Child Abuse & Neglect

Long-term physical and mental health consequences of childhood physical abuse: Results from a large population-based sample of men and women[☆]

Kristen W. Springer [a,*], Jennifer Sheridan [b], Daphne Kuo [c], Molly Carnes [b,d,e]

[a] *Department of Sociology, Rutgers, The State University of New Jersey, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854, USA*
[b] *Women in Science and Engineering Leadership Institute (WISELI), University of Wisconsin, Madison, WI, USA*
[c] *University of Wisconsin Comprehensive Cancer Center, Madison, WI, USA*
[d] *Center for Women's Health Research, University of Wisconsin, Madison, WI, USA*
[e] *Geriatric Research Education and Clinical Center (GRECC), Madison, WI, USA*

Abstract

Objective: Child maltreatment has been linked to negative adult health outcomes; however, much past research includes only clinical samples of women, focuses exclusively on sexual abuse and/or fails to control for family background and childhood characteristics, both potential confounders. Further research is needed to obtain accurate, generalizable estimates and to educate clinicians who are generally unaware of the link between childhood abuse and adult health. The purpose of this project is to examine how childhood physical abuse by parents impacts mid-life mental and physical health, and to explore the attenuating effect of family background and childhood adversities. **Methods:** We analyzed population-based survey data from over 2,000 middle-aged men and women in the Wisconsin Longitudinal Study using self-reported measures of parental childhood physical abuse, mental health (depression, anxiety, anger), physical health (physical symptoms and medical diagnoses), family background, and childhood adversities.

Results: Parental physical abuse was reported by 11.4% of respondents (10.6% of males and 12.1% of females). In multivariate models controlling for age, sex, childhood adversities, and family background, we found that childhood physical abuse predicted a graded increase in depression, anxiety, anger, physical symptoms, and medical diagnoses. Childhood physical abuse also predicted severe ill health and an array of specific medical diagnoses and physical symptoms. Family background and childhood adversities attenuated but did not eliminate the childhood abuse/adult health relationship.

Conclusions: In a population-based cohort of middle-aged men and women, childhood physical abuse predicted worse mental and physical health decades after the abuse. These effects were attenuated, but not eliminated, by age, sex, family background, and childhood adversities.

Introduction

Childhood maltreatment has been associated with an array of psychological and somatic symptoms in adult life (McCauley et al., 1997; Moeller & Bachman, 1993; Mullen, Romans-Clarkson, Walton, & Herbison, 1988; Walker et al., 1999) as well as psychiatric diagnoses including depression (Wise, Zierier, Krieger, & Harlow, 2001), anxiety disorders (MacMillan et al., 2001), eating disorders (Kendler et al., 2000), and post-traumatic stress disorder (Widom, 1999). In addition, research has documented that the combination of multiple types of maltreatment are associated with increased health problems (Felitti et al., 1998). Medical diagnoses associated with childhood maltreatment are primarily syndromes characterized by pain and disability in the absence of firm physical or laboratory abnormalities (Katon, Sullivan, & Walker, 2001) including chronic pain syndromes (Walling et al., 1994), headaches (Goodwin, Hoven, Murison, & Hotopf, 2003), fibromyalgia (Boisset-Pioro, Esdaile, & Fitzcharles, 1995), chronic fatigue syndrome (Taylor & Janson, 2002), and irritable bowel syndrome (Drossman et al., 1990). Despite this strong evidence, many recent reviews in the medical literature have failed to acknowledge childhood maltreatment as an important predictor of adult health problems (Barsky & Borus, 1999; Leventhal, 1999; Mehler, 2001; Whooley & Simon, 2000).

Research has established relationships between multiple forms of childhood maltreatment and adult health (Springer, Sheridan, Kuo, & Carnes, 2003). However, most of the existing research emphasizes childhood sexual abuse and/or childhood abuse among girls despite the fact that childhood physical abuse is more prevalent than sexual abuse and childhood physical abuse is more likely than sexual abuse to occur in both men and women (US Department of Health and Human Services, 2002, 2006). In addition, much of the previous research has been conducted on small and/or clinical samples. While these studies are informative, sample selection issues limit the generalizability of the findings.

