



Pergamon

Child Abuse  
& Neglect

Child Abuse & Neglect 27 (2003) 625–639

## The relationship of exposure to childhood sexual abuse to other forms of abuse, neglect, and household dysfunction during childhood<sup>☆</sup>

Maxia Dong<sup>a,\*</sup>, Robert F. Anda<sup>a</sup>, Shanta R. Dube<sup>a</sup>,  
Wayne H. Giles<sup>a</sup>, Vincent J. Felitti<sup>b</sup>

<sup>a</sup>*Division of Adult and Community Health, National Center for Chronic Disease Prevention and Health Promotion, Division of Adult and Community Health, Centers for Disease Control and Prevention, 4170 Buford Highway NE, MS K-67, Atlanta, GA 30341–3717, USA*

<sup>b</sup>*Department of Preventive Medicine, Southern California Permanente Medical Group, San Diego, CA, USA*

Received 27 February 2002; received in revised form 6 October 2002; accepted 6 October 2002

### Abstract

**Objective:** This study assesses the relationship of childhood sexual abuse (CSA) to nine other categories of Adverse Childhood Experiences (ACEs), including childhood abuse, neglect, and multiple types of household dysfunction.

**Methods:** Retrospective cohort study data were collected from 17,337 adult health plan members who responded to a survey questionnaire. Regression models adjusted for age, race, and education were used to estimate the strength of the association of CSA to each of the other nine ACEs and a graded relationship between measures of the severity of CSA and the number of other ACEs (ACE score).

**Results:** CSA was reported by 25% of women and 16% of men. In comparison with persons who were not exposed to CSA, the likelihood of experiencing each category of ACE increased 2- to 3.4-fold for women and 1.6- to 2.5-fold for men ( $p < .05$ ). The adjusted mean ACE score showed a significant positive graded relationship to the severity, duration, and frequency of CSA and an inverse relationship to age at first occurrence of CSA ( $p < .01$ ).

**Conclusions:** CSA is strongly associated with experiencing multiple other forms of ACEs. The strength of this association appears to increase as the measures of severity of the CSA increases. The

<sup>☆</sup> The Adverse Childhood Experiences Study was supported under a cooperative agreement #TS-44–10/11 from the Centers for Disease Control and Prevention through the Association of Teachers of Preventive Medicine and is currently funded by a grant from the Garfield Memorial Fund.

\* Corresponding author.

understanding of the interrelatedness of CSA with multiple ACEs should be considered in the design of studies, treatment, and programs to prevent CSA as well as other forms of ACEs.

© 2003 Elsevier Science Ltd. All rights reserved.

*Keywords:* Child abuse; Sexual; Child neglect; Household dysfunction

---

## Introduction

Childhood sexual abuse (CSA) is a major public health concern because it increases the risk of a wide range of subsequent behavior problems, mental health disorders and adjustment difficulties in childhood as well as the serious long-term sequelae in adult life. Although most CSA goes unreported (Leventhal, 1998; Smith et al., 2000), in 1997, about 130,000 children were identified as victims of substantiated CSA (US Department of Health and Human Services, 1999). In the last two decades, epidemiologic studies of CSA and its adverse effects on human health have received broad attention (Beitchman et al., 1992; Bensley, van Enwyk, & Simmons, 2000; Finkelhor, Hotaling, Lewis, & Smith, 1990; Fleming, Mullen, Sibthorpe, & Bammer, 1999; Leventhal, 1998; Molnar, Buka, & Kessler, 2001; Neumann, Houskamp, Pollock, & Briere, 1996).

Most CSA studies have focused on the CSA experience alone. In the 1980s, however, Finkelhor and his colleagues pointed out that it is possible that the long-term effects of CSA are not solely a function of the sexual abuse but include other pathological elements, such as psychological abuse, neglect, or family disorganization (Finkelhor, Araji, Baron, Peter, & Wyatt, 1986). Thus, simplistic, single-factor approaches to predicting abuse (including CSA) and neglect are incorrect because they do not address the complicity of the events and their multiple determinants and modifiers (Sedlak, 1997).

In the past decade, an increasing number of studies has reported that children exposed to CSA were also physically and emotionally abused (Fergusson & Mullen, 1999; Finkelhor & Dziuba-Leatherman, 1994; Fleming, Mullen, & Bammer, 1997; Madu & Peltzer, 2000; Mullen, Martin, Anderson, Romans, & Herbison, 1996). In addition, psychological disorders and other complicating problems in adulthood have been linked to CSA (Beitchman et al., 1992; Davis & Petretic-Jackson, 2000; Fleming et al., 1999; Molnar et al., 2001; Mullen et al., 1996; Neumann et al., 1996).

In a study of the impact of CSA on its victims, Burkhart and Fromuth (1996) found an association of CSA with other forms of interpersonal violence in adulthood. Children who have been neglected, have a parent with a problem of alcohol abuse, or have a battered mother have been reported to be at significantly increased risk of CSA (Dube, Anda, Felitti, Croft, et al., 2001; Finkelhor, Moore, Hamby, & Straus, 1997; Fleming et al., 1999; Vogeltanz et al., 1999).

Previous reports from the Adverse Childhood Experiences (ACE) Study are consistent with the assertion of Finkelhor et al. (1986) that the effects of CSA need to be considered in concert with other traumatic or developmentally disabling exposures. Such Adverse Childhood Experiences (ACE) are a complex set of highly interrelated experiences (Anda et al., 1999; Felitti et al., 1998). In fact, where multiple ACEs were considered, strong graded relationships to

many health-related problems, such as smoking, adult alcohol problems, unintended pregnancies, sexually transmitted diseases, and suicide attempts, as well as to leading causes of death in the United States have been reported (Anda et al., 1999; Dietz et al., 1999; Dube, Anda, Felitti, Chapman, et al., 2001; Dube, Anda, Felitti, Croft, et al., 2001; Dube, Anda, Felitti, Edwards, & Croft, 2002; Felitti et al., 1998; Hillis, Anda, Felitti, Nordenberg, & Marchbanks, 2000).

