Association between self-reported health and physical and/or sexual abuse experienced before age 18 ☆

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ABSTRACT

Objective: The present study evaluated the association between women's health and physical and sexual abuse suffered before age 18.
Methods: A total of 3,568 randomly sampled insured women ages 18–64 completed a telephone interview to assess history of physical only, sexual only, or both physical and sexual abuse before age 18 (Behavioral Risk Factor Surveillance System); and current health (Short Form-36, Center for Epidemiologic Studies-Depression, Presence of Symptoms surveys). Adjusted analyses compared the health of women with physical abuse only, sexual abuse only, or physical and sexual abuse to the health of women without these abuse histories.
Results: Poorest health status was observed in women with a history of both physical and sexual child abuse compared to women without these abuse histories. In models that adjusted for age and income, women with both abuse types had increased prevalence of depression (prevalence ratio, 2.16), severe depression (PR, 2.84), physical symptoms (PR range, 1.33 for joint pain to 2.78 for nausea/vomiting), fair/poor health (PR, 1.84), and lower SF-36 scores (3.15–5.40 points lower). Women with physical abuse only or sexual abuse only also had higher prevalence of symptoms and lower SF-36 scores but the associations were not as strong.
Conclusions: This study adds to the literature showing a graded association between multiple adverse events in childhood and adult health.

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Introduction

Women with a history of physical and/or sexual child abuse experience adverse health into adulthood, including cardiovascular symptoms, impaired physical function, pain, gastrointestinal symptoms, gynecological disorders, depressive disorders, and psychosomatic symptoms of anxiety, panic, or post-traumatic stress disorder (Arnow, 2004; Batten, Aslan, Maciejewski, & Mazure, 2004; Bensley, Van Eenwyk, & Wynkoop Simmons, 2003; Carlson, McNutt, & Choi, 2003; McCauley et al., 1997; Moeller, Bachmann, & Moeller, 1993; Newman et al., 2000; Nicolaidis, Curry, McFarland, & Gerrity, 2004; Walker

et al., 1999). However, in all but one of these studies, it was not possible to determine health effects attributable to physical versus sexual childhood abuse.

Bensley et al. (2003) isolated the health effects of physical versus sexual child abuse. Their study found that women who experienced physical abuse only were twice as likely to report poor physical health and 3.4 times more likely to report frequent mental distress than women without the abuse histories examined in their study (physical, sexual, witnessing violence between parents). Women with childhood sexual abuse only were 2.1 times as likely to report frequent mental distress than women without an abuse history. Other studies that examined health associated with physical only or sexual only child abuse history concentrated on combined samples of women and men (Teicher, Samson, Polcari, & McGreenery, 2006).

Despite the important contribution of the Bensley study, it did not evaluate the specific health effects for women who experienced both physical and sexual child abuse. Studies suggest a graded relationship between adverse childhood exposures (including child abuse) and poor health in adulthood—the more traumatic exposures in childhood, the more adverse adult health behaviors and consequences, such as smoking, heart disease, cancer, emphysema, skeletal fractures and poor self-rated health (Anda et al., 1999; Bensley et al., 2003; Edwards, Holden, Felitti, & Anda, 2003; Felitti et al., 1998; Teicher et al., 2006). These findings suggest that the health effects of multiple types of abuse experiences accumulate and worsen over time, leading to poorer adult health than if only one type of abuse was experienced (Irving & Ferraro, 2006).

Additionally, while prior studies reported useful information regarding the relationship between women's health and history of physical and sexual child abuse, many used clinic-based samples (Hulme, 2000; McCauley et al., 1997; Moeller et al., 1993; Nicolaidis et al., 2004), reported a narrow range of health outcomes (Batten et al., 2004; Carlson et al., 2003), and did not account for intimate partner violence (IPV) exposure in adulthood (Batten et al., 2004; Hulme, 2000; Moeller et al., 1993; Newman et al., 2000; Nicolaidis et al., 2004; Walker et al., 1999). Studies have shown a strong association between physical and sexual childhood abuse and IPV exposure in adulthood (Bensley et al., 2003; Coid et al., 2001; Thompson et al., 2006; Whitfield, Anda, Dube, & Felitti, 2003), and also adverse health associated with IPV (Bonomi et al., 2006; Campbell et al., 2002; Carlson et al., 2003; Centers for Disease Control and Prevention, 1998; Coker, Smith, Bethea, King, & McKeown, 2000; Kramer, Lorenzon, & Mueller, 2004; McCauley et al., 1995; Nicolaidis et al., 2004). Thus, in studies that did not account for IPV, it is unknown whether the relationship between health status and child abuse history persists after accounting for the effects of IPV.

