

Health Care Use of Children Whose Female Caregivers Have Intimate Partner Violence Histories

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Objective: To determine whether prior exposure to intimate partner violence (IPV) is associated with children's subsequent emergency department (ED) visits and hospitalizations.

Design: Retrospective cohort study.

Setting: The National Survey of Child and Adolescent Well-Being, a nationally representative sample of children reported to Child Protective Services between 1999 and 2000.

Participants: Families of children reported to Child Protective Services who were assessed through comprehensive caregiver interviews at baseline and 18 and 36 months.

Main Exposure: Severe or minor IPV, as measured by the Conflict Tactics Scale 1.

Main Outcome Measures: Number of ED visits or hospitalizations from baseline to the 18-month assessment

(interval 1, n=2689) and from the 18-month to the 36-month assessment (interval 2, n=2546).

Results: Compared with children whose female caregivers reported no IPV at baseline, children whose female caregivers disclosed severe IPV at baseline had significantly higher rates of ED visits over both subsequent intervals (interval 1, incidence rate ratio [IRR], 2.0; 95% confidence interval [CI], 1.3-2.9; interval 2, IRR, 1.9; 95% CI, 1.2-3.0). In contrast, rates of hospitalizations were lower in the second interval for children whose female caregivers disclosed minor IPV as compared with no IPV at baseline (IRR, 0.2; 95% CI, 0.1-0.6).

Conclusions: Further research is required to elucidate the complex relationship between IPV and child health care use. Such an understanding will facilitate identification of sites within the health care system where effective interventions for children exposed to IPV, and their caregivers, might be located.

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EACH YEAR IN THE UNITED States, between 3.3 and 10 million children are exposed to intimate partner violence (IPV).^{1,2} In 1998, the American Academy of Pediatrics acknowledged this problem, publishing guidelines detailing the role of the pediatrician in detecting IPV and helping abused women.³ Although the American Academy of Pediatrics stated "the abuse of women is a pediatric issue,"^{3(p1091)} a recent systematic review concluded that the effects of IPV on children's physical health and health service use have not been fully characterized, both because of a paucity of research as well as methodological limitations in existing studies.⁴

Several studies, however, have investigated the association between IPV and child health services use.⁵⁻⁹ Rivara and colleagues,⁸ for example, demonstrated that both health care use and costs were higher

for children exposed to IPV, as compared with children not exposed, with the most significant effects on children's use of mental health services, primary care visits and costs, and laboratory costs. In this study, children whose mothers had IPV that ended before the child's birth also had increased health service use. Casanueva and colleagues⁹ conducted a cross-sectional study using data from the National Survey of Child and Adolescent Well-Being (NSCAW), a longitudinal study of families reported to Child Protective Services (CPS), to determine the relationship between IPV and emergency department (ED) use. Based on data from baseline interviews, which were conducted at entry into the NSCAW cohort, they found that prior severe IPV was related to children's prior ED visits. Left unanswered, however, is the question of whether the association between IPV and increased child health care use persisted over time.

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Beyond its immediate influence, as suggested by the work of Rivara et al,⁸ IPV could have sustained effects on children's health and health care use. Women who were formerly abused are more likely than nonabused women to have persistent anxiety, depression, and trauma.¹⁰⁻¹⁴ This in turn may translate into increased health care use for children for a number of reasons, including hypervigilance and misinterpretation of symptoms,¹⁰ associated family disorganization with limited ability to manage children's illnesses,^{10,14} or an underlying maternal desire to seek help. Alternatively, increased child health service use over time might reflect higher rates of actual health problems, stemming from the stress of prior IPV exposure.¹⁵

We therefore sought to test whether IPV has a lingering effect on child health care use by conducting a retrospective cohort study drawing on the longitudinal design of NSCAW. Specifically, our objective was to determine the relationship between a baseline report of IPV from female caregivers and children's subsequent ED use and hospitalizations over the entire 36-month study period.

METHODS

All study procedures for the original NSCAW were approved by the institutional review board of the Research Triangle Institute and by the institutional review boards of relevant state and local agencies. Prior to beginning data collection in the parent study, caregivers provided written informed consent. The current secondary data analysis also was approved by our institutions' committees for the Protection of Human Subjects.

STUDY PARTICIPANTS AND DESIGN

NSCAW is a nationally representative longitudinal cohort study designed to collect information over a 3-year period on families referred to CPS.¹⁶ A cohort of 5501 children was recruited between October 1, 1999, and December 31, 2000, following a report for suspected child maltreatment. Both families whose cases were substantiated and those whose cases were unsubstantiated were included in the sample.