Furthermore, not all previous studies of childhood physical abuse and adult health have controlled for family background and early childhood adversity variables—potentially important confounders. Childhood physical abuse is seldom an isolated event and only when these other factors are accounted for can one confidently argue about a health effect of childhood physical abuse *above and beyond* other adversities in family environment. Most of the research that includes multiple childhood adversities and/or family background use the Adverse Childhood Experiences (ACE) study and examine the combined effect of multiple adversities rather than analyzing the effect of each adversity individually (Anda et al., 1999;

Dong, Dube, Felitti, Giles, & Anda, 2003; Felitti et al., 1998; Hillis, Anda, Felitti, & Marchbanks, 2001). While these projects are important in emphasizing the cumulative effect of abuse, it is also essential to understand how *specific* types of abuse impact adult health net of other childhood adversities and family background.

Therefore, the purpose of the current project is to explore how one specific type of child maltreatment—childhood physical abuse—affects different aspects of adult health in a population-based sample of men and women. To isolate the effects of childhood physical abuse, we account for a variety of family background and childhood adversity measures to rule out the possibility of a spurious association between childhood physical abuse and adult health problems.

Methods

Study population

Data for this project are from the sibling respondents of the Wisconsin Longitudinal Study (WLS). The WLS is a long-term population-based study of men and women who graduated in 1957 from Wisconsin high schools and their siblings (Sewell, Hauser, Springer, & Hauser, 2003). The sibling respondents (hereafter respondents) were interviewed in 1977 and 1994. The 1994 round of data collection consisted of a 1-hour telephone interview followed by a 20-page mail survey. Data collection in 1977 focused on education, occupation, and family demographics whereas data collection in 1994 focused on health, well-being and aging, in addition to education, occupation, and family. The variables for these current analyses are from the 1994 survey with the exception of family background characteristics from the 1977 survey.

Reflecting the 1957 Wisconsin population, the WLS cohort is almost entirely white of non-Hispanic origin. Although the sample originated in Wisconsin, the 1977 and 1994 interviews were conducted with respondents across the U.S. The WLS is approved by the University of Wisconsin IRB; these secondary analyses were exempted from additional human subjects approval.

Measurement

Childhood physical abuse. The 1994 mail survey included questions on childhood physical abuse based on the Conflict Tactics Scale (Straus, Gelles, & Steinmetz, 1981). Respondents were asked separate questions about whether their mothers or fathers "slapped, shoved, or threw things at them" before age 17. The response categories were "a lot," "some," "a little," or "not at all" scaled from 3 ("a lot") to 0 ("not at all"). Those who reported "some" or "a lot" of abuse by either or both parents as opposed to "a little" or "not at all" were classified as having experienced childhood physical abuse.

Mental health. Depression was assessed with the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977); anxiety and anger were assessed with the Spielberger's Anxiety and Anger scales (Spielberger, 1996; Spielberger & Gorsuch, 1983; Spielberger, Sydeman, Owen, & Marsh, 1999). The anxiety and anger scales included 10 items each whereas the CES-D included 20 items. Each of the items assessed how many days in the past week respondents experienced a specific symptom. Respondents

who completed all anxiety and anger items were included in the analyses whereas respondents were included in the depression analyses if they answered at least 10 of the 20 items. To construct each of these scales we divided the total score by the number of items answered, multiplied this value by the number of items in the scale, and rounded this score.

Physical health. Using a modified version of the Duke Older Adults Research Survey (OARS) (Duke University Center for the Study of Aging and Human Development, 1978) respondents were asked whether "a medical professional has ever said you have . . .," followed by the following list of 17 conditions: allergies, anemia, arthritis/rheumatism, asthma, serious back trouble, bronchitis/emphysema, cancer, circulation problems, colitis, diabetes, heart trouble, high blood pressure, high cholesterol, kidney/bladder problems, chronic liver trouble, multiple sclerosis, and ulcer. From a symptoms list created for the WLS, respondents reported whether or not they had experienced any of a list of 27 physical symptoms in the past 6 months and how often. For this analysis, a respondent was coded as having a symptom if s/he reported experiencing it once a week or more often in the last 6 months.

Family background characteristics. Six indicators of family background were used: mother's education (years), father's education (years), parental income (log transformed), father's occupational standing (occupational education scores [Hauser & Warren, 1997]), number of siblings, and farm background. When direct reports were not available because of the sampling design or missing data, reports from the graduate sibling were used if they lived together most of their childhood.