In this paper, we used data from the ACE Study to provide a detailed description of the relationship between CSA and nine other forms of ACEs. Specifically, we quantified the strength of the associations between CSA and exposure to childhood emotional or physical abuse, emotional or physical neglect, and multiple forms of household dysfunction, including having a battered mother, substance abusing, mentally ill, or criminal household members, and parental separation or divorce. In addition, we tested for a graded relationship between characteristics that may indicate the severity of the CSA (type of sexual contact, perpetrators' relationship, frequency and duration of CSA) and the number of other ACEs. We assessed these interrelationships to identify factors that may contribute to the apparent negative long-term effects of growing up with CSA, and to highlight circumstances that may increase the likelihood of experiencing multiple ACEs which may provide directions for the development of prevention and intervention strategies.

## Methods

The data were collected as a portion of the ACE Study, a collaboration between Kaiser Permanente (San Diego, CA) and the Centers for Disease Control and Prevention, Atlanta, Georgia. The overall objective of this study is to evaluate the association of numerous, interrelated ACEs to a wide variety of health behaviors and health conditions that are of national importance. A more complete description of methods for the ACE Study has been published elsewhere (Felitti et al., 1998). The study was approved by the institutional review boards of Kaiser Permanente, and the Office of Protection from Research Risks at the National Institutes of Health. Potential participants received letters that accompanied the ACE study questionnaire, informing them that their participation was voluntary, and their answers would be held in strictest confidence, and would never become part of their medical records.

### *Study sample selection and data collection*

The study population included adult members of the Kaiser Health Plan who received a standardized medical and biopsychosocial examination at Kaiser's Health Appraisal Center in San Diego, CA. Kaiser is a large health maintenance organization (HMO) whose subscribers represent a broad range of the general population. Each year more than 50,000 members receive such an examination, and in any 4-year period, 81% of adult members have received it. The ACE study consisted of two survey waves (Wave I and Wave II). The sample for Wave I was drawn from 13,494 members who received an evaluation at the Health Appraisal Center between August 1995 and March 1996; the Wave II sample was drawn from

13,330 members who received their evaluations between June and October 1997. The primary purpose of the evaluation is to perform a complete health assessment rather than provide symptom- or illness-based care. The response rate was 70% ( $n = 9,508$ ) for Wave I and 65% ( $n = 8,667$ ) for Wave II, which resulted in an overall response rate of 68% (18,175/26,824).

The ACE questionnaire was mailed to members two weeks after their evaluation and contained detailed questions about childhood abuse (sexual, emotional or physical), neglect (emotional or physical), growing up with family and household dysfunction (domestic violence, parental separation or divorce, mental illness, substance abuse, or crime) as well as information about health-related behaviors from adolescence to adulthood. The Wave II questionnaire added questions about emotional and physical neglect and to obtain more thorough information about health topics shown to be important during the analysis of Wave I data (Dietz et al., 1999; Felitti et al., 1998).

#### *Assessment of representativeness, and response or reporting bias*

As part of the Wave I study design, the standardized health examination data were abstracted for both respondents and nonrespondents to the ACE Study questionnaire; this enable a detailed assessment of the study population in terms of possible bias in demographic characteristics and health-related issues (Edwards et al., 2001). Although nonrespondents tended to be younger, less educated, or from racial/ethnic minority groups, the probabilities of both psychosocial and health problems were remarkably similar between respondents and nonrespondents after controlling for demographic differences.

In addition, assessment of the strength of the relationships between CSA and numerous health behaviors, diseases, and psychosocial problems showed that their strength was virtually identical for respondents and nonrespondents (Edwards et al., 2001). Thus, there was no evidence that respondents were biased toward attributing their health problems to childhood experiences such as sexual abuse (Edwards et al., 2001).

#### *Definition of childhood sexual abuse*

CSA was assessed using four questions adapted from Wyatt (1985) that assessed the progression in severity of sexual contact from fondling to attempted and completed penetration. The subjects were asked whether an adult, relative, family friend, or stranger who was at least 5 years older than themselves had ever (1) touched or fondled their body in a sexual way, (2) had them touch his/her body in a sexual way, (3) attempted to have any type of sexual intercourse with them (oral, anal, or vaginal), or (4) actually had any type of sexual intercourse with them (oral, anal, or vaginal). Subjects were classified as sexually abused during childhood if they responded affirmatively to any one of these four questions and were 18 years of age or younger when the abuse occurred.

For each of the four questions about CSA, persons who responded yes were asked to provide further information, including age at the first occurrence of the abuse, the number of times it occurred, the relationship of the perpetrator to the respondent, and whether force or coercion was employed.

### Definitions of other forms of ACEs

All questions about ACEs referred to the respondents' first 18 years of life. To assess emotional and physical neglect we used the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994), which is scored on a Likert scale (1–5) (response categories of *never true*, *rarely true*, *sometimes true*, *often true* and *very often true*). Some items from the CTQ were reverse-scored to reflect the framing of the question (Bernstein et al., 1994). Questions used to define emotional and physical abuse and growing up with a battered mother were adapted from the Conflict Tactics Scale (CTS; Straus & Gelles, 1990) with the response categories of *never*, *once or twice*, *sometimes*, *often*, or *very often*.

*Emotional abuse.* Participant were defined as being emotionally abused during childhood if they responded *often* or *very often* to either of the following two questions: “How often did a parent, stepparent, or adult living in your home swear at you, insult you, or put you down?” and “How often did a parent, stepparent, or adult living in your home act in a way that made you afraid that you might be physically hurt?”