Sampling involved a complex, clustered survey design. Further details of the survey procedures are available elsewhere.¹⁷ Briefly, for the parent study, children were not eligible if they were (1) members of the same family of a previously selected child (1 index child per family); (2) 15 years or older; or (3) being investigated as a potential perpetrator.¹⁶

Caregivers of sampled children were interviewed in their homes at entry into the cohort and then at 18 and 36 months following entry. Interviews involved questions about the sampled child's and primary caregiver's health and well-being and about the home environment. Sensitive questions, including those about IPV, were self-administered via computer.

SELECTION CRITERIA

In the current study, children were excluded from contributing data if (1) they were in out-of-home care or (2) the primary caregiver was male. These exclusion criteria were applied because IPV data were not collected in the NSCAW in these situations.

MEASURES

Intimate Partner Violence

Intimate partner violence was assessed using the Conflict Tactics Scale 1 Partner-Partner Physical Violence Scale, one of the

No matter how well a couple gets along, there are times when they have fights. Thinking back over the **last 12 months**, how many times has a partner of yours:

1. Thrown something at you?
2. Pushed, grabbed or shoved you?
3. Slapped you?
4. Kicked, bit, or hit you with a fist?
5. Hit or tried to hit you with something?
6. Beat you up?
7. Choked you?
8. Threatened you with a knife or gun?
9. Used a knife or fired a gun on you?

Figure. Conflict Tactics Scale 1 Physical Violence Scale.¹⁸ Items 1 to 3 are considered to be minor violence, while items 4 to 9 are considered severe violence.

most widely used and validated measures of family violence.¹⁸ The Conflict Tactics Scale 1 Physical Violence Scale assesses aggressive behaviors used by an intimate partner in response to relationship conflict and asks respondents to determine how many times in the past 12 months an intimate partner has used each violent act against the respondent.¹⁸ The acts of aggression can be divided into those considered to be "minor violence," such as pushing, and those considered to be "severe violence," such as using a knife or gun (**Figure**).¹⁸ Cronbach α coefficients for the Conflict Tactics Scale Husband to Wife Physical Aggression Scale are excellent, ranging from 0.79 to 0.91. Good construct validity also has been demonstrated.¹⁸

Intimate partner violence histories were obtained at the baseline and 18-month and 36-month interviews. We coded IPV, based on the baseline interview, as a mutually exclusive categorical variable consisting of the following 3 groups: "none" (no violence reported); "minor violence" (at least 1 act of minor violence, but no acts of severe violence); or "severe violence" (at least 1 act of severe violence).^{18,19}

Health Care Use

Caregivers were asked at the 18-month and 36-month interviews the following questions to quantify children's ED use and hospitalizations: "Since the last interview, how many times has (child) gone to an ED or to urgent care for an illness or injury?" and "Since the last interview, how many times has (child) been admitted to a hospital or medical facility overnight for an illness or injury?" We assessed the impact of IPV on children's health care use over the 2 intervals assessed in the original survey: baseline to 18 months (interval 1) and 18 months to 36 months (interval 2).

Demographics

Caregivers provided information about sampled children's age and sex, as well as their own age, race/ethnicity, educational attainment, marital status, and income.

Substance Dependence and Depression

Caregiver substance dependence (alcohol and drug) and depression were assessed using the World Health Organization Composite International Diagnostic Interview Short-Form, which has been shown to have good reliability and validity.²⁰ Alcohol dependence and drug dependence were each coded as a dichotomous variable. Because of substantial missing data in the interview waves after baseline for the complete Composite International Diagnostic Interview Short-Form for depression, we classified women as being depressed based on their

response to the following question (answered by >85% of respondents): "During the past 12 months, was there a time when you felt sad, blue, or depressed for 2 weeks or more in a row?"

Child Abuse and Neglect

Type of child maltreatment was based on the initial CPS report. The presence of child maltreatment was dichotomized based on whether reported cases were substantiated.

STATISTICAL ANALYSES

All analyses were conducted in Stata 9.1 (StataCorp LP, College Station, Texas) using sampling weights to account for the unequal probability of selection and using variance estimates that accounted for the stratified and clustered survey design. The data initially were described using frequencies for categorical variables. Bivariable analyses determined the relationship between the outcomes (ED use and hospitalizations) and potential covariates, as well as IPV and potential covariates.

