

Unintended Pregnancy Among Adult Women Exposed to Abuse or Household Dysfunction During Their Childhood

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IN 1994, 49% OF US PREGNANCIES were unintended (ie, unwanted or occurring before the woman had intended to become pregnant).¹ Approximately half of all unintended pregnancies result in abortion and those that result in live births are associated with more maternal complications and poorer infant outcomes than intended pregnancies.^{1,2} Several studies have identified exposure to sexual or physical abuse during childhood as a risk factor for teenage pregnancies, most of which are unintended.³⁻⁶ Adolescents who have been sexually abused are more likely to have a greater number of sexual partners and to not use contraception, behaviors that increase their risk of unintended pregnancy.^{3,4}

To our knowledge, the relationship between exposure to childhood abuse and household dysfunction and the risk of unintended pregnancy during the adult reproductive years has not been studied. Most unintended pregnancies, however, do occur in adult women. In 1994, women 20 years and older ac-

Context Studies have identified childhood sexual and physical abuse as a risk factor for adolescent pregnancy but the relationship between exposure to childhood abuse and unintended pregnancy in adulthood has, to our knowledge, not been studied.

Objective To assess whether unintended pregnancy during adulthood is associated with exposure to psychological, physical, or sexual abuse or household dysfunction during childhood.

Design and Setting Analysis of data from the Adverse Childhood Experiences Study, a survey mailed to members of a large health maintenance organization who visited a clinic in San Diego, Calif, between August and November 1995 and January and March 1996. The survey had a 63.4% response rate among the target population for this study.

Participants A total of 1193 women aged 20 to 50 years whose first pregnancy occurred at or after age 20 years.

Main Outcome Measure Risk of unintended first pregnancy by type of abuse (psychological, physical, or sexual abuse; peer sexual assault) and type of household dysfunction (physical abuse of mother by her partner, substance abuse by a household member, mental illness of a household member).

Results More than 45% of the women reported that their first pregnancy was unintended, and 65.8% reported exposure to 2 or more types of childhood abuse or household dysfunction. After adjustment for confounders (marital status at first pregnancy and age at first pregnancy), the strongest associations between childhood experiences and unintended first pregnancy included frequent psychological abuse (risk ratio [RR], 1.4; 95% confidence interval [CI], 1.2-1.6), frequent physical abuse of the mother by her partner (RR, 1.4; 95% CI, 1.1-1.7), and frequent physical abuse (RR, 1.5; 95% CI, 1.2-1.8). Women who experienced 4 or more types of abuse during their childhood were 1.5 times (95% CI, 1.2-1.8) more likely to have an unintended first pregnancy during adulthood than women who did not experience any abuse.

Conclusions This study indicates that there may be a dose-response association between exposure to childhood abuse or household dysfunction and unintended first pregnancy in adulthood. Additional research is needed to fully understand the causal pathway of this association.

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counted for 76% of all unintended pregnancies.¹ Our study explored whether a history of abuse or household dysfunction during childhood was associated with an unintended first pregnancy during the adult reproductive years.

METHODS

We analyzed data from the Adverse Childhood Experiences (ACEs) Study. A complete description of this study's method was published previously.⁷ Briefly, the ACEs study sample included San Diego, Calif, enrollees in the Kaiser Permanente Medical Care Program who were encouraged to receive a standardized medical examination. About 81% of enrollees 25 years and older received such an examination in the Health Appraisal Clinic between 1992 and 1995. Those who were evaluated between August and November of 1995 or January and March of 1996 were mailed the ACEs study questionnaire, which included questions about childhood psychological, physical, and sexual abuse, and exposure to household dysfunction.

The sample included female respondents to the questionnaire who were aged 20 to 50 years and who had had at least 1 pregnancy. Women whose reproductive years occurred before the contraceptive pill was widely available (women ≥ 51 years) were excluded because contraceptive use is associated with pregnancy planning. Women who had never been pregnant were also excluded because there was no information on whether these women were infertile or successfully avoiding unwanted pregnancies. After the questionnaire had been mailed a second time to nonrespondents, the response rate was 63.4%. Respondents and nonrespondents had answered questions about experiences of childhood sexual abuse and about current health and psychosocial problems during their medical examinations. There were no statistically significant differences between respondents and nonrespondents in psychosocial or medical problems and respondents were no

more likely than nonrespondents to attribute their health and psychosocial problems to sexual abuse (V. J. Edwards, PhD, R.F.A., D.F.N., et al, unpublished data, 1998).