*Physical abuse.* Two questions were used to ascertain childhood physical abuse: “Sometimes parents or other adults hurt children. While you were growing up, that is, in your first 18 years of life, how often did a parent, stepparent, or adult living in your home (1) push, grab, slap, or throw something at you? or (2) hit you so hard that you had marks or were injured?” A respondent was defined as being physically abused if the response was either *often* or *very often* to the first question or *sometimes*, *often*, or *very often* to the second.

*Emotional neglect.* To measure emotional neglect, five questions were used: (1) “There was someone in my family who helped me feel important or special.” (2) “I felt loved.” (3) “People in my family looked out for each other.” (4) “People in my family felt close to each other.” (5) “My family was a source of strength and support.” For each respondent all responses were reverse-scored and summed to determine the CTQ clinical scales. A respondent with a score of  $\geq 15$  (moderate to extreme) was defined as having experienced emotional neglect. This information was available only in Wave II data.

*Physical neglect.* To determine physical neglect, response to five statements were requested: (1) “I didn't have enough to eat.” (2) “I knew there was someone there to take care of me and protect me.” (3) “My parents were too drunk or too high to take care of me.” (4) “I had to wear dirty clothes.” (5) “There was someone to take me to the doctor if I needed it.” Responses to all five items were scored and summed for each respondent. Questions 2 and 5 were reverse-scored. A respondent with a score of  $\geq 10$  (moderate to extreme) was defined as having experienced physical neglect. This information was collected only in survey Wave II.

*Battered mother.* We used four questions from the CTS to consider childhood exposure to a battered mother, all of them preceded by the following statement: “Sometimes physical blows occur between parents. While you were growing up in your first 18 years of life, how often did your father (or stepfather) or mother's boyfriend do any of these things to your mother (or

stepmother): (1) push, grab, slap, or throw something at her, (2) kick, bite, hit her with a fist, or hit her with something hard, (3) repeatedly hit her for at least a few minutes, or (4) threaten her with a knife or gun, or use a knife or gun to hurt her?" A response of *sometimes*, *often*, or *very often* to at least one of the first two questions or any response other than *never* to at least one of the third and fourth questions defined a respondent as having had a battered mother.

*Household substance abuse.* Two questions were used to determine whether respondents, during their childhood, lived with a problem drinker or alcoholic (Schoenborn, 1991) or anyone who used street drugs.

*Mental illness in household.* A respondent was defined as being exposed to mental illness if anyone in the household was depressed or mentally ill or had attempted suicide during the respondent's childhood.

*Parental separation or divorce.* This adverse experience was defined as an affirmative response to the question "Were your parents ever separated or divorced?"

*Criminal household member.* The respondent was defined as having childhood exposure to a criminal household member if anyone in the household had gone to prison during the respondent's childhood.

#### *Exclusions from the study cohort*

Given the many thousands of persons seen at the Health Appraisal Center, it was inevitable that some respondents underwent examinations during both waves ( $n = 754$ ). Thus, the unduplicated number of respondents was 17,421. After the exclusion of 17 respondents due to missing information about race and 67 due to missing information about education, the final study sample included 95% of the respondents (17,337/18,175); (Wave I = 8,708, Wave II = 8,629).

#### *Statistical analysis*

Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) were obtained from multivariate logistic regression models that estimated the associations between CSA and each of the other nine categories of ACE. The ACE score was calculated by summing the number of ACEs (except CSA) reported for each respondent (range: 0–9). Adjusted mean ACE scores by indicators of severity of CSA were obtained using a multiple linear regression. Covariates in all models included age at time of the study, sex, race (other vs. White), and education (high school diploma, some college, or college graduate vs. less than high school).

Persons with incomplete information about an ACE ( $n = 172$ ; 1% of respondents) were considered not to have had that experience. Theoretically, this exclusion would result in conservative estimates of the relationships between CSA and ACEs, because persons who had potentially been exposed to an experience would always be misclassified as unexposed. To assess this potential effect, we repeated our analyses after excluding any respondent

with missing information on any one of the ACEs but found no differences in the final results.

## Results

### *Characteristics of the study population*

The study population included 9,367 (54%) women and 7,970 (46%) men. The mean age ( $\pm$  standard deviation) was 55 ( $\pm$  15.7) years for women and 57 ( $\pm$  14.6) years for men (data not shown). Percentage for women and men for other variables were white race, 73% and 76%; college graduate, 35% and 45%; some college education, 37% and 34%; and not a high school graduate, 8% and 6%.

### *Prevalence and characteristics of CSA*

Overall, 21% of respondents reported being sexually abused during their childhood (25% of women and 16% of men) (Table 1). By each categories of ACE, women had a higher prevalence than men for all but physical abuse and physical neglect (Table 1).

The mean age (in years,  $\pm$  standard deviation) at the onset of sexual abuse was 10.2 ( $\pm$  4.2), with the age of onset for female victims younger (9.3  $\pm$  3.9 years) than for males (11.3  $\pm$  3.9 years). Among 1,523 CSA victims who responded to the question about their relationship with the perpetrator, 34% described the perpetrator as someone (a relative or non-relative) who lived in their home.