The present investigation adds to the literature by describing the relationship between women's health and history of physical only, sexual only, or both physical and sexual childhood abuse (in models that account for and do not account for IPV in adulthood). We use a population-based random sample drawn from the membership files of a large health plan, and examine a wide range of physical, mental and social health indicators including data from the widely used SF-36 survey (Ware, Kosinski, & Dewey, 2000).

Methods

Sample and data collection

The study was approved by Group Health Cooperative's Institutional Review Board. Group Health is a large prepaid health plan providing health services to more than 500,000 people in Washington State and northern Idaho. English-speaking women ages 18–64 who were enrolled at Group Health for at least 3 years were randomly sampled from enrollment files to participate in a telephone survey to assess intimate partner violence exposure and health status (Bonomi et al., 2006; Thompson et al., 2006). Women were also asked about history of child abuse before age 18 as part of an assessment of risk factors for IPV (described below). According to approved IRB procedures, an advance letter was mailed to women describing our interest in issues affecting women's health (Bonomi et al., 2006; Thompson et al., 2006). After the advance letter was sent, we contacted women by telephone to ascertain their interest and consent to participate in our study (Bonomi et al., 2006; Thompson et al., 2006).

Of 6,666 women randomly sampled, 345 were excluded because they: did not meet the sampling criteria identified in the Group Health automated health plan records (209); were deceased (3); were too ill (15); or did not speak English or had a hearing impairment (118). Of the 6,321 remaining women, 1,829 (28.9%) refused participation when initially contacted by the study staff, 539 (8.5%) started but did not complete the interview, 385 (6.1%) could not be located, and 3,568 (56.4%) completed the telephone survey.

To assess potential non-response bias due to the 56.4% response rate, we requested additional human subjects' approval to obtain limited data on non-respondents. Propensity scores were computed using logistic regression to estimate the probability of response adjusted for age, length of enrollment at Group Health, and health care utilization in the year prior to the survey. The estimated probability of response was slightly higher for women with a history of abuse as a child compared to women who reported no abuse history (0.59 versus 0.58, $p < 0.01$). However, this small difference should not introduce bias in the study findings.

In the telephone survey, women were first asked the full range of health measures, and then were asked about their history of abuse. The questions on child abuse history were some of the last questions (along with demographic questions) to be asked of women.

Exposure definitions

Childhood abuse

Women were asked about their history of childhood physical abuse ("before you were 18, was there any time when you were punched, kicked, choked or received at more serious physical punishment from a parent or other adult guardian") and childhood sexual abuse ("before you were 18, did anyone ever touch you in a sexual place or make you touch them when you did not want them to") using two questions from the Behavioral Risk Factor Surveillance System (Thompson et al., 2006). Due to the survey length, we did not ask about other child abuse and maltreatment subtypes, the severity or chronicity of the abuse, or the perpetrator type for women's experience of childhood sexual abuse as others have advocated (Dong et al., 2004; Manly, 2005). However, for women reporting sexual child abuse, 75.7% of women indicated that they first experienced the abuse at age 12 or younger; 66.9% said the first occurrence occurred at age 11 or younger; and 62.1% said the first occurrence happened at age 10 and younger. While this does not rule out the possibility that women may have experienced dating violence of a sexual nature before age 18, a substantial proportion of women likely experienced sexual abuse of non-dating nature given this age distribution.

From the two questions on physical and sexual child abuse, four exposure groups were constructed: (1) women who experienced physical child abuse only; (2) women who experienced sexual child abuse only; (3) women who experienced both physical and sexual child abuse; and (4) women who experienced neither physical nor sexual child abuse.