Following the bivariable analyses, we used weight-adjusted negative binomial multivariable regression (selected because of evidence of overdispersion in the outcome data) to estimate incidence rate ratios (IRRs) for the adjusted relationship between baseline IPV in female caregivers and children's ED use and hospitalizations. Emergency department use and hospitalizations were examined in separate models over the 2 intervals previously described (interval 1, baseline to 18 months; interval 2, 18-36 months). Model covariates included child age and sex; caregiver age, education, race, marital status, income, depression, drug dependence, and alcohol dependence; and substantiated child abuse. Choice of model covariates reflected either evidence of confounding in bivariable analyses or documented associations in prior studies.^{9,11,12,21-23}

After conducting the primary multivariable analysis described earlier, we conducted a sensitivity analysis, restricting the sample to those families who only had IPV at baseline (and at no other points) compared with those who had no IPV at any point. These restrictions contrast with our primary analysis, wherein women who were positive for IPV at baseline may have been positive at later points, such that concurrent (as opposed to prior) IPV may have accounted for potential associations. The sensitivity analysis, therefore, facilitated our ability to determine whether prior IPV exposure only (exposure known to occur prior to the outcome) affected children's subsequent health care use.

RESULTS

From the entire NSCAW cohort, we analyzed the data of 2689 children during the first interval and 2546 children during the second interval, with 90% (2197) of children represented at both periods. The characteristics of the caregivers and the children, stratified by both the severity of IPV and the interval, are provided in **Table 1**. The majority of female caregivers were the child's mother. Fewer women with severe IPV were married, and a higher percentage had incomes lower than \$15 000 a year. The frequency of depression was higher among those women disclosing minor or severe IPV, and they were more likely to have substantiated child abuse reports.

Mean number of ED visits and hospitalizations, categorized by IPV severity, is presented in **Table 2**. Children whose female caregivers disclosed severe IPV at baseline had an average of 1.4 ED visits in the first interval and 0.9 in the second. Children whose female care-

givers had either no or minor baseline IPV had fewer ED visits on average. In interval 2, the mean number of hospitalizations for children exposed to minor IPV was 0.07; children exposed to severe or no baseline IPV had a mean of 0.09 hospitalization.

We estimated, over the 2 intervals, the adjusted association between exposure to 3 levels of baseline IPV, graded as none, minor, and severe, and the rate of both ED use and hospitalizations (**Table 3**). A history of severe IPV exposure at baseline was significantly associated with an increase in the rate of ED visits at both interval 1 (IRR, 2.0; 95% confidence interval [CI], 1.3-2.9) and interval 2 (IRR, 1.9; 95% CI, 1.2-3.0). For interval 2, minor IPV was significantly associated with fewer hospitalizations (IRR, 0.2; 95% CI, 0.1-0.6).

The results from a sensitivity analysis, restricted to those with baseline IPV exposure only compared with those with no documented IPV exposure throughout the 36 months of follow-up, also are documented in Table 3. Similar to the primary analyses, severe baseline IPV was associated with increased ED visits during interval 1 (IRR, 1.9; 95% CI, 1.1-3.2). During interval 2, exposure at baseline to IPV that was either minor (IRR, 1.8; 95% CI, 0.9-3.2) or severe (IRR, 1.8; 95% CI, 0.9-3.3) tended to increase ED visits, but these findings were not statistically significant (*P* value = .06 for both associations). While severe IPV at baseline was not significantly associated with subsequent hospitalizations in either interval, minor IPV was associated with decreased hospitalizations in both intervals (interval 1, IRR, 0.2; 95% CI, 0.1-0.6; interval 2, IRR, 0.3; 95% CI, 0.1-1.0).

COMMENT

This study of a nationally representative group of children referred to CPS determined that children exposed to severe IPV were at significantly increased risk of subsequent ED use. In an analysis restricted to those subjects exposed only to baseline severe IPV compared with children not exposed to IPV at any time, rates of ED visits were significantly higher for 18 months after the IPV was last reported and tended (with an attenuated effect that approached, but did not reach, statistical significance) to be higher up to 36 months after reported cessation of the violence. Surprisingly, results from our primary multivariable analysis indicated that children whose female caregivers disclosed minor baseline IPV had significantly fewer hospitalizations 18 to 36 months after baseline; the restricted analyses revealed fewer hospitalizations throughout both periods for children exposed to minor violence at baseline.