Childhood adversity. Four indicators of childhood adversity were used: whether the respondents grew up with a problem drinker (parental drinking problem), whether their parents had serious marital problems when they were growing up (parental marital problem), whether their parents slapped, shoved or threw things at each other some or a lot of the time (parental violence), and whether respondents did not grow up with both parents until 16 years old (broken family). For this cohort, growing up without both parents was most often the result of widowhood.

Sample selection

There were 6,260 siblings approached to participate in the 1994 telephone interview and 4,804 (77%) completed the interview. Of these respondents, 3,501 also completed the mail survey, yielding a 73% response rate for the mail instrument. This project utilizes two samples—one sample controls for a vast array of family background and childhood adversity characteristics and the second sample employs a more streamlined set of controls, as described in the statistical analysis section. The sample containing all controls contains approximately 2,050 cases and the second sample contains approximately 2,800 cases. The decrease from 3,501 to 2,800 cases is largely because many of the family background questions were only asked of a smaller sample of siblings interviewed in 1977. The decrease from 2,800 to 2,051 cases is largely because the question about parental drinking problems was asked of an 80% random subsample of the phone interviews. Almost all of the missing data are due to random subsampling and therefore pose no threat to the validity of the analyses.

Statistical analysis

Bivariate comparisons of demographic and health measures for abused and nonabused participants were performed individually by one-sided *t* tests because we hypothesized *increased* problems associated with childhood physical abuse. For multivariate models, three types of dependent variables were constructed to assess different dimensions of the childhood abuse/adult health relationship. First, natural log transformed counts of the medical diagnoses and physical symptoms and the total scores of the depression, anxiety, and anger scales were analyzed. Second, nontransformed outcomes cut at the 90th percentile were used to examine extreme ill health. For example, we created a dummy variable indicating whether someone reported more symptoms than 90% of the sample. Third, each medical condition and cluster of physical symptoms by organ system was assessed. Here each organ system grouping was coded as 1 if a person reported any of the symptoms in the group.

Logistic regression was used for dichotomous outcomes with coefficients indicating the increased or decreased odds of the outcome for each independent variable. Ordinary least square (OLS) regression was used to analyze scales of depression, anxiety, anger, number of symptoms, and number of diagnoses. Outcome variables in these OLS analyses were transformed with a natural log to reduce the skew of the dependent variable and to correct for violations of the normal residual distribution assumption. Because the outcomes were log transformed, the effect of the independent variables can be understood best by exponentiating the coefficients [%change in $y = 100 \times (\exp[B] - 1)$] to obtain a value interpretable as a percent change in the outcome.

OLS models began with reduced-form regressions of health measures on childhood abuse to obtain the total effects of abuse on each health outcome. Controls for age and sex, family background, and childhood adversity were then sequentially added resulting in a sample of 2,051 cases with complete data medical diagnoses and all controls.

Because most of the family background and childhood adversity measures were correlated and were not significant, a set of the most efficient measures was chosen for models in Tables 3 and 4 using Multiple Indicator and Multiple Cause (MIMIC) models. Examining only these efficient measures (father's education, farm background, and parental marital problems in childhood) resulted in an increase of approximately 750 cases for a total sample size of 2,836 (results available on request).

Results

Descriptive statistics

Descriptive statistics for the sample with complete data on all independent variables and number of illnesses ($N = 2,051$) are shown in Table 1. Childhood physical abuse was reported by 11.4% of respondents. Over half of the respondents were women, and the mean age of 55 years was similar for abused and nonabused respondents. Abused respondents had fathers with significantly less education and significantly lower occupational education. In addition, abused respondents had significantly more siblings, were more likely to grow up with problem drinkers, more likely to report having parents with serious marital problems, and more likely to report violence between parents than nonabused respondents. Abused respondents reported worse health than nonabused respondents for all five health scales.

