

TRAUMA SURVIVOR MENTAL HEALTH

Health Outcomes by Closeness of Sexual Abuse Perpetrator: A Test of Betrayal Trauma Theory

VALERIE J. EDWARDS

Division of Adult and Community Health, Centers for Disease Control and Prevention, Atlanta, Georgia, USA

JENNIFER J. FREYD

Department of Psychology, University of Oregon, Eugene, Oregon, USA

SHANTA R. DUBE and ROBERT F. ANDA

Office of Smoking and Health, Centers for Disease Control and Prevention, Atlanta, Georgia, USA

VINCENT J. FELITTI

Kaiser Permanente Medical Care Program, San Diego, California, USA

Betrayal trauma theory (Freyd, 1996) postulates childhood abuse perpetrated by a caregiver or someone close to the victim results in worse mental health than abuse perpetrated by a noncaregiver. Using the Adverse Childhood Experiences (ACE) data, we tested whether adults with high betrayal (HB) abuse would report poorer functional and mental health than low betrayal (LB) abuse victims. Among those participants reporting childhood sexual abuse, 32% experienced HB abuse. HB victims had a higher average ACE score than LB victims (2.72 vs. 1.87, $p < .001$), had significantly lower functional health scores on 4 of the 7 SF-36 Health Survey

Submitted 15 December 2009; revised 29 September 2011; accepted 1 October 2011.

The findings and conclusions in this article are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

Address correspondence to Valerie J. Edwards, Division of Adult and Community Health, Centers for Disease Control & Prevention, 4770 Buford Highway NE, MS K-67, Atlanta, GA 30341. E-mail: vae2@cdc.gov

scales (all $p < .04$), and reported higher depression, anxiety, suicidality, panic, and anger (all $p < .05$).

KEYWORDS *adverse childhood experiences, betrayal trauma, childhood sexual abuse, SF-36 scores*

Overwhelming evidence collected over the last 30 years has linked childhood abuse to mental health problems (Freyd, Putnam, et al., 2005). Victims of childhood abuse are significantly more likely than nonvictims to suffer from depression (Koverola, Pound, Heger, & Lytle, 1993; Mannarino, Cohen, & Berman, 1994; Molnar, Buka, & Kessler, 2001) and anxiety (Mancini, Van Ameringen, & MacMillan, 1995); and to manifest psychiatric syndromes such as phobia and panic disorder (Stein, Golding, Siegel, Burnam, & Sorenson, 1988), dissociative symptoms (Mulder, Beautrais, Joyce, & Fergusson, 1998; Roesler & McKenzie, 1994; Waldinger, Swett, Frank, & Miller, 1994), post-traumatic stress disorder (PTSD; Thompson, Kaslow, Lane, & Kingree, 2000; Widom, 1999), and personality disorders (Brown & Anderson, 1991; Johnson, Cohen, Brown, Smailes, & Bernstein, 1999). Moreover, childhood sexual abuse (CSA) has been associated with the development of poor health habits such as smoking (Acierno, Kilpatrick, Resnick, Saunders, & Best, 1996; Csoboth, Birkas, & Purebl, 2003), substance abuse (Cohen et al., 2003; Wilsnack, Vogeltanz, Klassen, & Harris, 1997; Windle, Windle, Scheidt, & Miller, 1995), and risky sexual behavior (Bartholomew et al., 1994; Rodgers et al., 2004; Zurbriggen & Freyd, 2004) that are in turn risk factors for physical health problems.

Betrayal trauma theory suggests that traumas involving abuse perpetrated by a caregiver or someone close to the victim result in heightened distress compared to abuse perpetrated by someone less central to the victim's well-being. Moreover, because abuse by a caregiver threatens the attachment bonds of the victim to the abuser, isolation of the knowledge of the abuse might occur as a matter of survival (Freyd, 1996; Freyd, DePrince, & Zurbriggen, 2001). This need for knowledge isolation is theorized to increase the development of dissociative tendencies (Chu & Dill, 1990), and decrease awareness of other interpersonal betrayals compared to persons who were victimized by someone with no caretaking responsibilities (DePrince, 2005). Evidence suggests the effects of betrayal extend beyond cognitive deficits to mental and physical health. Freyd, Klest, and Allard (2005) found a history of betrayal trauma was associated with physical and mental health symptoms in a sample of persons with a 12-month history of chronic medical illness or pain, and Goldsmith, Freyd, and DePrince (2004) reported similar results in a sample of college students. Although these preliminary findings offer support for the prediction that betrayal trauma is associated with negative health outcomes, they were collected from relatively small samples or were collected from college students who might

be too young to exhibit physical sequelae, or from persons with existing physical problems.

Recently, the biological bases of trauma in general and CSA in particular are starting to be elucidated through neuroimaging, which has revealed changes in brain structure (Anderson et al., 2008) as well as in neuroendocrinology among CSA victims with PTSD (Beers & De Bellis, 2002; Bremner et al., 2003). Given that these neurological changes have systemic effects, it is reasonable to posit a biological substrate for health deficits associated with CSA. Results from the Adverse Childhood Experiences (ACE) Study (Felitti et al., 1998) have shown that adult health maintenance organization (HMO) members who reported childhood traumas manifested poorer health in a range of domains, including higher prevalences of heart disease, cancer, and lung disease. Furthermore, the prevalence of these health problems rose as the count of different trauma types increased in a dose-response fashion, indicating a plausible causal link between trauma exposure and higher levels of health disturbances. These findings are consistent with the somatization and health problems that are one of the outcomes associated with the construct of complex trauma (Herman, 1992). The complex trauma criterion, however, extends beyond interpersonal traumas to include other forms of trauma such as combat and severe medical illnesses requiring painful medical treatment. However, in-depth analysis of health outcomes related to aspects of specific trauma types, such as physical or sexual abuse, has not occurred.