There were 1321 female respondents aged 20 to 50 years who had their first pregnancy at or after age 20 years. We excluded 128 women (9.7%) because of missing data for the pregnancy intendedness question; thus, 1193 women made up the sample. There were no differences between women with missing data and women with data for pregnancy intendedness, race/ethnicity, educational attainment, age at first sexual intercourse, age at first pregnancy, age at interview, and all of the childhood abuse or household dysfunction variables. Women with missing data for pregnancy intendedness were more likely to have unknown marital status at first pregnancy.

Women were coded as having had an unintended pregnancy if they answered no to the question, "When your first pregnancy began, did you intend to get pregnant at that time in your life?" Women were coded as having had an intended pregnancy if they answered yes.

Respondents were considered to have been exposed to abuse or household dysfunction if they responded positively to any of the questions included in the definitions (TABLE 1). We assessed 4 types of childhood abuse: psychological abuse (3 questions), physical abuse (2 questions), sexual abuse (4 questions), and peer sexual assault (1 question). We also assessed 3 types of household dysfunction: physical abuse of the mother by her partner (4 questions), substance abuse by a household member (2 questions), and mental illness of a household member (2 questions). Questions from the conflict tactics scale⁸ were used to define psychological abuse, physical abuse, and physical abuse of the mother by her partner. Sexual abuse questions were based on questions developed by Wyatt.⁹ Questions on a household member's abuse of alcohol or drugs were adapted from the 1988 National Health Interview Survey.¹⁰

To assess a dose-response relationship between exposure to childhood abuse or household dysfunction and an unintended first pregnancy during adulthood, we examined separately the frequency of exposure to abuse and the additive effect of experiencing more than 1 type of abuse or household dysfunction. Frequency of the exposure was available for psychological abuse, physical abuse, and physical abuse of the mother by her partner. We defined infrequent exposure as events that occurred once, twice, or sometimes and frequent exposure as events that occurred often or very often. To assess the effect of being exposed to more than 1 type of abuse or household dysfunction, we also added the number of types of exposure each woman reported. For this summary measure, we included any psychological abuse (infrequent or frequent), physical abuse (infrequent or frequent), physical abuse of the mother by her partner (infrequent or frequent), sexual abuse, peer sexual assault, and household substance abuse or mental illness.

Based on previous studies,^{1,11} we assessed 6 potential confounders: race/ethnicity, educational attainment, marital status at first pregnancy, age at first sexual intercourse, age at first pregnancy, and age at the time of the interview (20-39 and 40-50 years). Women were considered to have been married during their first pregnancy if the year of their first marriage was before or the same as the year in which the pregnancy ended. Women with missing dates were coded as unknown marital status. Age at interview was assessed as a potential confounder because of the possibility of differences in the 2 age groups (20-39 and 40-50 years).

Missing observations were excluded from specific analyses as follows: 4 (0.3%) for race/ethnicity, 77 (6.5%) for age at first sexual intercourse experience, 65 (5.4%) for age at first pregnancy, 20 (1.7%) for psychological abuse, 20 (1.7%) for physical abuse, 87 (7.3%) for sexual abuse, 8 (<1.0%) for peer sexual assault, 23 (1.9%) for physical abuse of the mother by her partner, 1

(<1.0%) for substance abuse by a household member, and 10 (<1.0%) for household member with a mental illness. Women with any missing observations were statistically similar to women without any missing observations for all types of childhood abuse or household dysfunction and for pregnancy intendedness. Women with missing observations were more likely to have unknown marital status at first pregnancy, to be less educated, younger, and of other race.

Separate logistic regression models assessed the association between unintended pregnancy and each type of exposure to childhood abuse or household dysfunction after adjustment of confounding variables. We used the change-in-estimate strategy to evaluate whether a given potential risk factor was a confounder.¹² The likelihood ratio test was used to assess first-order interactions with educational attainment, marital status at first pregnancy, age at first sexual intercourse, and age at first pregnancy for each type of exposure to childhood abuse or household dysfunction. Because of multiple tests for interactions, statistical significance was set at $P = .01$.

Since an adjusted odds ratio would have overestimated the risk ratio, we computed an estimated adjusted risk ratio from logistic regression coefficients by using the method described by Zhang and Yu.¹³ We calculated the attributable fraction, an estimate of the percentage of unintended first pregnancies associated with experiencing 2 or more types of abuse or household dysfunction during childhood.¹⁴

RESULTS

Almost 66% of women reported exposure to at least 2 types of abuse or household dysfunction (Table 1). The number of different types of abuse or household dysfunction ranged from 0 to 7; the mean number of types of exposure was 2.5. Psychological and physical abuse were the most common. Almost 30% of the respondents reported a history of sexual abuse and 28.5% had mothers who had been physically abused by their partners.