Intimate partner violence

Women were asked about exposure to physical, sexual, or non-physical intimate partner violence by a heterosexual or homosexual partner since age 18. As previously described (Bonomi et al., 2006; Thompson et al., 2006), two well-validated questionnaires were used to assess IPV exposure: five questions from the Behavioral Risk Factor Surveillance System, which assessed exposure to physical, sexual or non-physical (threats and chronic controlling behavior) abuse (Saltzman, Fanslow, McMahon, & Shelley, 1999; Vest, Catlin, Chen, & Brownson, 2002); and 10 questions from the Women's Experience with Battering Scale, which assessed the underlying experience of fear and loss of power and control that may accompany exposure to abusive behavioral tactics (Smith, Earp, & DeVellis, 1995). According to published scoring guidelines, women who said they experienced any type of violence according to the BRFSS questions or who had WEB scores that were 20 or higher (score range, 10–60) were considered exposed to IPV (Bonomi et al., 2006; Thompson et al., 2006).

Sociodemographic variables

Women were asked about their age, household income, employment status, highest grade level completed, race/ethnicity, and number of children living in the home using questions from the U.S. Census Bureau (U.S. Census Bureau, 2002).

Adult health

- *General health, physical, social and mental functioning.* Twenty questions from the widely used Short Form-36 (SF-36) Health Survey, version 2 were used to create four of the eight SF-36 validated subscales (vitality, mental health, emotional functioning, and social functioning in the past 4 weeks) and two overall health component summaries—physical component summary (PCS) and mental component summary (MCS) (Bonomi et al., 2006; Ware et al., 2000). One question from the SF-36 was used to assess women's general health ("In general, would you say your health is . . . excellent, very good, good, fair or poor"). We administered only 20 questions from the SF-36 to minimize respondent burden while still being able to define meaningful health indicators. The SF-36 subscale scores and the PCS and MCS scores were continuous and were standardized to have a mean of 50 and standard deviation of 10, with higher scores indicating better functioning. These standardized scores allow for easy comparisons across subscales and clinical populations (Ware et al., 2000). According to other studies, the single item of general health was dichotomized (fair/poor versus good/very good/excellent health) (Diehr & Patrick, 2003; Diehr, Patrick, McDonell, & Fihn, 2003). Coefficient alpha was high for all of the SF-36 subscales (range, 0.79 for role emotional subscale to 0.83 for the social functioning subscale) and for the PCS (0.78) and MCS (0.77) in our sample.
- *Depression.* Women rated the frequency of depressive symptoms (0 = less than 1 day per week to 3 = 5 or more days per week) using five questions from the 20-item Center for Epidemiological Studies-Depression (CES-D) scale (Shrout & Yager, 1989). Coefficient alpha for the 5 CES-D questions was 0.76 in our sample. Shrout and Yager previously demonstrated strong validity of these 5 CES-D questions in detecting depressive symptoms, with sensitivities ranging from 0.94 to 0.95 compared to the 20-item version (Shrout & Yager, 1989). According to the CES-D scoring procedures (Shrout & Yager, 1989), scores for each of the 5 items were summed and dichotomized to categorize women according to their depressive symptom status. A summary score of 4 or higher (range, 0–15) indicated minor depressive symptoms (Shrout & Yager, 1989), and scores of 6 or higher indicated severe depressive symptoms (Bonomi, Kernic, Anderson, Cannon, & Slensick, 2008; Shrout & Yager, 1989).
- *Physical symptoms.* Using questions from the National Institute of Mental Health Diagnostic Interview Schedule, women indicated how frequently women were bothered by 14 common physical symptoms in the past 6 months (range, 1 = none of the time to 5 = all of the time) (Bonomi et al., 2006; Robins, Helzer, Croughan, & Ratcliff, 1981). A physical symptom was defined as present if women reported being bothered at least "some of the time" by the symptom.

Analysis

Chi-square tests and analysis of variance (ANOVA) methods were used to compare the demographic characteristics of women by childhood abuse history. Unadjusted means and frequencies were estimated for each of the health indicators across abuse exposure groups.