In this study, our primary goal was to determine the effects of betrayal trauma as a result of CSA on physical and mental health outcomes in adults. We wanted to extend the findings of Freyd and others in more limited samples to a broader population of adults to increase the generalizability of these findings. We were also interested in using the ACE data set to better characterize the prevalence of betrayal trauma in a large sample, as well as to examine the relations between betrayal and other types of childhood traumas. In addition, we wanted to examine the mediational effects of other types of traumas on betrayal trauma by looking at health outcomes with and without the addition of other traumatic experiences to determine the unique contribution of betrayal to health.

METHOD

Study Design

To explore these questions, we used data from the ACE Study (Felitti et al., 1998) The ACE Study used a retrospective cohorts design to investigate the relation between multiple categories of childhood trauma and health and behavioral outcomes later in life. Detailed descriptions of the ACE Study methods and health outcomes associated with ACEs are available elsewhere

(Anda et al., 2006; Edwards, Anda, Felitti, & Dube, 2003; Felitti et al., 1998). Participants were drawn from adult HMO members undergoing a comprehensive biopsychosocial evaluation at a preventive health clinic in California. Clinic attendees were asked to retrospectively report their childhood experiences with various forms of maltreatment and family dysfunction in a questionnaire mailed to their home. This questionnaire used items adapted from relevant measures including the Conflict Tactics Scale (Straus & Gelles, 1990) and Wyatt (1985) and was developed specifically for this study by its originators (Felitti et al., 1998). Data were collected between August and November 1995 and January and March 1996 (Wave 1), and April and October 1997 (Wave 2).

During Wave 1 of data collection 9,508 (70%) of the 13,494 consecutive patients returned questionnaires. In Wave 2, 8,667 (65%) of 13,330 patients returned questionnaires. Overall there were 18,175 questionnaires returned; however, the final sample consists of 17,337 respondents; this excludes 754 participants who had returned a questionnaire during both survey time frames, and an additional 84 respondents who were excluded because of incomplete demographic information. Clinic attendees who returned the questionnaire tended to be younger and more educated, and were more likely to be women (Edwards et al., 2001). From these 17,337 participants, we restricted our analyses to those who reported CSA and also reported their relationship to their abuser ($n = 3,100$). Women made up roughly two thirds (67.5%, $n = 2,093$) of this group.

Measures

The ACE Study used four questions adapted from Wyatt (1985) to classify respondents as having experienced sexual abuse in childhood (before age 18). Participants were classified as sexually abused if they reported one or more instances of fondling, attempted intercourse, forced sexual touching, or completed intercourse with an adult or person at least 5 years older than themselves. Additional questions asked about the relationship of the abuser to the victim. Abusers could be described as (a) a stranger, (b) a family friend, (c) a relative not living in the home, (d) a nonrelative living in the home, and (e) a relative living in the home. Participants were free to select multiple categories because some participants reported multiple abusers.

To determine if CSA victims whose perpetrator was closer to the victim in terms of kinship bonds would have worse health outcomes, we collapsed the abuser categories to dichotomize abuse victims into high and low betrayal trauma groups. Victims of strangers, friends, or relatives not living in the home were placed in the low betrayal group. Victims of relatives or nonrelatives living in the home were placed in the high betrayal group. If a participant reported multiple abusers, he or she was placed in the high

betrayal group if reporting that at least one of his or her abusers had been a relative or nonrelative living in the home.

The health outcomes we examined fall into two broad categories: functional health and mental health symptoms/self-diagnoses. The functional health outcomes were drawn from the SF-36 scales (Ware & Sherbourne, 1992), which consists of eight subscales:

1. Physical Functioning (PF): The extent to which one can perform normal life activities.
2. Role-Physical (RP): How much work or other daily activities are affected by physical health.
3. Bodily Pain (BP): The extent to which somatic symptoms interfere with the enjoyment of life.
4. General Health (GH): A person's overall assessment of the state of his or her health.
5. Vitality (VT): Energy and activity.
6. Social Functioning (SF): How much one's physical or emotional problems interfere with social activities.
7. Role-Emotional (RE): The extent to which emotional problems interfere with work or other activities.

Higher scores indicate better functioning. Previous analysis of ACE data established that respondents' ACE scores were negatively associated with their SF-36 scale scores in a dose-response fashion (Edwards et al., 2003), such that as the ACE score increased, the SF-36 scale scores decreased concomitantly. The mental health symptoms and self-diagnoses were measured by single dichotomous (yes-no) variables that asked the participants to classify themselves as having depression, anxiety, problems with anger, and panic attacks. The participants were also asked whether they had ever attempted suicide (yes-no).