Table 1
Sample characteristics

	Abused (*N* = 234)		Nonabused (*N* = 1,817)		*t* test
	Mean	*SD*	Mean	*SD*	
Percent abused	11.4		0.0		
Demographic characteristics and background					
Percent female	55.6		51.9		
Age (years)	55.0	5.6	55.0	6.1	
Father's education (years)	9.5	3.3	9.9	3.3	$p < .05$
Mother's education (years)	10.4	2.6	10.5	2.8	
Parental income (dollars)[a]	5,112.7	3,181.3	5,338.9	3,744.2	
Percent farm background	18.8		20.4		
Father's occupational education[b]	14.6		18.2		$p < .01$
Number of siblings	3.3	2.1	3.1	2.0	$p < .05$
Percent broken family	3.0		2.6		
Percent parental drinking problems	35.9		16.6		$p < .01$
Percent parental marital problems	43.6		14.0		$p < .01$
Percent parental violence	32.1		3.0		$p < .01$
Outcome variables					
Number of medical diagnoses	2.7	2.1	2.2	2.0	$p < .01$
Number of physical symptoms	3.6	3.6	2.8	3.1	$p < .01$
Depression (CES-D)	21.0	19.9	15.8	14.1	$p < .01$
Anxiety	15.6	13.8	12.7	11.0	$p < .01$
Anger	9.3	10.7	7.0	8.0	$p < .01$

[a] Parental income is reverse transformed from the mean and *SD* of the logged score.
[b] Occupational education is the percentage of persons in the 1970 Census in an occupation/industry/class-of-worker category who completed one year of college or more. In the model this has been transformed per Hauser and Warren's (1997) article. The values in the table are obtained from a reverse transformation of the mean and *SD* of the logged score.

Child physical abuse, health outcomes, and family background effects

The first three columns of Table 2 contain the zero-order OLS models, which show the total effect of abuse on all five health outcome scales. The second three columns contain models controlling only for sex and age, and the last three columns control for sex, age, and all childhood adversities. Only significant effects are presented in Table 2.

In all of the models childhood physical abuse significantly predicted an increase in negative health. In the zero-order model, physical abuse was associated with a .19 increase in the natural log of the number of medical diagnoses. The coefficient .19 can be transformed into a percent change by exponentiation: %change in $y = 100 \times [\exp(B) - 1] = 100 \times [\exp(.19) - 1] = 21\%$. Therefore, the results in Table 2 demonstrate that physical abuse is associated with a 21% increase in medical diagnoses, 22% increase in the number of physical symptoms, 24% increase in depression, 27% increase in anger, and a 23% increase in anxiety. After controlling for sex and age, the effect of abuse is slightly, but not substantially, attenuated.

Controlling for all family background and childhood adversity variables (the last three columns), the effect of physical abuse on all of the outcomes is attenuated but remains significant at the .05 level and

Table 2
Childhood physical abuse, health outcomes, and family background effects

	OLS (transformed scores)[a]								
	(1) Zero order			(2) Sex and age model			(3) Full control		
	Coefficient	SE	%Δ	Coefficient	SE	%Δ	Coefficient	SE	%Δ
Number of medical diagnoses (N = 2,051)									
Abuse	.19	.04	21[**]	.19	.04	21[**]	.14	.05	15[**]
Sex				.18	.03	20[**]	.17	.03	19[**]
Age				.02	.00	2[**]	.02	.00	2[**]
Farm background							−.10	.04	−9[**]
Parental marital problems							.12	.04	12[**]
Number of physical symptoms (N = 2,046)									
Abuse	.20	.06	22[**]	.19	.06	21[**]	.15	.06	16[*]
Sex				.21	.04	24[**]	.20	.04	23[**]
Father's education							−.01	.01	−1[*]
Farm background							−.10	.05	−9[*]
Depression (CES-D) (N = 2,035)									
Abuse	.22	.07	24[**]	.21	.07	23[**]	.18	.08	19[*]
Sex				.20	.04	22[**]	.19	.04	21[**]
Age				−.02	.00	−2[**]	−.02	.00	−2[**]
Anger (N = 2,033)									
Abuse	.24	.07	27[**]	.24	.07	27[**]	.20	.08	22[**]
Age				−.04	.00	−4[**]	−.04	.00	−4[**]
Anxiety (N = 2,031)									
Abuse	.21	.07	23[**]	.20	.07	22[**]	.19	.08	21[*]
Sex				.38	.04	47[**]	.37	.05	45[**]
Age				−.03	.00	−3[**]	−.03	.00	−3[**]
Father's education							−.02	.01	−2[*]

[a] The OLS regression also includes a constant term. All models control for age, sex, father's education, mother's education, parental income, farm background, father's occupational education, number of siblings, broken family, parental drinking problems, parental marital problems, and parental violence. Only significant coefficients are presented in the table.
[*] Significant at .05 level.
[**] Significant at .01 level.

significant at the .01 level for medical diagnoses and anger. Net of sex, age, all family background variables and all childhood adversity variables, childhood physical abuse is significantly associated with a 15% increase in medical diagnoses, a 16% increase in medical symptoms, a 19% increase in depression, a 22% increase in anger, and a 21% increase in anxiety. It should be noted that most of the family background variables were not significant.