For our multivariate analysis: (1) generalized linear models with a log link were used to obtain prevalence ratios (PR) for each dichotomous health outcome for exposed compared to unexposed women; and (2) ordinary least squares regression was used to estimate mean differences in SF-36 subscale and Physical and Mental Component Summary scores. Two sets of multivariate models were run to compare the health of women with physical abuse only, sexual abuse only, or physical and sexual childhood abuse histories to the health of women without these histories (reference group). The first set of multivariate models controlled for age and income. Age could directly influence the relationship between child abuse exposure and adult health. In order to fit a parsimonious statistical model while still controlling for potential confounding, we chose to include one measure of socioeconomic status (income). There were no significant differences between groups for the three measures of SES (income, education, employment), so we adjusted for income. We did not adjust for race/ethnicity for two reasons. First, for non-biologic outcomes, race/ethnicity effects are often an artifact of a socioeconomic effect. Second, our sample did not afford a wide racial/ethnic distribution, with 82% Caucasian respondents.

The second set of models controlled for age, income and IPV—an exposure with a high degree of overlap with child abuse. We undertook the IPV-adjusted models to evaluate the effects of child abuse, above and beyond the health effects that may be due to IPV.

Results

Abuse types and sociodemographic differences

One third of the women ($n = 1,169$) in our sample reported a history of physical or sexual child abuse before age 18; 6.4% ($n = 229/3,568$) of the total sample experienced physical child abuse only, 19.4% (693/3,568) experienced sexual abuse only, and 6.9% (247/3,568) experienced both (Table 1). Of the 1,169 women with a child abuse history, 19.5% (229) reported physical abuse only, 59.2% (693) reported sexual abuse only, and 21.2% (247) reported both physical and sexual abuse. Significant group differences existed for women by abuse history for age, race, Hispanic ethnicity, and exposure to intimate partner violence since age 18.

Table 1
Characteristics of women by history of childhood abuse

	No childhood abuse ($n = 2,399$)	Physical abuse only ($n = 229$)	Sexual abuse only ($n = 693$)	Both physical and sexual abuse ($n = 247$)	Test statistic	*p*-Value
Age (%)						
18–24	12.2	9.2	5.3	4.5	$F = 7.78$	$p < .01$
25–34	10.8	7.0	9.2	13.8		
35–44	19.0	23.1	20.2	21.5		
45–54	31.1	36.2	35.4	39.3		
55–64	26.9	24.5	29.9	21.1		
Household income (%)						
<$25,000	12.3	14.4	9.9	12.3	$F = 1.96$	$p = .12$
$25,000–49,999	27.3	27.4	28.2	29.5		
$50,000–74,999	25.6	29.6	25.0	29.1		
≥$75,000	34.8	28.7	36.9	29.1		
Employed at least part time (%)	80.1	82.1	80.7	76.9	$\chi^2(3) = 2.28$	$p = .52$
Completed some college (%)	86.9	85.6	88.2	87.9	$\chi^2(3) = 1.42$	$p = .70$
Race[a] (%)						
White	82.3	76.9	85.0	76.9	$\chi^2(3) = 12.76$	$p < .01$
African-American	3.0	3.1	1.7	1.2		
Asian	6.9	5.7	2.6	2.4		
American Indian	2.8	5.7	3.8	7.3		
Multi-racial	2.8	5.2	4.1	5.7		
Other	2.2	3.5	2.9	6.5		
Hispanic (%)	3.2	5.2	5.8	6.5	$\chi^2(3) = 14.66$	$p < .01$
Have children in the home (%)	31.7	32.3	33.9	34.0	$\chi^2(3) = = 1.61$	$p = .66$
IPV reported in adulthood[b]	36.6	66.8	56.0	69.2	$\chi^2(3) = 204.27$	$p < .01$

SD, standard deviation; IPV, intimate partner violence.

[a] Test for % reporting white race vs. other race.

[b] Exposure to physical, sexual or non-physical IPV (threats, controlling behavior or positive Women's Experience with Battering scores) since age 18.