Table 1. Percentage of Women Exposed to Childhood Abuse or Household Dysfunction

Type of Childhood Exposure*	% of Women Responding Positively			
	Overall (N = 1193)†	Infrequent‡	Frequent§	Other
Psychological abuse	64.4	44.5	19.9	
A parent or other adult in the household Swore at, insulted, or put me down		38.4	17.4	
Acted in a way that made me afraid that I would be physically hurt		24.6	8.3	
Threatened to hit or throw something at me but didn't		33.0	8.7	
Physical abuse	51.6	43.1	8.5	
A parent or other adult in the household Pushed, grabbed, shoved, or slapped me		41.0	7.7	
Hit me so hard that I had marks or was injured		21.9	3.6	
Sexual abuse	29.2			
An adult or person at least 5 years older Touched or fondled me in a sexual way				27.0
Had me touch his/her body in a sexual way				11.3
Attempted oral, anal, or vaginal intercourse with me				11.6
Had oral, anal, or vaginal intercourse with me				8.4
Peer sexual assault	14.3			
A boy or group of boys my age physically forced me or overpowered me to have sexual contact				
Physical abuse of mother by her partner	28.5	21.2	7.3	
My father or stepfather or my mom's boyfriend did these things to my mother or stepmother Pushed, grabbed, slapped, or threw something at her		20.0	6.9	
Kicked, bit, hit her with a fist or with something hard		9.4	3.9	
Repeatedly hit her over at least a few minutes		7.0	2.4	
Threatened or hurt her with a knife or gun		4.3	0.6	
Substance abuse	36.2			
Lived with anyone who was a problem drinker or alcoholic				32.5
Lived with anyone who used street drugs				9.9
Mental illness	26.4			
Lived with a household member who was depressed or mentally ill				24.4
Lived with a household member who attempted suicide				7.1
Exposed to various forms of abuse¶				
0				18.3
1				15.9
2				19.0
3				18.4
≥4				28.4

*Childhood was defined as the first 18 years of life.
 †Percentages do not equal the sum of all positive responses because some women experienced more than 1 of the specific abuses.
 ‡Indicates abuse occurred once, twice, or sometimes.
 §Indicates abuse occurred often or very often.
 ||Abuse was not defined as infrequent or frequent.
 ¶Includes psychological, physical, and sexual abuse; peer sexual assault; physical abuse of mother by her partner; substance abuse; and mental illness.

Most respondents were white, had some college education or were college graduates, and were married at the time of their first pregnancy (TABLE 2). About 70% of the women were 18 years or older when they first had sexual intercourse. Most respondents had their first pregnancy when they were aged 20 to 24 years and were between 40 and 50 years of age at the interview.

More than 45% of the women reported that their first pregnancy was unintended (Table 2). Percentages of unintended first pregnancy were higher for women who reported frequent abuse or household dysfunction during childhood than for women who reported infrequent abuse or household dysfunction during childhood (TABLE 3). In addition, as the number of types of exposure to abuse or household dysfunction during childhood increased, the percentage of women with an unintended first pregnancy increased from 31.9% among women with no ex-

posures to 63.7% among women with 4 or more types of exposure.

Using the change-in-estimate strategy to assess for confounding, 2 variables were identified as confounders: marital status and age at first pregnancy. Most associations between unintended pregnancy and childhood abuse and household dysfunction were statistically significant except for infrequent psychological abuse, substance abuse by a household member, and mental illness of a household member (Table 3). The strongest associations with an unintended first pregnancy included frequent psychological abuse (adjusted relative risk [RR], 1.4; 95% confidence interval [CI], 1.2-1.6), frequent physical abuse of the mother by her partner (adjusted RR, 1.4; 95% CI, 1.1-1.7), and frequent physical abuse (adjusted RR, 1.5; 95% CI, 1.2-1.8). The RRs for unintended first pregnancy were higher for women who reported fre-

quent abuse or household dysfunction during childhood than for women who reported infrequent abuse or household dysfunction during childhood. For example, the adjusted RR was 1.2 (95% CI, 1.0-1.4) among women who reported infrequent physical abuse and 1.5 (95% CI, 1.2-1.8) among women who reported frequent physical abuse. Women who experienced 4 or more types of abuse during childhood were 1.5 times (95% CI, 1.2-1.8) more likely to have an unintended first pregnancy during adulthood than women who did not experience any abuse. The goodness-of-fit test indicated that each of the 7 logistic models adequately explained the variability in the data, suggesting that important variables were not omitted from the models. No significant interactions were found with educational attainment, marital status, age at first sexual intercourse, and age at first pregnancy.