Table 1  
Prevalence of childhood sexual abuse and other adverse childhood experiences by gender

Category of ACE	Prevalence (%)		
	Women ( <i>n</i> = 9,367)	Men ( <i>n</i> = 7,970)	Total ( <i>n</i> = 17,737)
Childhood sexual abuse	24.7	16.0	20.7
Other adverse childhood experiences			
Abuse			
Emotional abuse	13.1	7.6	10.6
Physical abuse	27.0	29.9	28.3
Household dysfunction			
Battered mother	13.7	11.5	12.7
Parental separation or divorce	24.5	21.8	23.3
Mental illness in household	23.3	14.8	19.8
Household substance abuse	29.5	23.8	26.9
Criminal household member	5.1	4.1	4.7
Neglect <sup>a</sup>	( <i>n</i> = 4,674)	( <i>n</i> = 3,955)	( <i>n</i> = 8,629)
Emotional neglect	16.7	12.5	14.8
Physical neglect	9.2	10.8	9.9

<sup>a</sup>Data about neglect were available for the ACE Study Wave II survey only.

Table 2

Prevalence and adjusted odds ratio for each adverse childhood experience by history of childhood sexual abuse, stratified by gender

Category of ACE (dependent variable)	Childhood sexual abuse	Women ( <i>n</i> = 9,367)		Men ( <i>n</i> = 7,970)	
		%	Adjusted odds ratio (95% CI) <sup>a,*</sup>	%	Adjusted odds ratio (95% CI) <sup>a,*</sup>
Emotional abuse	No	8.8	1.0 (Referent)	6.3	1.0 (Referent)
	Yes	26.1	3.4 (3.0–3.8)	14.3	2.5 (2.1–3.0)
Physical abuse	No	21.0	1.0 (Referent)	27.4	1.0 (Referent)
	Yes	45.5	3.0 (2.7–3.3)	42.7	2.0 (1.7–2.2)
Battered mother	No	10.4	1.0 (Referent)	9.8	1.0 (Referent)
	Yes	23.6	2.6 (2.3–2.9)	20.5	2.3 (2.0–2.7)
Household substance abuse	No	24.9	1.0 (Referent)	21.8	1.0 (Referent)
	Yes	43.4	2.1(1.9–2.3)	34.3	1.9 (1.7–2.2)
Household mental illness	No	18.8	1.0 (Referent)	13.3	1.0 (Referent)
	Yes	37.0	2.3 (2.1–2.6)	22.5	1.9 (1.7–2.3)
Parental separation/divorce	No	20.7	1.0 (Referent)	19.6	1.0 (Referent)
	Yes	35.9	2.0 (1.8–2.2)	33.2	2.0 (1.8–2.3)
Criminal household member	No	3.6	1.0 (Referent)	3.7	1.0 (Referent)
	Yes	9.9	2.3 (2.3–3.3)	6.2	1.6 (1.3–2.1)
Emotional neglect <sup>b</sup>	No	12.6	1.0 (Referent)	11.0	1.0 (Referent)
	Yes	29.6	2.8 (2.4–3.3)	19.9	2.0 (1.6–2.5)
Physical neglect <sup>b</sup>	No	6.8	1.0 (Referent)	9.4	1.0 (Referent)
	Yes	16.6	2.9 (2.3–3.5)	17.3	2.1(1.6–2.6)

<sup>a</sup> In a logistic model adjusting for age at survey, race, and educational attainment.

<sup>b</sup> ACE Survey Wave II data only, which included 4,674 women and 3,955 men.

\*  $p < .05$ .

### CSA and the likelihood of other types of ACEs

We found strong relationships between CSA and each of the other nine ACEs. Overall, for each category, the presence of CSA increased the likelihood of experiencing the ACE significantly, with ORs of 2.0 to 3.4 for women and 1.6 to 2.5 for men (Table 2). The association was highest for emotional abuse, with physical abuse, physical neglect, and having a battered mother during childhood also having strong associations (Table 2).

### CSA and the ACE score

Because the prevalence of the ACE Score is not substantially different for men and women (Dube et al., 2001), we present the distribution of unadjusted ACE scores for men and women combined. As revealed in Figure 1, the distribution of the ACE score differed remarkably by



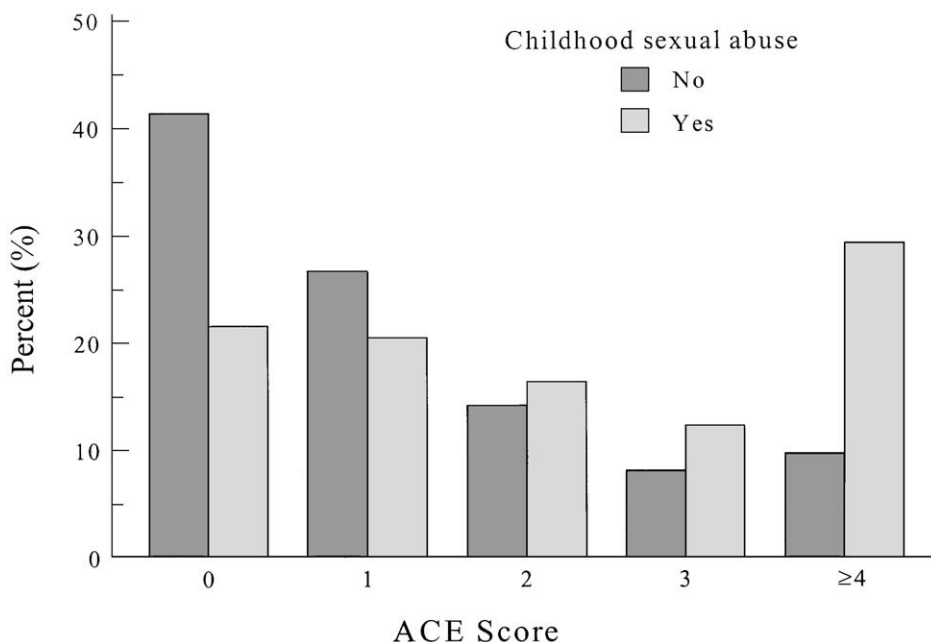


Figure 1. Distribution of ACE score by history of childhood sexual abuse for participants in Wave II.

a history of CSA. The prevalence of 0 ACEs was 22% for respondents who had CSA versus 41% for those who had not; the prevalence of  $\geq 4$  ACEs was 29% and 10% for persons who had experienced and who had not experienced CSA, respectively (Figure 1).