Other ACEs retrospectively reported were childhood physical abuse, emotional abuse, witnessing interparental violence, parental divorce, family mental illness or substance abuse, and whether a family member had ever been imprisoned. In addition to the individual ACEs, for each participant a total count of ACEs (excluding CSA) was calculated (range = 0-7).

Data Analysis

Descriptive statistics of abuser type were computed both overall and by sex. We examined whether the level of betrayal trauma was related to the prevalence of other reported ACEs. We calculated the relation between level of betrayal trauma and the ACE score. We next performed a series of analyses of health outcomes by level of betrayal trauma. Because the SF-36 survey

was administered only to participants in the second ACE survey wave, our sample size for these analyses was 1,086 rather than 3,100 (720 in the low betrayal group and 366 in the high betrayal group). Mediation analyses were conducted to identify and explain the relationship between betrayal and the functional and mental health outcomes with the inclusion of the ACE score minus sexual abuse (Baron & Kenny, 1986). We chose this approach to distinguish between the direct effects of betrayal and the additional variance that might be accounted for by the other ACEs. The Sobel test (Sobel, 1982) was used to determine the significance of the indirect effect of the independent variable (betrayal) on the dependent variables through the mediator (ACE score minus sexual abuse). When the dependent variable was an SF-36 scale, linear regression techniques were employed. When the dichotomous mental health outcomes were the dependent variables, logistic regression analyses were conducted. In each analysis, we included respondents' sex and age at the time of the survey as control variables.

RESULTS

Descriptive Results

Of the 17,337 participants in the ACE Study, 3,100 (17.8%) met criterion for CSA and reported their relationship to their abuser(s). This is slightly below the overall CSA prevalence of 20.7% among all ACE Study participants because of missing data on abuser type.

Table 1 lists the prevalence of perpetrator type by the sex of the victim. The most commonly reported perpetrator category was a family friend, with almost one third of the participants reporting this type of abuser. Interestingly, the next most common perpetrator category was multiple abusers. In examining the results by sex, men were three times more likely than women to report that the perpetrator was a stranger (26.6% vs. 9.2%).

TABLE 1 Prevalence of Childhood Sexual Abuse Perpetrator Overall and by Sex of Victim

| Perpetrator Category | Overall ^a | | Women ^b | | Men ^c | | Ratio of Women to Men ^a |
|-----------------------------|----------------------|------|--------------------|------|------------------|------|------------------------------------|
| | <i>N</i> | % | <i>n</i> | % | <i>n</i> | % | |
| Low betrayal | | | | | | | |
| Stranger | 461 | 14.9 | 193 | 9.2 | 268 | 26.6 | 0.35 |
| Family friend | 939 | 30.3 | 596 | 28.5 | 343 | 34.1 | 0.83 |
| Relative not living in home | 419 | 13.5 | 314 | 15.0 | 105 | 10.4 | 1.44 |
| Multiple abusers | 691 | 22.3 | 515 | 24.6 | 176 | 17.5 | 1.41 |
| High betrayal | | | | | | | |
| Nonrelative living in home | 85 | 2.7 | 63 | 3.0 | 22 | 2.2 | 1.36 |
| Relative living in home | 505 | 16.3 | 412 | 19.7 | 93 | 9.2 | 2.14 |
| Multiple abusers | 691 | 22.3 | 515 | 24.6 | 176 | 17.5 | 1.41 |

^a*N* = 3,100. ^b*n* = 2,093. ^c*n* = 1,007.

Conversely, women were much more likely to report that the perpetrator was someone they trusted. As the closeness of the perpetrator–victim relationship increased, the proportion of women to men generally rose also, so that the highest ratio of female-to-male difference in perpetrator type involved a family member living in the home. In this category, women were 2.14 times more likely to report this type of a perpetrator than were men (19.7% for women vs. 9.2% for men). The chi-square for perpetrator type by sex of victim was statistically significant, $\chi^2(5, N = 3,100) = 218.59$, $p < .001$. Sex differences persisted when the individual perpetrator types were collapsed to form the high betrayal and low betrayal groups. Overall, 38.4% ($n = 803$) of women reporting CSA were in the high betrayal group compared with 21.4% ($n = 216$) of men, indicating that among adults who experienced CSA, women were 1.8 times more likely to have experienced high betrayal abuse than men, $\chi^2(1, N = 3,100) = 88.17$, $p < .001$.

To determine if the number of additional ACEs reported by the high and low betrayal groups differed, we examined the mean ACE scores (excluding sexual abuse, range = 0–7) by betrayal trauma group in an analysis of variance. Participants in the high betrayal group had significantly higher mean ACE scores than those in the low betrayal group (2.72 vs. 1.87), $F(1, 3,098) = 171.1$, $p < .001$. In our chi-square analyses we found that those in the high betrayal group were also significantly more likely to have reported each category of ACE (Table 2). Overall, 86.9% of the high betrayal CSA victims reported at least one other ACE, compared with 76.1% of the low betrayal CSA victims.

