclusions:** The accumulation of ACEs across several domains is associated CAMD among men and women and in each of four birth cohorts. Further research is needed that describes the prevalence of CAMD in population-based samples and that examines whether impaired memory is a marker for persons neurobiologically affected by multiple forms of child maltreatment and related traumatic stressors.
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*Keywords:* Amnesia; Child abuse

## Introduction

A disturbance in autobiographical memory (Howe & Courage, 1993; Nelson & Fivush, 2004) related to childhood, or childhood autobiographical memory disturbance (CAMD), is a memory disruption characterized by the inability to remember events from childhood. Although identified by Freud nearly 100 years ago (Pillemer, 1998), CAMD remains poorly understood. Relationships between childhood physical and sexual abuse and deficits in short-term memory (Bremner et al., 1995) and CAMD (Edwards, Fivush, Anda, & Felitti, 2001) have been observed among adult survivors. However, associations of child maltreatment and related stressors and the accumulation of such stressors remains unclear.

Using data from the Adverse Childhood Experiences (ACE) Study, a collaborative effort between Kaiser Permanente (San Diego, CA) and the Centers for Disease Control and Prevention (Atlanta, GA), we examined (1) the relationship between CAMD and common forms of child maltreatment and related traumatic stressors (ACEs), and (2) the graded relationship between CAMD and the cumulative number of ACEs (ACE score) (i.e., the dose-response relationship) among 9,460 adults evaluated for wellness care at a southern California health maintenance organization. Finally, we examined whether relationships between the ACE score and the likelihood of CAMD were similar across generations (i.e., birth cohorts).

## Methods

The ACE Study methods are described elsewhere (Anda et al., 1999; Anda et al., 2006; Felitti et al., 1998), and the institutional review boards of Kaiser Permanente and the Office for Protection from Research Risks at the National Institutes of Health approved the study. Briefly, participants were drawn from the more than 50,000 adult members of the Kaiser Health Plan in San Diego who are evaluated annually at Kaiser's San Diego Health Appraisal Clinic; 81% of all adults within the San Diego Kaiser Health Plan attend the Health Appraisal Clinic at least once in any 4-year period (Felitti et al., 1998). As part of this annual examination, participants complete a standardized health history, psychosocial evaluations, and a physical examination. We mailed a questionnaire to total of 13,494 members who consecutively visited Kaiser's Health Appraisal Clinic and completed the standardized clinic evaluation between August 1995 and March 1996. The questionnaire covered childhood exposure to abuse, domestic violence, and other forms of serious and interrelated household dysfunction (Dong et al., 2004). A total of 9,508 (70%) members responded; information on race and educational attainment was incomplete for 48 persons, which left a total sample of 9,460 persons.

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