Our findings raise a number of issues. To start, as previously documented by the cross-sectional study performed by Casanueva et al,⁹ we found that children in homes with severe violence, and not minor violence, were at significantly increased risk of ED use. While we are not aware of other literature examining IPV severity and children's physical health or health care use, recently published work using the same data set documented that children living in homes with severe, but not with minor, violence were at risk for internalizing and externalizing behavior problems

Table 1. Characteristics of Female Caregivers and Children in the Sample

	%					
	Severe IPV		Minor IPV		No IPV	
	Interval 1 ^a (n=490)	Interval 2 ^b (n=384)	Interval 1 ^a (n=368)	Interval 2 ^b (n=307)	Interval 1 ^a (n=1831)	Interval 2 ^b (n=1855)
Caregiver						
Relation to child						
Mother	98	99	96	98	95	94
Not mother	2	1	4	2	5	6
Age, y						
< 35	69	66	56	51	66	61
≥ 35	31	34	44	49	34	39
Race						
White	59	68	57	62	56	66
Black	25	27	20	22	27	27
Other ^c	16	5	23	16	17	7
Ethnicity						
Hispanic	11	12	19	19	18	18
Highest degree						
< High school	32	31	30	33	30	29
High school	46	39	46	40	47	46
> High school	22	30	24	27	23	25
Marital status						
Married	23	25	40	54	30	35
Never married	37	32	22	18	33	31
Other	40	43	38	28	37	34
Income, \$/y						
≤ 14 999	54	53	36	28	41	37
15 000-24 999	18	15	22	31	27	26
≥ 25 000	28	32	42	41	32	37
Depression	41	40	36	43	27	27
Alcohol dependence	2	5	1	2	1	< 1
Drug dependence	3	5	4	1	1	2
Substantiated child abuse	32	35	36	35	26	27
Type of alleged abuse						
Physical	43	45	42	38	50	47
Sexual	7	8	15	17	11	12
Neglect	25	25	26	26	30	30
Other ^d	25	22	17	19	9	11
Child						
Male sex	44	48	49	48	52	53
Age, y						
0-2	18	3	12	6	13	3
3-10	57	68	60	28	62	61
≥ 11	25	29	28	36	25	36

Abbreviation: IPV, intimate partner violence.

^aInterval 1 = baseline through 18 months.

^bInterval 2 = 18 months through 36 months.

^cReflects Asian and Native American/Alaskan individuals; "other" response available at baseline interview only.

^dIncludes abandonment, moral/legal maltreatment, educational maltreatment, exploitation, and "other" response.

Table 2. ED Visits and Hospitalizations by IPV Severity

	Mean (95% Confidence Interval)					
	Interval 1 ^a			Interval 2 ^b		
	Severe IPV	Minor IPV	No IPV	Severe IPV	Minor IPV	No IPV
ED visits	1.4 (0.9-1.8)	0.9 (0.6-1.1)	0.7 (0.6-0.8)	0.9 (0.4-1.5)	0.5 (0.2-0.8)	0.5 (0.4-0.6)
Hospitalizations	0.2 (0.1-0.3)	0.1 (0.03-0.2)	0.1 (0.07-0.1)	0.09 (<0.01-0.2)	0.07 (<0.01-0.1)	0.09 (0.06-0.1)

Abbreviations: ED, emergency department; IPV, intimate partner violence.

^aInterval 1 = baseline through 18 months.

^bInterval 2 = 18 months through 36 months.

Table 3. Adjusted Association of IPV and Children's Health Care Use: Primary Model and Sensitivity Analysis

	Adjusted Incidence Rate Ratio (95% Confidence Interval) ^a			
	Interval 1 ^b		Interval 2 ^c	
	Severe IPV	Minor IPV	Severe IPV	Minor IPV
ED visits				
Primary model ^d	2.0 (1.3-2.9) ^e	1.0 (0.7-1.4)	1.9 (1.2-3.0) ^e	1.2 (0.7-2.0)
Sensitivity analysis ^f	1.9 (1.1-3.2) ^e	0.9 (0.5-1.4)	1.8 (0.9-3.3) ^g	1.8 (0.9-3.2) ^g
Hospitalizations				
Primary model ^d	1.3 (0.7-2.6)	0.5 (0.2-1.6)	1.3 (0.5-3.5)	0.2 (0.1-0.6) ^e
Sensitivity analysis ^f	1.7 (0.8-3.7)	0.2 (0.1-0.6) ^e	1.3 (0.6-3.1)	0.3 (0.1-1.0) ^e

Abbreviations: See Table 3.