TABLE 2 Prevalence of Individual Adverse Childhood Experiences (ACEs) and ACE score by Level of Betrayal

| ACE | Low Betrayal Group | | High Betrayal Group | | χ^2 |
|-----------------------------------|--------------------|------|---------------------|------|----------|
| | <i>n</i> | % | <i>n</i> | % | |
| Parental divorce/separation | 667 | 32.1 | 463 | 45.3 | 52.9* |
| Household substance abuse | 778 | 37.4 | 529 | 51.9 | 59.2* |
| Household mental illness | 603 | 29.0 | 446 | 43.8 | 66.9* |
| Witnessing violence toward mother | 402 | 19.3 | 328 | 32.2 | 62.9* |
| Family member went to prison | 141 | 6.8 | 136 | 13.3 | 36.3* |
| Emotional abuse | 390 | 18.7 | 334 | 32.8 | 75.3* |
| Physical abuse | 906 | 43.5 | 540 | 53.0 | 24.6* |
| ACE score ^a | | | | | 152.8* |
| 0 | 498 | 23.9 | 133 | 13.1 | |
| 1 | 534 | 25.7 | 178 | 17.5 | |
| 2 | 391 | 18.8 | 175 | 17.2 | |
| 3 | 298 | 14.3 | 184 | 18.1 | |
| 4 or more | 360 | 17.3 | 349 | 34.2 | |

Note. $N = 3,100$.

^aExcluding childhood sexual abuse.

* $p < .0001$.

RELATION BETWEEN LEVEL OF BETRAYAL AND FUNCTIONAL HEALTH

We next performed a series of analyses to test the predictive power of betrayal on a variety of health outcomes. To test for differences in SF-36 scale scores, we used SPSS PROC GLM (SPSS, 2005), with level of betrayal as the sole fixed factor, controlling for respondents' age and sex (Table 3). Lower scale scores indicate poorer functioning. Using this model, we found that adjusted mean SF-36 scores were significantly higher among adults who had experienced low betrayal abuse than among those who had experienced high betrayal abuse on four of the scales: Role-Physical (79.4 vs. 74.8), $F(1, 1,084) = 4.29, p < .04$; Role-Emotional (85.5 vs. 78.7), $F(1, 1,084) = 11.01, p < .001$; Mental Health (68.6 vs. 66.5), $F(1, 1,084) = 7.83, p < .005$; and Social Functioning (87.0 vs. 81.1), $F(1, 1,084) = 20.25, p < .0001$.

RELATION BETWEEN LEVEL OF BETRAYAL AND MENTAL HEALTH

We used the same approach to test for the effects of betrayal on the dichotomous measures of self-reported mental health symptoms. For these outcomes, we used logistic regression. Table 4 contains the adjusted odds ratios (controlling for age and sex) and confidence intervals associated with each outcome measure by betrayal trauma level. As shown in Table 4, having

TABLE 3 Adjusted mean SF-36 scale scores by level of betrayal^a

| SF-36 Scale | Level of Betrayal | <i>M</i> |
|------------------------|-------------------|---------------------------|
| | | [95% Confidence Interval] |
| Physical Functioning | Low | 82.1 [80.6, 83.6] |
| | High | 81.3 [79.2, 83.4] |
| Role-Physical* | Low | 79.5 [77.0, 82.1] |
| | High | 75.0 [71.5, 78.6] |
| Role-Emotional*** | Low | 85.6 [83.2, 88.0] |
| | High | 78.7 [75.4, 82.0] |
| Bodily Pain | Low | 69.1 [67.3, 71.0] |
| | High | 67.8 [65.3, 70.2] |
| Vitality | Low | 51.0 [49.9, 52.0] |
| | High | 50.4 [49.0, 51.9] |
| Mental Health** | Low | 68.6 [67.8, 69.5] |
| | High | 66.5 [65.3, 67.7] |
| Social Functioning**** | Low | 87.1 [85.6, 88.5] |
| | High | 81.1 [79.0, 83.2] |
| General Health | Low | 75.3 [74.0, 76.7] |
| | High | 74.6 [72.7, 76.4] |

Note. $n = 1,088$.

^aAdjusted for age and sex.

* $p < .05$. ** $p < .005$. *** $p < .001$. **** $p < .0001$.

TABLE 4 Association between Betrayal Trauma Level and Self-Reported Mental Health Symptoms

| Mental Health Symptom | Prevalence (%) | Adjusted Odds Ratio ^a [95% Confidence Interval] |
|-------------------------|----------------|---|
| Depression | | |
| Low betrayal (referent) | 37.5 | 1.0 |
| High betrayal | 49.8 | 1.38 [1.19, 1.63]***** |
| Suicide attempts | | |
| Low betrayal (referent) | 8.1 | 1.0 |
| High betrayal | 13.6 | 1.50 [1.17, 1.91]**** |
| Anxiety | | |
| Low betrayal (referent) | 12.5 | 1.0 |
| High betrayal | 17.0 | 1.24 [1.00, 1.54]** |
| Problems with anger | | |
| Low betrayal (referent) | 8.6 | 1.0 |
| High betrayal | 12.4 | 1.47 [1.14, 1.88]*** |
| Panic attacks | | |
| Low betrayal (referent) | 15.5 | 1.0 |
| High betrayal | 20.9 | 1.27 [1.04, 1.54]* |

Note. $N = 3,100$.

^aAdjusted for age and sex.