Table 2
Unadjusted means and frequencies of health indicators by child abuse history

	No childhood abuse (n = 2,399) Mean (SD)	Physical abuse only (n = 229) Mean (SD)	Sexual abuse only (n = 693) Mean (SD)	Both physical and sexual abuse (n = 247) Mean (SD)
SF-36 subscale scores				
Role emotional	50.3 (7.7)	47.1 (9.6)	48.6 (8.5)	46.9 (10.0)
Vitality	52.1 (9.0)	48.7 (10.0)	50.2 (9.5)	47.2 (11.0)
Mental health	52.8 (8.2)	49.0 (10.2)	50.6 (8.9)	48.0 (11.0)
Social functioning	50.6 (8.6)	47.2 (10.5)	48.8 (9.6)	44.9 (11.4)
Physical component summary	51.1 (8.9)	49.3 (9.5)	49.8 (9.7)	46.7 (11.9)
Mental component summary	51.6 (8.7)	48.3 (10.3)	49.8 (9.2)	47.6 (11.4)
Number of symptoms	2.1 (2.2)	2.8 (2.5)	2.8 (2.4)	3.6 (2.8)
	%	%	%	%
General health				
Fair/poor	7.4	10.0	9.5	15.8
Physical symptoms				
Joint pain in arms, legs, hands or feet	37.1	47.2	46.6	51.4
Back pain	29.3	33.6	36.4	45.8
Insomnia	25.4	33.2	34.9	42.9
Fatigue	15.2	27.5	22.1	31.6
Stomach ache or abdominal pain	15.2	21.4	20.5	23.9
Severe headache or migraine	16.6	19.2	18.0	24.7
Numb hands or feet	14.5	19.2	18.8	23.6
Diarrhea	12.0	14.9	18.9	21.1
Constipation	11.9	14.9	17.5	23.1
Shortness of breath	9.4	14.4	15.0	18.3
Facial ache or pain in jaw or ears	8.1	11.8	12.8	17.8
Dizziness	6.5	9.6	7.8	15.4
Nausea or vomiting	5.3	7.9	6.8	16.6
Chest pain	4.1	8.3	5.2	7.7
Depression, CES-D				
Depressive symptoms	17.1	28.8	21.4	38.2
Severely depressed	8.5	18.3	10.8	26.4

SF-36, Short Form-36 Health Survey; CES-D, Center for Epidemiological Studies-Depression scale; *SD*, standard deviation.

Adult health and child abuse history

Table 2 reports unadjusted mean SF-36 scores and frequencies of the dichotomous health indicators (prevalence of fair/poor health, physical symptoms and depressive symptoms) by child abuse history. Statistical comparisons of these *unadjusted* means and frequencies were not made in Table 2, as these statistical comparisons are most appropriately made in models that *adjust for important covariates* (Table 3 presents these statistical comparisons; please see section below).

Multivariate models of health and child abuse history

In models that adjusted for *age* and *income*, compared to women with no history of physical or sexual childhood abuse, the poorest health was observed in women with a history of both physical and sexual abuse (Table 3). Women with both abuse types had SF-36 scores ranging from 3.15 (emotional functioning) to 5.40 (social functioning) points lower than women without these abuse histories. Women with both abuse types also had a lower physical component score (PCS) (four points lower). Women with both abuse types had increased prevalence of self-reported fair/poor health (prevalence ratio, 1.84), each of the 14 physical symptoms (PR range, 1.33 for joint pain to 2.78 for nausea/vomiting), and symptoms of depression (prevalence ratio, 2.16) and severe depression (PR, 2.84).

Women with physical child abuse only or sexual child abuse only also had lower SF-36 subscale and physical and mental component summary scores than women without these abuse histories, but the score differences were not as large. Women with physical abuse only had increased prevalence of 7 of 14 physical symptoms (PR range, 1.20 for joint pain to 1.85 for chest pain), and depressive (PR, 1.60) and severe depressive (PR, 1.97) symptoms. Women with sexual abuse only had increased prevalence of 9 of 14 physical symptoms (PR range, 1.17 for joint pain to 1.55 for facial ache).