The adjusted mean ACE scores for persons who had and had not experienced CSA were 2.5 and 1.3, respectively ( $p < .0001$ ). We also found a statistically significant graded relationship between the indicators of the severity of CSA and the adjusted mean ACE score ( $p < .01$ ) for all indicators of severity (Table 3). This graded relationship did not differ for men and women.

## Discussion

Our findings suggest that CSA rarely occurs as an isolated event and clearly overlaps with other types of negative childhood experiences. In our study, CSA was significantly associated with experiencing each of the other nine ACEs. Our findings support and expand on previous studies that have reported associations between CSA and other types of childhood abuse, neglect, and household dysfunction.

We found that the likelihood of enduring multiple ACEs, as demonstrated by having a high ACE score, is considerably elevated among persons who reported CSA. Thus, children who are sexually abused are more likely to experience various forms of abuse, neglect, and household dysfunction. The common co-occurrence of CSA and other ACEs is important because the negative short- and long-term influences of ACEs on behaviors, emotional and social well-being and physical health have repeatedly been shown to be cumulative (Anda

Table 3  
Crude and adjusted means of ACE score by severity of childhood sexual abuse for participants in Wave II

Severity of childhood sexual abuse ( <i>N</i> = 8,629)	%	ACE score		
		Crude mean	Adjusted mean <sup>a</sup>	<i>SE</i>
No sexual abuse	79.0	1.3	1.3	.02
Fondling only	12.6	2.2	2.2	.05
Attempted intercourse	2.4	3.0	2.8	.11
Completed intercourse	6.0	2.8	2.7	.07
Age at onset of sexual abuse (years)				
No sexual abuse	82.2	1.3	1.3	.01
12–17	5.7	2.2	2.2	.08
< 12	12.1	2.8	2.7	.05
Severity by age group (years)				
No sexual abuse	82.0	1.3	1.3	.02
Fondling only				
12–17	2.9	2.0	2.0	.11
< 12	7.5	2.5	2.4	.07
Attempted/completed intercourse				
12–17	3.5	2.7	2.6	.10
< 12	4.0	3.2	3.0	.09
Number of times of sexual abuse experienced				
0	82.8	1.3	1.3	.02
1	5.3	2.1	2.1	.08
2–4	6.0	2.4	2.4	.07
≥ 5	5.9	3.0	2.8	.08
Number of perpetrators				
0	81.1	1.3	1.3	.02
1	13.3	2.4	2.3	.05
2	3.4	2.8	2.7	.10
≥ 3	2.3	3.6	3.4	.12
Duration of abuse (years)				
No sexual abuse	82.6	1.3	1.3	.02
Fondling only				
< 3	8.3	2.2	2.2	.07
≥ 3	1.8	2.9	2.8	.13
Attempted/completed intercourse				
< 3	5.7	2.9	2.8	.08
≥ 3	1.5	3.4	3.2	.15
Perpetrators' relationship				
No sexual abuse	81.9	1.3	1.3	.02
Stranger/relative/caretaker who did not live at home	12.0	2.2	2.2	.05
Relative/non-relative who lived at home	6.2	3.4	3.3	.07
Coercion or violence by perpetrator				
No sexual abuse	79.0	1.3	1.2	.02
Abused, no coercion	9.2	1.9	1.9	.06
Abused with trick or given alcohol or drugs	6.3	2.5	2.4	.07
Threatened with harm, or physical force used	5.5	3.4	3.2	.08

<sup>a</sup> The trend for increasing mean ACE scores was statistically significant ( $p < .01$ ) for every measure of severity of sexual abuse based upon multiple linear regression adjusted for age, race, sex, and educational attainment.

et al., 1999; Dietz et al., 1999; Dube, Anda, Felitti, Chapman, et al., 2001; Dube et al., 2002; Felitti et al., 1998; Hillis et al., 2000).

Biological plausibility of the reported effects of childhood experiences is supported by recent findings from the neurosciences suggesting that early life experiences, whether negative or positive, contribute to the neurological development of children. Specifically, child abuse, neglect and other stressors can adversely affect the developing brain in ways that result in emotional, social, and cognitive impairments, increasing the risk for substance abuse, depression, suicide, and a variety of other problems (Bensley et al., 2000; DeBellis et al., 1999; Perry, Pollard, Blakely, Baker, & Vigilante, 1995; van der Kolk & Fisler, 1994).

In the present study, we found that CSA is more likely to occur in children younger than 12 years of age. Victims who are age 9 or 10 (our average age of onset for female was 9.3 years) are unequivocally children, not young women. Hence, further study of when ACEs occur, such as early age at onset of sexual abuse in childhood and their relation with health outcomes in adulthood, may help to clarify how the central nervous system is affected by these exposures at various developmental stages.

We found a strong dose-response relationship between the severity of CSA and the mean ACE score. Adults who reported multiple occurrences of CSA, more severe CSA, or multiple and intrafamilial perpetrators were more likely to have experienced multiple ACEs. Multiple ACEs are indicative of a disordered social environment and social ecology in which children are not adequately protected against such incidents (Fleming et al., 1999). This may also explain why CSA victims who reported earlier age of onset, longer duration, and higher levels of physical intrusion were more likely to report multiple other forms of ACEs. Thus, additional factors such as the severity of CSA and co-occurring ACEs should be considered in future studies of the effects of CSA.