* $p < .02$. ** $p < .05$. *** $p < .003$. **** $p < .001$. ***** $p < .0001$.

a high betrayal abuser significantly increased the odds of reporting each of the mental health symptoms. Suicide attempts and problems with anger were 1.5 times more likely in high betrayal victims than in low betrayal victims (AORs = 1.5 and 1.47, respectively). Depression, panic attacks, and anxiety were elevated between 1.25 and 1.38 in high betrayal victims compared with CSA victims with low betrayal abusers.

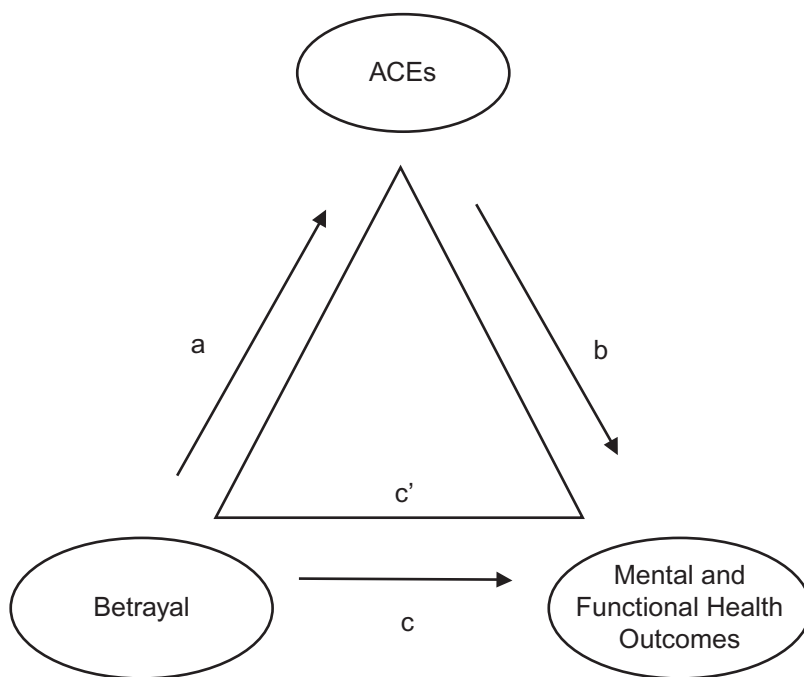
Mediation of betrayal by the ACE score

For those outcomes that were significantly related to level of betrayal, Table 5 contains the coefficients, standard errors, and p values for the Sobel test for mediation of the outcome variables by the ACE score. For the SF-36 scales, we performed three regression analyses to derive the test statistic (see Figure 1). We modeled the direct effect of the ACE score on the outcome variable (Path b), the direct effect of betrayal on the outcome variable (Path c), and the indirect effect of betrayal on the outcome variable (through the ACE score; Path c'). To derive the coefficients and standard error terms for the Sobel test, we used linear regression for the SF-36 scales, and logistic regression for the dichotomous mental health outcomes. All regression analyses included age and sex as covariates. Among the SF-36 scale scores, the effect of betrayal was partially mediated by the ACE score on three of the four scales (Role-Emotional, Mental Health, and Social Functioning) accounting for 24.6%, 30.9%, and 37.3% of the variance in the relationship

TABLE 5 Unstandardized Coefficients, Standard Errors, and Test Statistics for Mediation of Outcome Variables by the Adverse Childhood Experiences Score

| Outcome | β_b (SE) | β_c (SE) | $\beta_{c'}$ (SE) | Test Statistic | <i>p</i> Value |
|------------------------|----------------|----------------|-------------------|----------------|----------------|
| SF-36 scale | | | | | |
| Role-Physical | -3.27 (0.58) | -5.25 (2.18) | -2.33 (2.22) | 1.86 | > .05 |
| Role-Emotional | -2.30 (0.53) | -8.53 (1.97) | -6.43 (2.01) | 2.58 | < .01 |
| Mental Health | -0.85 (0.19) | -2.35 (0.71) | -1.62 (0.72) | 1.86 | < .06 |
| Social Functioning | -2.4 (0.34) | -5.75 (1.3) | -3.61 (1.30) | 2.36 | < .02 |
| Mental health outcomes | | | | | |
| Depression | 0.39 (0.04) | 0.15 (0.04) | 0.08 (0.04) | 6.47 | < .001 |
| Suicide attempts | 0.67 (0.07) | 0.21 (0.07) | 0.09 (0.07) | 6.61 | < .001 |
| Anxiety | 0.40 (0.06) | 0.10 (0.06) | 0.03 (0.06) | 5.43 | < .001 |
| Anger | 0.94 (0.13) | 0.74 (0.08) | 0.21 (0.13) | 5.78 | < .001 |
| Panic attacks | 0.31 (0.05) | 0.10 (0.05) | 0.05 (0.06) | 4.81 | < .001 |

between betrayal and the scale scores. The addition of the ACE score to the Role-Physical score indicated complete mediation. Among the dichotomous mental health outcomes, the ACE score fully mediated the relationship between betrayal and depression (45.0%), anxiety (52.9%), anger (44.3%), panic (73.0%), and suicidality (60%), respectively.



b and c' = both ACE(s) and Betrayal in the model.

FIGURE 1 Mediation model.