The attributable fraction for having an unintended first pregnancy due to experiencing 2 or more types of abuse or household dysfunction during childhood was 20%. Therefore, 1 in 5 unintended first pregnancies was associated with the woman's history of abuse and household dysfunction during childhood.

COMMENT

This study documented a dose-response association between exposure to childhood abuse or household dysfunction and unintended first pregnancy during adulthood. When adjusting for confounders, women who experienced frequent physical abuse or were exposed to 4 or more types of abuse were 1.5 times as likely to have an unintended first pregnancy as women who did not experience abuse. Although the RRs were relatively modest, given the common occurrence of the outcome (>45%), we found that 1 in 5 of the unintended pregnancies was associated with childhood exposure to abuse. Our findings are consistent with those of other studies in which associations between physical or sexual abuse and risky sexual behaviors dur-

Table 2. Selected Characteristics of Respondents (N = 1193)

Characteristic	Total No. (%)	No. (%) of First Pregnancies	
		Unintended	Intended
Race/ethnicity			
White	736 (61.0)	323 (44.5)	403 (55.5)
Black	71 (6.0)	43 (60.6)	28 (39.4)
Other	174 (14.6)	74 (42.5)	100 (57.5)
Hispanic	218 (18.3)	100 (45.9)	118 (54.1)
Missing	4		
Educational attainment			
No high school diploma	49 (4.1)	25 (51.0)	24 (49.0)
High school graduate	183 (15.3)	79 (43.2)	104 (56.8)
Some college	416 (34.9)	206 (49.5)	210 (50.5)
College graduate	545 (45.7)	233 (42.7)	312 (57.3)
Marital status at first pregnancy			
Married	868 (72.8)	273 (31.4)	595 (68.6)*
Unmarried	175 (14.7)	155 (88.6)	20 (11.4)
Unknown	150 (12.6)	115 (76.7)	35 (23.3)
Age at first sexual intercourse, y			
≤14	92 (8.2)	61 (66.3)	31 (33.7)*
15-17	247 (22.1)	124 (50.2)	123 (49.8)
≥18	777 (69.6)	327 (42.1)	450 (57.9)
Missing	77		
Age at first pregnancy, y			
20-24	648 (57.4)	366 (56.5)	282 (43.5)*
25-50	480 (42.6)	129 (26.9)	351 (73.1)
Missing	65		
Age at interview, y			
20-39	439 (36.4)	226 (51.5)	213 (48.5)*
40-50	754 (63.6)	317 (42.0)	437 (58.0)

*P<.05.

ing adolescence were reported.³⁻⁶ Our study suggests that the effects of childhood abuse continue past adolescence into adulthood. Although other studies found associations between physical or sexual abuse and unintended pregnancy, our study provides new evidence for an association between unintended first pregnancy and other types of adverse childhood experiences, including psychological abuse, peer sexual assault, and physical abuse of the mother by her partner.

Additional research is needed to understand the casual pathway. The abuse or household dysfunction may influ-

ence a woman's feelings of control or power in sexual relationships and may lead to difficulty in negotiating contraceptive use with a partner. A recent national study found that adult women who did not use contraception but who did not want to become pregnant were more likely to have had more than 1 partner over the course of a year; additionally, those who were ineffective users of contraception were more likely to be in unstable relationships or to have experienced sexual pressure or coercion.¹⁵ Because we did not have information on each woman's relationship including current abuse at the time of the

first pregnancy, number of sexual partners, or contraceptive use at the time of the unintended pregnancy, we were unable to explore these intermediary variables. However, the ACE Study found that 2 related lifetime variables—ever having had a sexually transmitted disease and having had 50 or more sexual partners—were associated with abuse and household dysfunction during childhood among both men and women.⁷ The strength of the association between unintended first pregnancy and childhood abuse or household dysfunction diminished somewhat after adjustment for age and marital status at first

Table 3. Separate Associations Between a History of Child Abuse and Household Dysfunction and Unintended First Pregnancies Among Adult Women*