Adjusting for IPV exposure provided estimates of the association of childhood abuse with adult health status, above and beyond the association with subsequent IPV. Given the increased incidence of IPV among women abused as children and the adverse health effects of IPV, the estimated differences between childhood abuse exposure groups were not as strong when adjusting for IPV as those observed in the model that did not adjust for IPV. The lowest health status was again observed in

Table 3
Multivariate models of health by child abuse history

	Physical only vs. no abuse[a]	Sexual only vs. no abuse[a]	Physical and sexual vs. no abuse[a]	Physical only vs. no abuse[b]	Sexual only vs. no abuse[b]	Physical and sexual vs. no abuse[b]
	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)	B (95% CI)
SF-36 subscale scores						
Role emotional	−2.90 (−4.00, −1.80)	−1.76 (−2.44, −1.07)	−3.15 (−4.21, −2.10)	−2.13 (−3.23, −1.04)	−1.28 (−1.96, −0.59)	−2.32 (−3.37, −1.26)
Vitality	−3.05 (−4.32, −1.78)	−1.71 (−2.50, −0.91)	−4.53 (−5.75, −3.31)	−2.19 (−3.45, −0.93)	−1.17 (−1.96, −0.38)	−3.60 (−4.81, −2.38)
Mental health	−3.34 (−4.51, −2.17)	−2.09 (−2.83, −1.36)	−4.34 (−5.47, −3.22)	−2.46 (−3.62, −1.30)	−1.55 (−2.27, −0.82)	−3.39 (−4.52, −2.27)
Social functioning	−3.20 (−4.44, −1.96)	−1.71 (−2.49, −0.94)	−5.40 (−6.60, −4.21)	−2.38 (−3.62, −1.14)	−1.21 (−1.98, −0.43)	−4.52 (−5.71, −3.32)
Physical component summary	−1.65 (−2.89, −0.41)	−1.01 (−1.79, −0.23)	−4.17 (−5.36, −2.98)	−1.53 (−2.78, −0.28)	−0.93 (−1.72, −0.15)	−4.04 (−5.24, −2.83)
Mental component summary	−3.01 (−4.24, −1.78)	−1.81 (−2.59, −1.04)	−3.67 (−4.86, −2.49)	−2.03 (−3.26, −0.81)	−1.21 (−1.97, −0.44)	−2.62 (−3.79, −1.44)
	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)	PR (95% CI)
General health						
Fair/poor	1.25 (0.82, 1.89)	1.21 (0.92, 1.60)	1.84 (1.31, 2.58)	1.18 (0.77, 1.82)	1.17 (0.88, 1.55)	1.74 (1.23, 2.45)
Physical symptoms						
Joint pain in arms, legs, hands or feet	1.20 (1.04, 1.38)	1.17 (1.06, 1.28)	1.33 (1.17, 1.52)	1.16 (1.00, 1.33)	1.14 (1.04, 1.26)	1.29 (1.13, 1.47)
Back pain	1.09 (0.89, 1.33)	1.21 (1.07, 1.36)	1.52 (1.30, 1.78)	1.03 (0.84, 1.26)	1.16 (1.03, 1.31)	1.43 (1.22, 1.68)
Insomnia	1.28 (1.05, 1.56)	1.30 (1.15, 1.48)	1.63 (1.38, 1.92)	1.18 (0.97, 1.44)	1.23 (1.09, 1.40)	1.49 (1.26, 1.76)
Fatigue	1.74 (1.37, 2.19)	1.40 (1.18, 1.66)	1.94 (1.57, 2.40)	1.56 (1.23, 1.97)	1.30 (1.09, 1.55)	1.72 (1.39, 2.14)
Stomach ache or abdominal pain	1.43 (1.10, 1.86)	1.35 (1.13, 1.61)	1.49 (1.16, 1.92)	1.35 (1.03, 1.77)	1.30 (1.09, 1.56)	1.40 (1.09, 1.82)
Severe headache or migraine	1.18 (0.89, 1.56)	1.10 (0.91, 1.32)	1.43 (1.13, 1.81)	1.13 (0.86, 1.50)	1.07 (0.89, 1.29)	1.37 (1.08, 1.75)
Numb hands or feet	1.20 (0.89, 1.60)	1.19 (0.99, 1.44)	1.52 (1.19, 1.95)	1.16 (0.86, 1.57)	1.17 (0.97, 1.42)	1.48 (1.15, 1.91)
Diarrhea	1.19 (0.85, 1.66)	1.53 (1.27, 1.85)	1.59 (1.20, 2.09)	1.13 (0.81, 1.59)	1.49 (1.23, 1.81)	1.51 (1.14, 2.00)
Constipation	1.22 (0.87, 1.70)	1.38 (1.13, 1.69)	1.83 (1.41, 2.38)	1.17 (0.83, 1.63)	1.35 (1.10, 1.65)	1.75 (1.34, 2.28)
Shortness of breath	1.42 (1.00, 2.01)	1.51 (1.21, 1.88)	1.86 (1.39, 2.50)	1.28 (0.90, 1.83)	1.41 (1.13, 1.77)	1.68 (1.24, 2.26)
Facial ache or pain in jaw or ears	1.48 (1.01, 2.16)	1.55 (1.22, 1.98)	2.18 (1.62, 2.95)	1.30 (0.88, 1.91)	1.43 (1.12, 1.82)	1.90 (1.39, 2.61)
Dizziness	1.50 (0.98, 2.30)	1.18 (0.87, 1.60)	2.19 (1.55, 3.09)	1.41 (0.91, 2.18)	1.13 (0.83, 1.54)	2.04 (1.43, 2.89)
Nausea or vomiting	1.38 (0.85, 2.23)	1.33 (0.96, 1.84)	2.78 (1.96, 3.93)	1.30 (0.79, 2.12)	1.27 (0.91, 1.78)	2.61 (1.81, 3.75)
Chest pain	1.85 (1.14, 3.00)	1.22 (0.84, 1.79)	1.68 (1.03, 2.75)	1.72 (1.04, 2.85)	1.17 (0.79, 1.71)	1.56 (0.94, 2.58)
Depression, CES-D						
Depressive symptoms	1.60 (1.27, 2.02)	1.26 (1.06, 1.50)	2.16 (1.79, 2.60)	1.39 (1.10, 1.76)	1.14 (0.96, 1.36)	1.85 (1.53, 2.24)
Severely depressed	1.97 (1.44, 2.69)	1.26 (0.98, 1.63)	2.84 (2.20, 3.67)	1.68 (1.22, 2.32)	1.12 (0.87, 1.45)	2.40 (1.84, 3.12)