OLS results using the larger sample with the trimmed set of family background and childhood adversity variables were very similar to results presented in Table 2. Specifically, these analyses demonstrate that respondents who were physically abused in childhood are significantly less healthy for all outcomes regardless of sex, age, family background, and childhood adversities (results available upon request).

Table 3
Childhood physical abuse and extreme ill health[a]

	O.R.	C.I. (95%)
Number of medical diagnoses (N = 2,836)		
Abuse	1.84	(1.23, 2.75)[**]
Sex	1.82	(1.32, 2.51)[**]
Age	1.06	(1.04, 1.09)[**]
Father's education	1.00	(.95, 1.05)
Farm background	.75	(.49, 1.15)
Parental marital problems	1.38	(.95, 2.00)
Number of physical symptoms (N = 2,830)		
Abuse	1.32	(.90, 1.93)
Sex	1.37	(1.04, 1.80)[*]
Age	.99	(.97, 1.01)
Father's education	.95	(.91, .99)[*]
Farm background	.93	(.65, 1.31)
Parental marital problems	1.42	(1.02, 1.97)[*]
Depression (CES-D) (N = 2,813)		
Abuse	1.61	(1.15, 2.27)[**]
Sex	1.35	(1.05, 1.74)[*]
Age	.96	(.94, .98)[**]
Father's education	.96	(.92, 1.00)[*]
Farm background	.96	(.69, 1.33)
Parental marital problems	1.66	(1.23, 2.24)[**]
Anger (N = 2,813)		
Abuse	2.02	(1.44, 2.84)[**]
Sex	.98	(.76, 1.26)
Age	.93	(.91, .95)[**]
Father's education	1.00	(.97, 1.04)
Farm background	.73	(.51, 1.04)
Parental marital problems	1.11	(.81, 1.53)
Anxiety (N = 2,812)		
Abuse	1.78	(1.27, 2.50)[**]
Sex	1.65	(1.28, 2.12)[**]
Age	.94	(.93, .96)[**]
Father's education	.98	(.94, 1.02)
Farm background	.87	(.63, 1.21)
Parental marital problems	.96	(.70, 1.33)

[a] More health problems than 90% of the sample.
[*] Significant at .05 level.
[**] Significant at .01 level.

Childhood physical abuse and extreme ill health

Table 3 shows the logistic regression models for each health outcome scale assessed at the 90th percentile. These results indicate that childhood physical abuse is associated with extreme ill health for medical diagnoses, depression, anger and anxiety, yet not physical symptoms after con-

trolling for sex, age, and the trimmed set of family background and childhood adversity variables. Specifically, childhood physical abuse is associated with an 84% increase in the odds of having more medical diagnoses than 90% of the sample, a 61% increase in the odds of reporting more depression than 90% of the sample, a 102% increase in the odds of reporting more anger than 90% of the sample, and 78% increase in the odds of reporting more anxiety than 90% of the sample.

Specific medical diagnoses and physical symptoms by organ system

Table 4 shows the influence of childhood physical abuse on individual diagnoses and physical symptoms grouped by organ system controlling for sex, age, and the trimmed set of family background and childhood adversity measures. For respondents who were abused in childhood, the odds of having allergies, arthritis/rheumatism, asthma, bronchitis/emphysema, circulation problems, high blood pressure, heart troubles, liver troubles, and ulcers was 34–167% higher than for those who were not physically abused in childhood after controlling for sex, age, family background, and childhood adversity variables. Self-reported physical abuse in childhood was also associated with cardiopulmonary, constitutional, and musculoskeletal physical symptoms at the .05 level.