DISCUSSION

There are several notable aspects of this study. First, we had the unique opportunity to measure the prevalence for each category of sexual abuser in a large sample representative of U.S. adults with access to high-quality health care. Overall, about a third of ACE respondents who reported CSA reported a high betrayal abuser. Women, however, were significantly more likely to report a high betrayal abuser than were men, by an almost 2-to-1 margin. These results mirror those of Goldberg and Freyd (2006), who found a gender difference for exposure to a range of betrayal versus nonbetrayal trauma. Interestingly, over 20% of our sample reported multiple abusers. Among high betrayal abuse victims, 42.1% reported an additional abuser, compared to 12.6% among low betrayal abuse victims, suggesting that high betrayal trauma is linked to a greater risk of additional sexual victimization. Although it is not possible with this data set to disentangle whether these experiences occurred serially or simultaneously, other research has confirmed that CSA leads to greater vulnerability to additional sexual victimizations throughout the life span (for a review of the literature see Classen, Paresh, & Aggarwal, 2005). However, more longitudinal research is needed to understand the associated risk mechanisms.

Similarly, betrayal trauma was also related to reporting other categories of ACEs. However, these ACEs were not equally distributed by betrayal trauma level. We found that respondents in the high betrayal group had a significantly higher prevalence of each category of ACE. In fact, only 13.1% in the high betrayal group reported no other ACEs, compared with almost a quarter (23.9%) of those in the low betrayal group. Almost twice as many high betrayal victims reported the highest ACE scores of 4 or more (34.2% vs. 17.3%). Future research should address this issue with more precise information on the timing and co-occurrence of abuse.

We also found significant associations between the betrayal trauma level reported by CSA victims and their scores on four of the seven SF-36 scales (Role-Physical, Role-Emotional, Social Functioning, and Mental Health). Although mean scale score differences might not be clinically significant, it is important to point out that this subsample is composed entirely of individuals who experienced at least some form of CSA, if not other ACEs as well. As such, the scale means in the high betrayal group are considerably lower than the overall ACE Study sample in the Role-Emotional (86.5 vs. 78.7), Bodily Pain (67.7 vs. 71.2), Vitality (50.4 vs. 61.6), and Social Functioning (87.3 vs. 81.1) scales (Edwards et al., 2003). Those subscales that were most closely related to physical functioning showed less sensitivity to the effects of betrayal. For each of the binary mental health symptoms and conditions, membership in the high betrayal group increased the odds of reporting the symptom between 1.24 times for anxiety and approximately 1.5 times for problems with anger and suicide attempts.

The addition of the ACE score partially mediated the effects of betrayal on the Role-Emotional, Social Functioning, and Mental Health scales, and fully mediated the relationship between level of betrayal and the Role-Physical scale of the SF-36. All the binary mental health outcomes were completely mediated by the ACE score. These results are not unexpected, however, given that some of the other ACEs included as predictors also represent betrayals, such as physical and emotional abuse. Therefore the addition of other ACEs constitutes a conservative test of betrayal trauma theory, as these variables most likely overcontrol for the emotionally valenced component of trauma associated with the other ACEs. Furthermore, the temporal order of the sexual abuse from which betrayal is derived cannot be assumed to precede the experience of the other seven ACEs, as this information is not available. Although this does not invalidate the model under consideration, alternate models might better reflect actual experience. Overall, these findings reflect the complexity of the effects of betrayal on physical and mental health, some of which might be direct, whereas others are mediated by exposure to other ACEs.

Certain limitations associated with these data must be emphasized. We were not able to measure betrayal trauma directly in this sample. Rather, we used the existing categories from the ACE Study to classify respondents into high and low betrayal trauma groups. To approximate the effects of betrayal among participants who reported CSA, we considered that those who lived in the home, whether a relative or nonrelative, would be more likely to be in a caregiving role than a perpetrator who did not live with the victim. Stronger effects have been found when betrayal trauma was measured more directly (Freyd et al., 2001; Goldberg & Freyd, 2006). A second limitation is that the CSA and other ACEs reported by the participants cannot be independently verified. However, the prevalence of CSA in this sample is comparable to that found in other large, representative samples (MacMillan et al., 1997; Moeller, Bachmann, & Moeller, 1993), as well as the results of a recent meta-analysis (Pereda, Guilera, Forns, & Gomez-Benito, 2009). A third limitation to this study is that the mental health outcomes were measured with single-item dichotomous questions that cannot be considered substitutes for clinical diagnoses. The final limitation is that members of the ACE Study sample were overwhelmingly White and well-educated and thus not representative of the U.S. population as a whole, although the sample could be considered representative of persons with access to high-quality health care. Nonetheless, given the size of the sample and the fact that participants were not selected on the basis of any particular physical or psychological conditions, our results are far more generalizable than those from much of the earlier research in this area.

We found that betrayal trauma is associated with victims' later-life health outcomes. This confirms that the effects associated with betrayal trauma extend beyond the cognitive alterations noted by Freyd and others to

decrements in health-related quality of life as well as to mental-health-related symptoms and conditions. In this study, the addition of the ACE score partially mediated the functional health outcomes, and completely mediated the dichotomous mental health outcomes. More research is needed to disentangle the effects of betrayal from other co-occurring trauma exposures. Moreover, we found that level of betrayal trauma as an aspect of CSA might provide an important organizing principle to better explain trauma outcomes than more commonly studied trauma characteristics such as severity or frequency, although we were not able to directly test this hypothesis. In addition, betrayal trauma might provide a valuable framework for understanding the etiology of polyvictimization. Overall, our results suggest the need to more accurately measure betrayal trauma in stressful life events to determine the future health risks associated with these events. Further explorations of betrayal trauma in relation to health should be undertaken to improve our ability to target those most likely to experience health decrements decades after victimization.