Statistical comparisons are interpreted using 95% confidence intervals, which represent the range within which the true magnitude of effect lies with a certain degree of confidence. For the SF-36 score comparisons, any confidence interval that does not include the value of "0" is a statistically significant difference, and for the binary outcomes, any confidence interval that does not include the value of "1" represents a statistically significant difference. SF-36 = Short Form-36 Health Survey; CES-D = Center for Epidemiological Studies-Depression scale; IPV = intimate partner violence; B = beta; PR = prevalence ratio; 95% CI = 95% confidence interval.

[a] Adjusted for age and income.
[b] Adjusted for age, income, and IPV.

women with both physical and sexual child abuse. Women with both abuse types had lower SF-36 scores (2.32–4.52 points lower), and increased prevalence of fair/poor health (PR, 1.74), 13 of 14 physical symptoms (PR range, 1.21 for joint pain to 2.61 nausea/vomiting), and depressive (PR, 1.85) and severe depressive (PR, 2.40) symptoms.

Discussion

Consistent with studies showing a graded relationship between adverse childhood exposures (including child abuse) and poor health in adulthood (Anda et al., 1999; Bensley et al., 2003; Felitti et al., 1998; Teicher et al., 2006), our study findings showed poorest health for women with a history of both physical and sexual child abuse. However, lower health status was also observed in women who had a history of physical abuse only or sexual abuse only compared to women without these abuse histories.