Table 4
The effect of childhood physical abuse on medical diagnoses and physical symptoms by organ system[a]

	O.R.	C.I. (95%)
Medical diagnoses		
Allergy	1.38	(1.06, 1.78)[*]
Arthritis/rheumatism	1.34	(1.05, 1.72)[*]
Asthma	1.64	(1.09, 2.47)[*]
Bronchitis/emphysema	1.49	(1.09, 2.03)[*]
Circulation problems	1.47	(1.01, 2.15)[*]
High blood pressure	1.43	(1.10, 1.85)[**]
Heart troubles	1.50	(1.03, 2.17)[*]
Liver troubles	2.67	(1.09, 6.55)[*]
Ulcer	1.84	(1.29, 2.62)[**]
Physical symptoms by organ system		
Cardiopulmonary symptoms[b]	1.42	(1.06, 1.89)[*]
Constitutional symptoms[c]	1.33	(1.05, 1.69)[*]
Musculoskeletal symptoms[d]	1.29	(1.02, 1.63)[*]

[a] O.R. are adjusted odds ratios, controlling for sex, age, father's education, farm background, and parental marital problems. Only significant outcomes are included in the table.
[b] Chest pain, shortness of breath, respiratory problems, coughing/wheezing, and palpitations.
[c] Lack of energy, trouble sleeping, fatigue/exhaustion, and excessive sweating.
[d] Aching muscles, back pain/strain, stiff/swollen joints, skin problems, and bone pains.
[*] Significant at .05 level.
[**] Significant at .01 level.

Discussion

Self-reported physical abuse in childhood increased the likelihood of reporting more diagnosed illnesses, physical symptoms, anxiety, anger, and depression nearly 40 years after the abuse took place. Childhood physical abuse was associated with decreases in mental and physical health, having worse health than 90% of the sample, and an array of specific diagnoses and symptoms by system after adjusting for sex, age, family background, and childhood adversities. The results showed that controlling for childhood adversities and family background was necessary to attain an accurate estimate of the impact of abuse on mid-life health.

Much of the past research examining the effects of childhood physical abuse on adult health collapses its effects with childhood sexual abuse (Dong et al., 2003; Felitti et al., 1998; McCauley et al., 1997; McNutt, Carlson, Persaud, & Postmus, 2002; Walker et al., 1999). These projects highlight that childhood physical abuse often does not occur alone and that experiencing multiple abuses increases adult health risks. However, it is also essential to understand how *specific* types of abuse impact adult health—taking into account other childhood adversities.

Prior literature has examined the medical impact of physical abuse in childhood; however, most of this literature has not accounted for other childhood adversities. For example, Shaw and Krause (2002) found that physical abuse predicted more chronic medical conditions and more depression in adulthood, but they did not control for family background or other childhood adversities. Thompson, Arias, Basile, and Desai (2002), however is one example of research that did control for childhood adversities. Specifically, they examined data from the National Violence Against Women Survey and found that childhood physical victimization was associated with lower perceived general health, chronic mental health conditions, the occurrence of injury, and alcohol and drug use after controlling childhood sexual abuse and several adult-aged mediators (Thompson et al., 2002).

Evidence such as that found in the current study linking abuse in childhood with the long-term development of specific medical diagnoses is essential because it can begin to show the mechanisms through which childhood maltreatment influences adult health (Felitti et al., 1998; Goodwin et al., 2003; Shaw & Krause, 2002; Stein & Barrett-Connor, 2000; Walker et al., 1999). Medical diagnoses results are particularly compelling when multiple studies with diverse samples and different abuse questions produce similar findings. For example, both the current project and Shaw and Krause (2002) found that heart trouble but not diabetes or cancer was significantly greater in survivors of childhood physical abuse. Goodwin et al. (2003) examined the same cohort studied by Shaw and Krause (2002) and found that childhood physical abuse was associated with recurring stomach problems and ulcers—results consistent with the current findings of ulcer diagnoses. However, unlike Shaw and Krause (2002), the current results indicate that hypertension was greater among those who reported childhood physical abuse.

The association of childhood physical abuse with adult psychiatric morbidity in this study is also consistent with the findings of others, although this is the first project we know of to provide an assessment of how anger is affected by childhood maltreatment in a population-based sample (MacMillan et al., 2001). The novel finding of increased anger in adults reporting childhood physical abuse could point to an additional mechanism through which childhood abuse might have an impact on adult physical health outcomes.