Because severity of CSA has been reported to be strongly related to long-term disorders (Johnson, Pike, & Chard, 2001), negative sequelae of CSA may be more common or more severe because the burden of ACEs intensifies with increasing severity of CSA. For example, a child who is coping with an existing problematic family background or emotional abuse, may be more vulnerable to the additional trauma of CSA. In fact, this may help to explain the graded relationship between the number of ACEs and health-risk behaviors in adulthood, previously shown from the ACE Study (Anda et al., 1999; Dube et al., 2002; Felitti et al., 1998).

Practitioners who treat sexually abused children should be aware that the families of these victims need assessment for child abuse and neglect, and forms of household dysfunction. This approach could unite what are traditionally considered categorically different health and social disciplines. Specifically, improved coordination of adult and pediatric health care and related social and legal services may lead to earlier recognition, treatment and prevention of CSA and numerous other types of ACEs.

A potential weakness of the present study is the retrospective reporting of childhood experiences. Longitudinal follow-up of adults who suffered well-documented CSA, however, has shown that their retrospective reports of childhood abuse are likely to underestimate actual occurrence (Della Femina, Yeager, & Lewis, 1990; Williams, 1995). Other issues that may result in underreporting are the sensitive or socially “taboo” nature of the experiences and memory impairments that can be a consequence of these exposures (Fish & Scott, 1999; Shin et al., 1999; Smith et al., 2000). Thus, both CSA and the other ACEs we studied are prone to

underreporting. If both the exposure (CSA) and the outcome (other ACEs) are underreported, results become biased towards the null (Rothman, 1986). Thus, the relationships between CSA and other ACEs that we report probably underestimate their true strength.

It is possible there is differential recall, depending upon the nature and significance of the events (e.g., sexual abuse compared with emotional neglect). Despite the debate that problems in adult life, which stimulate a focus on the negative aspects of childhood, would increase the reporting of CSA or other ACEs, our study setting was based on a general population, and the data were collected from HMO members receiving a health evaluation. This approach could serve to clarify some aspects on recall experience.

Another potential limitation is uncertainty about the temporal sequence of experiences that we studied. We do not intend to infer that CSA causes the occurrence of other ACEs. Rather, our findings support our assertion that regardless of the temporal sequence of events, when examining CSA, other forms of abuse, neglect, and household dysfunction must be considered.

Our estimates of the prevalence of childhood exposures are similar to estimates from large population based surveys (Finkelhor, 1994; Wyatt, Lobe, Solis, Carmona, & Romero, 1999), indicating that the experiences of our participants are comparable to the larger population of adults. For example, in our study we found that 16% of the men and 25% of the women met the case definition for contact sexual abuse; a national telephone survey of adults in US conducted by Finkelhor et al. (1990) using similar criteria for sexual abuse estimated that 16% of men and 27% of women had been sexually abused. Of the men from our study, 28% had been physically abused as boys, which closely parallels the percentage (31%) found in a recent population-based study of Ontario men in Canada that used questions from the same scales (MacMillan et al., 1997). The similarity in estimates of the prevalence of these childhood exposures between the ACE Study and other population-based studies suggests that our findings are likely to be applicable in other settings.

In summary, adults who reported CSA were far more likely to have suffered multiple other adverse experiences during childhood. Thus, the tendency to focus on CSA alone in research studies about the effects of abuse clearly needs to move in the direction of assessing the other experiences that commonly co-occur with CSA. This is important to consider when identifying and treating children exposed to sexual abuse. Alternatively, children who have been identified as being exposed to abuse, neglect, or household dysfunction must also be screened for possible sexual abuse. The strength of the relationships we report and the dose-response relationship between exposure to CSA and the number of ACEs further underscores this need. The common co-occurrence of CSA with other adverse experiences and the cumulative negative impact of multiple ACEs have important implications for the development of health, social and legal systems which address the needs of CSA survivors for therapy, support and redress their victimization.

## References

- Anda, R. F., Croft, J. B., Felitti, V. J., Nordenberg, D., Giles, W. H., Williamson, D. F., & Giovino, G. A. (1999). Adverse childhood experiences and smoking during adolescence and adulthood. *Journal of the American Medical Association*, 282, 1652–1658.