^aAdjusted for child age and sex and caregiver age, education, race, marital status, income, depression, drug dependence, alcohol dependence, and substantiated child abuse.

^bInterval 1 = baseline through 18 months.

^cInterval 2 = 18 months through 36 months.

^dPrimary model: health care use of children whose female caregivers disclosed baseline IPV as compared with those children whose female caregivers did not disclose baseline IPV.

^e $P < .05$.

^fSensitivity analysis: sample restricted to female caregivers with baseline IPV only as compared with those children whose caregivers had no IPV at any point (baseline, 18 months, or 36 months).

^g $P = .06$.

compared with children in nonviolent households.¹⁹ Similarly, in a sample of 83 abused women, Lemmey et al²⁴ found that increasing severity of IPV correlated with higher rates of internalizing behaviors in children. Severe IPV likely significantly impacts maternal emotional health and decreases the ability to parent and to cope. The stress and emotional impact of the severe IPV on the mother then potentially affects multiple facets of child health, including emotional and physical health, and health care use.

While our findings regarding the association between severe IPV and subsequent child ED use accord well with prior research, our finding that children exposed to minor IPV were less likely to be hospitalized emphasizes how much remains to be understood about the relationship between IPV exposure and children's health care use. Whether this association is due to subsequent differences in the receipt (and success) of social or medical services by families with minor IPV compared with those without IPV or by some different mechanism remains to be clarified.

Finally, our study suggests the potential importance of the lingering effect of IPV on children's health and health care use. In particular, in our restricted analysis with children only exposed to baseline IPV, the effects of the IPV on ED use were significant for 18 months, with attenuation of this effect from 18 to 36 months. This indicates that past IPV in women might have an ongoing impact in some areas of children's health care use. This finding concurs with a recent study that found that, even 5 years after IPV ended, health care use of abused women was 20% higher than that of women who had never been abused, suggesting that the impact of IPV lingers even after the abuse has stopped.²⁵ Similarly, in their Adverse Childhood Experiences Study, Dube and colleagues^{26,27} documented a relationship between the number of adverse childhood events (including exposure to an abused mother) and adult health; hence, the impact of negative childhood events may persist years after the direct exposure has ceased. Additional longitudinal studies with more complex statistical modeling are needed to better elucidate this relationship.

Our findings should be interpreted in light of a number of limitations. First, we selected the NSCAW cohort because of the comparatively high quality of the data. However, because this cohort was based on CPS referral, inferences from this sample cannot be applied to a community-based population. Likewise, because all members of this cohort were more likely (than a non-CPS-referred sample) to be exposed to poverty, chaotic home environments, and other factors that may influence health service use, the differences in health care use between the group of subjects with no exposure to IPV and the groups with mild or severe exposure to IPV may have been attenuated, biasing results toward the null. Findings from a community-based population, then, may be more pronounced than what we have described herein.

Second, the design effect of the NSCAW sample—namely, the loss of effectiveness resulting from the use of cluster sampling as opposed to a true random sample—had a dramatic impact on our ability to detect associations, increasing the measured variance substantially. For example, when looking at the relationship between severe IPV and ED visits during the second period, the NSCAW sampling structure decreased our effective sample size to one-sixth of the actual sample size, drastically increasing the risk of type II error (failing to discern differences that in truth exist.) Third, determination of ED visits and hospitalizations was based on caregiver report and was not verified with medical records, likely leading to recall bias. Caregivers have been shown to provide accurate medical histories for their children, particularly with regard to hospitalizations.^{28,29} The accuracy of such recall, however, decreases with time,³⁰ and in the current sample, caregivers were asked to report events occurring up to 18 months prior. Finally, we focused solely on the impact on children of physical aggression between caregivers. Prior work suggests that exposure to physical aggression may affect children's health above and beyond exposure to frequent interparental psychological aggression.³¹⁻³³ Further research, however, is needed to deter-

mine how psychological aggression “fits” within the definition of IPV and how caregiver psychological aggression and physical aggression interact to affect children’s health.

Overall, research increasingly indicates that IPV leads to poor child health and well-being.^{4,33,34} Our study adds to prior work, finding that severe IPV leads to higher rates of child ED use. Our findings of fewer hospitalizations of children exposed to minor IPV, however, stands in contrast; in this relatively new field of research, additional work is clearly needed before definitive conclusions are reached about the impact of IPV on child health care use. A better understanding of how, over what time course, and why IPV affects child health care use will identify sites within the health care system where effective interventions for children exposed to IPV, and their caregivers, might be located.

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