After controlling for an extensive array of family background and childhood adversity measures the effect of abuse on adult health outcomes generally was attenuated but not eliminated. This finding suggests that the strength of the relationship between abuse and health outcomes in previous studies that did not

control for these confounders might not be as strong as reported. Future research aiming to obtain accurate estimates of the relationship between childhood physical abuse and adult health must control for additional childhood characteristics. Results suggest that controlling for one or few childhood adversity variables (such as parental marital problems) might be more efficient than including multiple variables.

Even though childhood abuse meets a number of epidemiological criteria for a causal relationship between an exposure and an outcome (Springer et al., 2003), acknowledgment of childhood abuse as a risk factor for conditions commonly managed by internists is surprisingly rare in the medical literature (Barsky & Borus, 1999; Carnes, Sarto, & Springer, 2001; Leventhal, 1999; Mehler, 2001; Sharpe & Carson, 2001; US Department of Health and Human Services, 1993; Whooley & Simon, 2000). Such omissions underscore the urgency of reporting about childhood abuse in the medical literature as well as the importance of continuing research on the relationship between maltreatment and adult health conditions.

Though the current study has many strengths, it shares several weaknesses common to studies of childhood abuse and adult health. First, despite the longitudinal nature of the WLS, the abuse and health data are cross-sectional. We hypothesize that abuse increases the number of health problems, but we cannot rule out the possibility that the presence of ill health may have enhanced recall of abuse. Most studies suggest an under-reporting of abuse, however, so those who do report abuse in childhood are likely to actually have had this experience (Fergusson, Horwood, & Woodward, 2000).

Second, mood congruency bias may be a potential problem; this may occur, for example, if depressed individuals "selectively recall negative experiences and hence may exaggerate or misrepresent the presence of childhood adversity" (Brewin, Andrews, & Gotlib, 1993). Though some research suggests this is a problem (Lewinsohn & Rosenbaum, 1987) many others have found no evidence of this bias (Brewin et al., 1993; Fergusson et al., 2000; Maughan, Pickles, & Quinton, 1995; Robins et al., 1985). Sensitivity tests controlling for depression in the current models predicting medical diagnoses suggest that mood congruency bias is not a serious concern (results available upon request).

A third limitation of these analyses is that we did not control for other specific types of childhood abuse including sexual abuse and emotional abuse. However, the WLS contains a variety of childhood adversities that often co-occur with childhood sexual, emotional, and physical abuse. By controlling for these childhood adversities we may have statistically accounted for much of the common negative environment associated with childhood sexual and emotional abuse.

Fourth, we do not account for adult violence. Research has robustly demonstrated that violence in childhood is associated with violence in adulthood—especially for women (Kendall-Tackett, 2003). Therefore, it is possible that our findings of increased adverse health problems are due to domestic violence, rather than childhood violence. However, sensitivity tests do not suggest this is a strong possibility (results available up request).

Finally, there are limitations with our measure of childhood physical abuse. The current measure draws from only two items, and, therefore, its reliability may be weak. Though only two items were used, they have performed well in previous studies (Shaw & Krause, 2002) and are from a well-validated and often-used scale (Straus et al., 1981). However, future research should include additional measures from the Conflict Tactics Scale.

The results in this project point to several areas for future research. Other projects would do well to examine how the long-term health effect of abuse may differ for childhood sexual abuse and childhood emotional abuse. Scholars could also examine what factors in childhood are protective and serve to enhance survivors' resiliency. Finally, future research should examine potential mechanisms linking

childhood physical abuse with adult health. Exploring health behaviors as a potential pathway might be particularly fruitful given extant literature demonstrating that childhood abuse is associated with negative health behaviors. For example, clinical studies examining health behaviors as outcomes suggest a relationship between childhood abuse and smoking (Anda et al., 1999), drinking (Dong et al., 2003), high-risk sexual activities (Hillis et al., 2001), and obesity (Williamson, Thompson, Anda, Dietz, & Felitti, 2002). It would also be useful to examine mental health as one potential mechanism through which childhood abuse adversely impacts adult physical health.

In conclusion, this study demonstrates that self-reported physical abuse in childhood is associated with poor mental and physical health, including chronic medical conditions, even decades after the abuse. This association was attenuated but generally persisted when controlling for family background and childhood adversity variables. Despite the personal and health care burden associated with the long-term effects of childhood abuse and the availability of effective interventions, recognition of this link appears to be underemphasized in medical teaching and practice.

Acknowledgments

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