- Beitchman, J. H., Zucker, K. J., Hood, J. E., DaCosta, G. A., Akman, D., & Cassavia, E. (1992). A review of the long-term effects of child sexual abuse. *Child Abuse & Neglect*, *16*, 101–118.
- Bensley, L. S., van Eenwyk, J., & Simmons, K. W. (2000). Self-reported childhood sexual and physical abuse and adult HIV-risk behaviors and heavy drinking. *American Journal of Preventive Medicine*, *18*, 151–158.
- Bernstein, D. P., Fink, L., Handelsman, L., Foote, J., Lovejoy, M., Wenzel, K., Sapereto, E., & Ruggiero, J. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *American Journal of Psychiatry*, *151*, 1132–1136.
- Burkhart, B. R., & Fromuth, M. E. (1996). The victim: Issues in identification and treatment. In T. L. Jackson (Ed.), *Acquaintance rape: Assessment, treatment and prevention* (pp. 145–176). Sarasota, FL: Professional Resources Press.
- Davis, J. L., & Petretic-Jackson, P. A. (2000). The impact of child sexual abuse on adult interpersonal functioning: A review and synthesis of the empirical literature. *Aggression and Violent Behavior*, *5*, 291–328.
- DeBellis, M. D., Baum, A. S., Birmaher, B., Keshavan, M. S., Eccard, C. H., Boring, A. M., Jenkins, F. J., & Ryan, N. D. (1999). A. E. Bennett research award. Developmental traumatology. Part I: Biological stress systems. *Society of Biological Psychiatry*, *45*, 1259–1270.
- Della Femina, D., Yeager, C. A., & Lewis, D. O. (1990). Child abuse: Adolescent records vs. adult recall. *Child Abuse & Neglect*, *14*, 227–231.
- Dietz, P. M., Spitz, A. M., Anda, R. F., Williamson, D. F., McMahon, P. M., Santelli, J. S., Nordenberg, D. F., Felitti, V. J., & Kendrick, J. S. (1999). Unintended pregnancy among adult women exposed to abuse or household dysfunction during their childhood. *Journal of the American Medical Association*, *282*, 1359–1364.
- Dube, S. R., Anda, R. F., Felitti, V. J., Chapman, D. P., Williamson, D. F., & Giles, W. H. (2001). Childhood abuse, household dysfunction and the risk of attempted suicide throughout the life span: Findings from the adverse childhood experiences study. *Journal of the American Medical Association*, *286*, 3089–3096.
- Dube, S. R., Anda, R. F., Felitti, V. J., Croft, J. B., Edwards, V. J., & Giles, W. H. (2001). Growing up with parental alcohol abuse: Exposure to childhood abuse, neglect and household dysfunction. *Child Abuse & Neglect*, *25*, 1627–1640.
- Dube, S. R., Anda, R. F., Felitti, V. J., Edwards, V. J., & Croft, J. B. (2002). Adverse childhood experiences and personal alcohol abuse as an adult. *Addictive Behaviors*, *27*, 713–725.
- Edwards, V. J., Anda, R. F., Nordenberg, D. F., Felitti, V. J., Williamson, D. F., & Wright, J. A. (2001). Bias assessment for child abuse survey: Factors affecting probability of response to a survey about childhood abuse. *Child Abuse & Neglect*, *25*, 307–312.
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The adverse childhood experience (ACE) study. *American Journal of Preventive Medicine*, *14*, 245–258.
- Fergusson D. M., & Mullen P. E. (1999). Childhood sexual abuse: An evidence-based perspective. *Developmental clinical psychiatry* (Vol. 40). Thousand Oaks, CA: Sage.
- Finkelhor, D. (1994). The international epidemiology of child sexual abuse. *Child Abuse & Neglect*, *18*, 409–417.
- Finkelhor, D., Araji, S., Baron, L., Peter, S. D., & Wyatt G. E. (1986). *A source book on child sexual abuse*. Thousand Oaks, CA: Sage.
- Finkelhor, D., & Dziuba-Leatherman, J. (1994). Children as victims of violence: A national survey. *Pediatrics*, *94*(4 Pt 1), 413–420.
- Finkelhor, D., Hotaling, G., Lewis, I. A., & Smith, C. (1990). Sexual abuse in a national survey of adult men and women: Prevalence, characteristics, and risk factors. *Child Abuse & Neglect*, *14*, 19–28.
- Finkelhor, D., Moore, D., Hamby, S. L., & Straus, M. A. (1997). Sexually abused children in a national survey of parents: Methodological issues. *Child Abuse & Neglect*, *21*, 1–9.
- Fish, V., & Scott, C. G. (1999). Childhood abuse recollections in a nonclinical population: Forgetting and secrecy. *Child Abuse & Neglect*, *23*, 791–802.
- Fleming, J., Mullen, P., & Bammer, G. (1997). A study of potential risk factors for sexual abuse in childhood. *Child Abuse & Neglect*, *21*, 45–58.
- Fleming, J., Mullen, P. E., Sibthorpe, B., & Bammer, G. (1999). The long-term impact of childhood sexual abuse in Australian women. *Child Abuse & Neglect*, *23*, 145–159.