REFERENCES

- Acierno, R., Kilpatrick, D. G., Resnick, H. S., Saunders, B. E., & Best, C. L. (1996). Violent assault, posttraumatic stress disorder, and depression: Risk factors for cigarette use among adult women. *Behavior Modification, 20*(4), 363–384.
- Anda, R. F., Felitti, V. J., Walker, J., Whitfield, C. L., Bremner, J. D., Perry, B. D., et al. (2006). The enduring effects of abuse and related adverse experiences in childhood: A convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neurosciences, 56*(3), 174–186.
- Anderson, S. L., Tomada, A., Vincow, E. S., Valente, E., Polcari, A., & Teicher, M. H. (2008). Preliminary evidence for sensitive periods in the effect of childhood sexual abuse on regional brain development. *Journal of Neuropsychiatry and Clinical Neuroscience, 20*(3), 292–301.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182.
- Bartholomew, B. N., Doll, L. S., Joy, D., Douglas, J. M., Bolan, G, Harrison, J. S., et al. (1994). Emotional, behavioral, and HIV risks associated with sexual abuse among adult homosexual and bisexual men. *Child Abuse & Neglect, 18*(9), 747–761.
- Beers, S. R., & De Bellis, M. D. (2002). Neuropsychological function in children with maltreatment-related posttraumatic stress disorder. *American Journal of Psychiatry, 159*(3), 483–486.
- Bremner, J. D., Vythilingam, M., Vermetten, E., Southwick, S. M., McGlashan, T., Nazeer, A., et al. (2003). MRI and PET study of deficits in hippocampal structure and function in women with childhood sexual abuse and posttraumatic stress disorder. *American Journal of Psychiatry, 160*(5), 924–932.

- Brown, G., & Anderson, B. (1991). Psychiatric morbidity in adult inpatients with childhood histories of sexual and physical abuse. *American Journal of Psychiatry*, *148*(1), 55–61.
- Chu, J. A., & Dill, D. L. (1990). Dissociative symptoms in relation to childhood physical and sexual abuse. *American Journal of Psychiatry*, *147*(7), 887–892.
- Classen, C. C., Palesh, O. G., & Aggarwal, R. (2005). Sexual revictimization: A review of the empirical literature. *Trauma, Violence, and Abuse*, *6*(2), 105–129.
- Cohen, J. B., Dickow, A., Horner, K., Zweben, J. E., Balabis, J., Vandersloot, D., et al. (2003). Abuse and violence history of men and women in treatment for methamphetamine dependence. *The American Journal on Addictions*, *12*(5), 377–385.
- Csoboth, C. T., Birkas, E., & Purebl, G. (2003). Physical and sexual abuse: Risk factors for substance use among young Hungarian women. *Behavioral Medicine*, *28*(4), 165–171.
- DePrince, A. P. (2005). Social cognition and revictimization risk. *Journal of Trauma and Dissociation*, *6*, 125–141.
- Edwards, V. J., Anda, R. F., Felitti, V. J., & Dube, S. R. (2003). Adverse childhood experiences and health-related quality of life as an adult. In K. Kendall-Tackett (Ed.), *Health consequences of abuse in the family: A clinical guide for evidence-based practice* (pp. 81–94). Washington, DC: American Psychological Association.
- Edwards, V. J., Anda, R. F., Nordenberg, D. F., Felitti, V. J., Williamson, D. F., Howard, N., et al. (2001). Factors affecting probability of response to a survey about childhood abuse. *Child Abuse & Neglect*, *25*(2), 307–312.
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., et al. (1998). Relationship of child abuse and household dysfunction to many of the leading causes of death in adults. *American Journal of Preventive Medicine*, *14*(4), 245–258.
- Freyd, J. J. (1996). *Betrayal trauma: The logic of forgetting childhood abuse*. Cambridge, MA: Harvard University Press.
- Freyd, J. J., DePrince, A. P., & Zurbriggen, E. L. (2001). Self-reported memory for abuse depends upon victim–perpetrator relationship. *Journal of Trauma & Dissociation*, *2*(3), 5–17.
- Freyd, J. J., Klest, B., & Allard, C. B. (2005). Betrayal trauma: Relationship to physical health, psychological distress, and a written disclosure intervention. *Journal of Trauma & Dissociation*, *6*(3), 83–104.
- Freyd, J. J., Putnam, F. W., Lyon, T. D., Becker-Blease, K. A., Cheit, R. E., Siegel, N. B., et al. (2005). The science of child sexual abuse. *Science*, *308*(5271), 501.
- Goldberg, L. R., & Freyd, J. J. (2006). Self-reports of potentially traumatic experiences in an adult community sample: Gender differences and test–retest stabilities of the items in a Brief Betrayal-Trauma Survey. *Journal of Trauma & Dissociation*, *7*(3), 39–63.
- Goldsmith, R. E., Freyd, J. J., & DePrince, A. P. (2004, February). *Health correlates of exposure to betrayal trauma*. Poster presented at the annual meeting of the American Association for the Advancement of Science, Seattle, WA.
- Herman, J. L. (1992). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. *Journal of Traumatic Stress*, *5*(3), 377–391.