Women with a history of both physical and sexual abuse had increased prevalence in all 14 physical symptoms assessed in our study, and a more than twofold increase in the prevalence of depressive symptoms and a nearly threefold increase in severe depressive symptoms compared to women without these abuse histories. The depression findings are similar to the findings reported in a recent longitudinal follow-up of women and men with a history of childhood abuse, although their mean age at follow-up was only 28.7 years (Widom, DuMont, & Czaja, 2007). Our finding of lower SF-36 scores among women with abuse histories corroborate findings from other studies showing lower SF-36 scores for women with histories of childhood abuse (Dickinson, deGruy, Dickinson, & Candib, 1999; Edwards et al., 2003). Our finding that SF-36 scores were most compromised for women with both physical and sexual childhood abuse histories confirms the prior work of Edwards and colleagues (2003), which showed that SF-36 mental health scores varied in a dose–response manner with the number of abuse types experienced in childhood. The SF-36 mental and social functioning scores for women with a history of both physical and sexual abuse were comparable or lower than published scores for persons with chronic allergies, chronic back pain, diabetes and hypertension—chronic, debilitating conditions (Ware et al., 2000). Women with both physical and sexual abuse were also more likely than women without these abuse histories to report fair or poor health—an indicator that has been linked to use of medical services and hospitalization (Kravitz et al., 1992).

Our study improved on the methods of prior studies by examining the association between women's health and physical abuse, sexual abuse, and both physical and sexual abuse (in models that accounted for and did not account for intimate partner violence); including a population-based random sample drawn from the membership files of a large health plan (rather than sampling women presenting clinical services); and including a wide range of physical, mental and social health indicators. The child abuse questions were some of the last questions to be asked of women, after the questions on health and intimate partner violence. Due to the low response rate, we undertook a propensity score analysis to ensure that bias did not exist based on the likelihood of response to the survey.

There are several limitations of the study. First, we relied on self-reported child abuse history. Widom and colleagues (2007) suggest that reliance on retrospective self-reports of child abuse may cause ambiguity in results because of forgotten or non-disclosed abuse or effects of current distress on recollections of abuse. Others have noted poor agreement between autobiographical memories in adulthood and events reported in adolescence (Offer, Kaiz, Howard, & Bennett, 2000), and between prospective and retrospective reports of psychosocial factors such as family conflict (Henry, Moffitt, Caspi, Langley, & Silva, 1994). However, retrospective self-reports likely underestimate rather than overestimate child abuse (Dong et al., 2004; Hardt & Rutter, 2004; Widom et al., 2007). If women underreported child abuse, our findings would be conservative.

Second, due to the study's overarching focus on intimate partner violence and women's health, we included only two questions that assessed physical and sexual childhood abuse history. We did not inquire about other child abuse and maltreatment subtypes, severity or chronicity or perpetrator types as others have advocated (English, Bangdiwala, & Runyan, 2005; Manly, 2005). We therefore could not characterize the proportion of women who experienced psychological abuse or neglect, or evaluate whether these abuse types contributed to our findings. Non-physical abuse is independently associated with adverse health in adulthood (Johnson et al., 2001; Spertus, Yehuda, Wong, Halligan, & Seremetis, 2003; Teicher et al., 2006). Additionally, we did not have information about the perpetrator of sexual abuse. It is possible that the sexual abuse women experienced before age 18 occurred in dating relationships. This said, we showed that many women in our sample had experienced sexual abuse at age 12 or younger, suggesting that some of the abuse may not have been of dating nature.

Third, the nature of the sample itself—employed, highly educated and insured women—may contribute to problems of generalizability. Women in the sample were older, of higher income levels and more highly educated with 87.5% having at least some college education compared to 58.6% for the U.S. (U.S. Census Bureau, 2005). The study population was 82.6% White compared to 74.4% for the U.S. (U.S. Census Bureau, 2005).

These limitations notwithstanding, our study findings showed poor health in women with a child abuse history, particularly for women with a history of both physical and sexual abuse. Because of the common co-occurrence of multiple types of abuse in childhood and the cumulative effects of abuse on health (Anda et al., 1999; Dong, Anda, Dube, Giles, & Felitti, 2003; Felitti et al., 1998), some have advocated for an integrated approach for the study of child abuse (Dong et al., 2004). This would include study of overlap between types of childhood abuse, controlling for exposure to multiple childhood abuse exposures in health analyses, screening children and adults for multiple types of childhood abuse, and accounting for multiple types of childhood abuse in study of risk factors and designing interventions (Dong et al., 2004).

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