- Hillis, S. D., Anda, R. F., Felitti, V. J., Nordenberg, D., & Marchbanks, P. A. (2000). Adverse childhood experiences and sexually transmitted diseases in men and women: A retrospective study. *Pediatrics*, *106*, E11.
- Johnson, D. M., Pike, J. L., & Chard, K. M. (2001). Factors predicting PTSD, depression, and dissociative severity in female treatment-seeking childhood sexual abuse survivors. *Child Abuse & Neglect*, *25*, 179–198.
- Leventhal, J. M. (1998). Epidemiology of sexual abuse of children: Old problems, new directions. *Child Abuse & Neglect*, *22*, 481–491.
- MacMillan, H. L., Fleming, J. E., Trocme, N., Boyle, M. H., Wong, M., Racine, Y. A., Beardslee, W. R., & Offord, D. R. (1997). Prevalence of child physical and sexual abuse in the community results from the Ontario health supplement. *Journal of the American Medical Association*, *278*, 131–135.
- Madu, S. N., & Peltzer, K. (2000). Risk factors and child sexual abuse among secondary school students in the Northern Province (South Africa). *Child Abuse & Neglect*, *24*, 259–268.
- Molnar, B. E., Buka, S. L., & Kessler, R. C. (2001). Child sexual abuse and subsequent psychopathology: Results from the national comorbidity survey. *American Journal of Public Health*, *91*, 753–760.
- Mullen, P. E., Martin, J. L., Anderson, J. C., Romans, S. E., & Herbison, G. P. (1996). The long-term impact of the physical, emotional, and sexual abuse of children. A community study. *Child Abuse & Neglect*, *20*, 7–21.
- Neumann, D. A., Houskamp, B. M., Pollock, V. E., & Briere, J. (1996). The long-term sequelae of childhood sexual abuse in women: A meta-analytic review. *Child Maltreatment*, *1*, 6–16.
- Perry, B. D., Pollard, R. A., Blakely, T. L., Baker, W. L., & Vigilante, D. (1995). Childhood trauma, the neurobiology of adaptation and use-dependent development of the brain: How states become traits. *Infant Mental Health Journal*, *16*, 271–291.
- Rothman, K. J. (1986). *Modern epidemiology*. Boston: Little, Brown.
- Schoenborn, C. A. (1991). Exposure to alcoholism in the family: United States, 1988. *Advance Data from Vital and Health Statistics*, *205*, 1–13.
- Sedlak, A. J. (1997). Risk factors for the occurrence of child abuse and neglect. *Journal of Aggression, Maltreatment & Trauma*, *1*, 149–187.
- Shin, L. M., McNally, R. J., Kosslyn, S. M., Thompson, W. L., Rauch, S. L., Alpert, N. M., Metzger, L. J., Lasko, N. B., Orr, S. P., & Pitman, R. K. (1999). Regional cerebral blood flow during script-driven imagery in childhood sexual abuse-related PTSD: A PET investigation. *American Journal of Psychiatry*, *156*, 575–584.
- Smith, D. W., Letourneau, E. J., Saunders, B. E., Kilpatrick, D. G., Resnick, H. S., & Best, C. L. (2000). Delay in disclosure of childhood rape: Results from a national survey. *Child Abuse & Neglect*, *24*, 273–287.
- Straus, M., & Gelles, R. J. (1990). *Physical violence in American families: Risk factors and adaptations to violence in 8,145 families*. New Brunswick, NJ: Transaction Press.
- US Department of Health and Human Services. (1999). *Child maltreatment 1997: Reports from the States to the National Child Abuse and Neglect Data System*. Washington, DC: US Government Printing Office.
- van der Kolk, B. A., & Fisler, R. E. (1994). Childhood abuse and neglect and loss of self-regulation. *Bulletin of the Menninger Clinic*, *58*, 145–168.
- Vogeltanz, N. D., Wilsnack, S. C., Harris, T. R., Wilsnack, R. W., Wonderlich, S. A., & Kristjanson, A. F. (1999). Prevalence and risk factors for childhood sexual abuse in women: National survey findings. *Child Abuse & Neglect*, *23*, 579–592.
- Williams, L. M. (1995). Recovered memories of abuse in women with documented child sexual victimization histories. *Journal of Traumatic Stress*, *8*, 649–673.
- Wyatt, G. E. (1985). The sexual abuse of Afro-American and White-American women in childhood. *Child Abuse & Neglect*, *9*, 507–519.
- Wyatt, G. E., Lobe, T. B., Solis, B., Carmona, J. V., & Romero, G. (1999). The prevalence and circumstances of child sexual abuse: Changes across a decade. *Child Abuse & Neglect*, *23*, 45–60.

## Résumé

**Objectif:** Cette étude examine la relation entre les agressions sexuelles des enfants et neuf autres types d'expériences nocives en enfance, y compris les mauvais traitements, la négligence et une gamme de problèmes familiaux.

**Méthode:** On a recueilli des données rétrospectives sur 17.337 membres d'un programme d'assurance santé, à qui on a administré un questionnaire. Des modèles de régression ont servi à juger de l'importance des liens entre les agressions sexuelles et chacun des neuf facteurs, puis on a utilisé une cote graduée pour mesurer la gravité des agressions et le nombre d'autres expériences nocives.

**Résultats:** Vingt-cinq pour cent des femmes et seize pour cent des hommes déclarent avoir été victimes d'agressions sexuelles. Lorsqu'on les compare à des personnes qui n'ont pas été agressées, la probabilité que ces victimes connaîtront aussi d'autres expériences nocives augmente de 2 à 3,4 fois pour les femmes et de 1,6 à 2,5 fois pour les hommes. La cote graduée, ajustée pour le sexe, l'âge, la race et la scolarité indique une importante relation directe graduée entre les neuf facteurs et la gravité, la durée et la fréquence des agressions sexuelles. Les auteurs notent une relation inverse en ce qui a trait à l'âge au moment de la première agression.

**Conclusions:** Les agressions sexuelles augmentent la probabilité que l'enfant connaîtra d'autres expériences néfastes. Plus l'agression est grave, plus la probabilité augmente. Ces constats devront être pris en considération lorsqu'il s'agit de concevoir des études, des thérapies et des programmes de prévention des agressions sexuelles et de prévention d'autres problèmes touchant l'enfance.

## Resumen

**Objetivo:** Este estudio evalúa la relación del abuso sexual a los niños (CSA) con otras nueve categorías de experiencias infantiles adversas (ACEs), incluyendo abuso a los niños, negligencia, y múltiples tipos de disfunciones familiares.

**Métodos:** Se recogieron los datos retrospectivos de 17,337 adultos pares, miembros de un plan de salud quienes respondieron a una encuesta. Se utilizaron modelos de regresión ajustados por edad, raza, y educación para estimar la fuerza de la asociación del CSA con cada uno de los otros nueve ACEs y una relación corregida entre las medidas de la gravedad del CSA y el número de los otros ACEs (puntaje ACE).

**Resultados:** El 25% de las mujeres y el 16% de los hombres reportaron CSA. En comparación con personas que no habían estado expuestas al CSA, la probabilidad de experimentar cada categoría de ACE aumentó de 2 a 3.4 veces para las mujeres y de 1.6 a 2.5 veces en los hombres ( $p < .05$ ). La media ajustada de los puntajes 3 de ACE presentó una relación corregida positiva significativa con la severidad, duración, y frecuencia del CSA y una relación inversa con la edad en que ocurrió la primera experiencia de CSA ( $p < .01$ ).

**Conclusiones:** El abuso sexual a los niños (CSA) está fuertemente asociado con la presencia de múltiples formas de experiencias adversas en la infancia (CSA). La fuerza de esta asociación parece aumentar según aumentan las medidas de la gravedad del CSA. Debe considerarse la comprensión de la interrelación entre el CSA con múltiples ACE en el diseño de estudios, tratamiento, y programas para prevenir el CSA así como otras formas de ACEs.