- Johnson, J. G., Cohen, P., Brown, J., Smailes, E. M., & Bernstein, D. P. (1999). Childhood maltreatment increases risk for personality disorders during early adulthood. *Archives of General Psychiatry*, *56*(7), 600–606.
- Koverola, C., Pound, J., Heger, A., & Lytle, C. (1993). Relationship of child sexual abuse to depression. *Child Abuse & Neglect*, *17*(3), 393–400.
- MacMillan, H. L., Fleming, J. E., Trocme, N., Boyle, M. H., Wong, M., Racine, Y. A., et al. (1997). Prevalence of child physical and sexual abuse in the community: Results from the Ontario Health Supplement. *Journal of the American Medical Association*, *278*(2), 131–135.
- Mancini, C., Van Ameringen, M., & MacMillan, H. (1995). Relationship of childhood sexual and physical abuse to anxiety disorders. *Journal of Nervous and Mental Disease*, *183*(5), 309–314.
- Mannarino, A. P., Cohen, J. A., & Berman, S. R. (1994). The relationship between preabuse factors and psychological symptomatology in sexually abused girls. *Child Abuse & Neglect*, *18*(1), 63–71.
- Moeller, T. P., Bachmann, G. A., & Moeller, J. R. (1993). The combined effects of physical, sexual, and emotional abuse during childhood: Long-term health consequences for women. *Child Abuse & Neglect*, *17*(5), 623–640.
- 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*(5), 753–760.
- Mulder, R. T., Beautrais, A. L., Joyce, P. R., & Fergusson, D. M. (1998). Relationship between dissociation, childhood sexual abuse, childhood physical abuse, and mental illness in a general population sample. *American Journal of Psychiatry*, *155*(6), 806–811.
- Pereda, N., Guilera, G., Forns, M., & Gomez-Benito, J. (2009). The prevalence of child sexual abuse in community and student samples: A meta-analysis. *Clinical Psychology Review*, *29*(4), 328–338.
- Rodgers, C. S., Lang, A. J., Laffaye, C., Satz, L. E., Dresselhaus, T. R., & Stein, M. B. (2004). The impact of individual forms of childhood maltreatment on health behavior. *Child Abuse & Neglect*, *28*(5), 575–586.
- Roesler, T. A., & McKenzie, N. (1994). Effects of childhood trauma on psychological functioning in adults sexually abused as children. *Journal of Nervous and Mental Disease*, *182*(3), 145–150.
- Sobel, M. E. (1982). Asymptotic intervals for indirect effects in structural equations models. In S. Leinhardt (Ed.), *Sociological methodology* (pp. 290–312). San Francisco, CA: Jossey-Bass.
- SPSS (Version 14 for Windows). Chicago, IL: SPSS.
- Stein, J. A., Golding, J. M., Siegel, J. M., Burnam, M. A., & Sorenson, S. B. (1988). Long-term psychological sequelae of child sexual abuse: The Los Angeles Epidemiologic Catchment Area Study. In G. E. Wyatt & G. J. Powell (Eds.), *Lasting effects of child sexual abuse* (pp. 135–154). Thousand Oaks, CA: Sage.
- Straus, M., & Gelles, R. J. (1990). *Physical violence in American families: Risk factors and adaptation to violence in 8,145 families*. New Brunswick, NJ: Transaction Press.
- Thompson, M. P., Kaslow, N. J., Lane, D. B., & Kingree, J. B. (2000). Childhood maltreatment, PTSD, and suicidal behavior among African American females. *Journal of Interpersonal Violence*, *15*(3), 3–15.

- Waldinger, R. J., Swett, C., Frank, A., & Miller, K. (1994). Levels of dissociation and histories of reported abuse among women outpatients. *Journal of Nervous and Mental Disease, 182*(11), 625–630.
- Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-Item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical Care, 30*, 473–483.
- Widom, C. S. (1999). Posttraumatic stress disorder in abused and neglected children grown up. *American Journal of Psychiatry, 156*(8), 1223–1229.
- Wilsnack, S. C., Vogeltanz, N. D., Klassen, A. D., & Harris, R. T. (1997). Childhood sexual abuse and women's substance abuse: National survey findings. *Journal of Studies on Alcohol, 58*(3), 264–271.
- Windle, M., Windle, R. C., Scheidt, D. M., & Miller, G. B. (1995). Physical and sexual abuse and associated mental disorders among alcoholic inpatients. *American Journal of Psychiatry, 152*(8), 1322–1328.
- Wyatt G. E. (1985). The sexual abuse of Afro-American and white-American women in childhood. *Child Abuse and Neglect, 9*(4), 507–519.
- Zurbriggen, E. L., & Freyd, J. J. (2004). The link between child sexual abuse and risky sexual behavior: The role of dissociative tendencies, information-processing effects, and consensual sex decision mechanisms. In L. J. Koenig, L. S. Doll, & A. O'Leary (Eds.), *From child sexual abuse to adult sexual risk: Trauma, revictimization, and intervention* (pp. 135–157). Washington, DC: American Psychological Association.