Type of Childhood Exposure	No. (%) of First Pregnancies		Relative Risk (95% Confidence Interval)	
	Unintended	Intended	Unadjusted	Adjusted†
Psychological abuse				
No	156 (37.3)	262 (62.7)‡§	Referent	Referent
Infrequent	242 (46.4)	280 (53.6)	1.2 (1.1-1.4)	1.1 (0.9-1.3)
Frequent	138 (59.2)	95 (40.8)	1.6 (1.4-1.8)	1.4 (1.2-1.6)
Physical abuse				
No	220 (38.7)	348 (61.3)‡§	Referent	Referent
Infrequent	247 (48.9)	258 (51.1)	1.3 (1.1-1.4)	1.2 (1.0-1.4)
Frequent	67 (67.0)	33 (33.0)	1.7 (1.5-2.0)	1.5 (1.2-1.8)
Sexual abuse				
No	320 (40.9)	463 (59.1)‡	Referent	Referent
Yes	186 (57.6)	137 (42.4)	1.4 (1.2-1.6)	1.2 (1.1-1.4)
Peer sexual assault				
No	435 (42.9)	580 (57.1)‡	Referent	Referent
Yes	104 (61.2)	66 (38.8)	1.4 (1.2-1.6)	1.2 (1.0-1.5)
Household dysfunction (physical abuse of the mother by her partner)				
No	345 (41.6)	485 (58.4)‡§	Referent	Referent
Infrequent	129 (52.4)	117 (47.6)	1.3 (1.1-1.4)	1.2 (1.0-1.4)
Frequent	54 (63.5)	31 (36.5)	1.5 (1.3-1.8)	1.4 (1.1-1.7)
Substance abuse				
No	318 (41.8)	442 (58.2)‡	Referent	Referent
Yes	208 (48.2)	224 (51.8)	1.2 (1.1-1.4)	1.1 (0.9-1.3)
Mental illness				
No	373 (42.8)	498 (57.2)‡	Referent	Referent
Yes	166 (53.2)	146 (46.8)	1.2 (1.1-1.4)	1.1 (0.9-1.3)
Exposed to various forms of abuse				
0	69 (31.9)	147 (68.1)‡§	Referent	Referent
1	70 (37.2)	118 (62.8)	1.1 (0.8-1.4)	1.1 (0.8-1.4)
2	96 (42.9)	128 (57.1)	1.4 (1.1-1.7)	1.3 (1.0-1.6)
3	115 (53.0)	102 (47.0)	1.7 (1.3-2.0)	1.4 (1.1-1.8)
≥4	121 (63.7)	69 (36.3)	1.8 (1.5-2.0)	1.5 (1.2-1.8)

*Separate models were run for each type of abuse or household dysfunction exposure with unintended first pregnancy as the outcome. In addition, a separate model was run that included the summary of the total number of types of exposure. Childhood was defined as the first 18 years of life.

†Adjusted for age and marital status at first pregnancy.

‡P<.05.

§P<.05 for trend.

||Includes psychological, physical, and sexual abuse; peer sexual assault; physical abuse of mother by her partner; substance abuse; and mental illness.

pregnancy. While we treated these variables as confounders to present a conservative measure of association, these variables may be in the casual pathway between abuse during childhood and subsequent unintended pregnancy during adulthood.

To our knowledge, this is the first study to explore the association in adult women between a history of child abuse and household dysfunction and an unintended first pregnancy. A limitation of this study is that the validity and reliability of our measures of abuse, household dysfunction, and pregnancy intendedness are unknown. However, a strength is that our data are consistent with data from other studies. For example, the prevalence of childhood sexual abuse in our study (30%) is similar to that reported in a national survey (27%).¹⁶ Also similar to findings of a national survey, percentages of unintended pregnancy were higher for black women, unmarried women, and younger women than for their counterparts.^{1,11} Another strength of this study is the wide range of types of childhood abuse and household dysfunction explored. Given the social stigma of abuse and the possible repression of memories, percentages of abuse and household dysfunction

may have been underreported. Unintended pregnancies ending in abortion also are likely to have been underreported.¹⁷ In addition, the percentage of women with histories of physical and sexual abuse is high among those attending abortion clinics.^{18,19} In a retrospective study such as ours, there is always a possibility of recall bias. However, we have no information as to whether women who have been abused are more or less likely to report an unintended pregnancy. In the absence of a recall bias, the underreporting of abuse and unintended pregnancy would underestimate the strength of the relation between the childhood exposures and unintended pregnancy during adulthood.

The generalizability of our findings to other populations can be assessed only if our findings are replicated in independent samples of women. We limited our study sample to women for whom the contraceptive pill was generally available during their reproductive years (women 50 years and younger at the time of the study). We did analyze the data from women 51 years and older at the time of the study and found similar results (data not shown). Given the strong association between contraceptive use and pregnancy planning,

however, our findings may be most generalizable to cohorts of women aged 20 to 50 years who had their first pregnancy during adulthood.

This study documented an association between exposure to abuse and household dysfunction during childhood and a subsequent unintended first pregnancy during adulthood. The vast majority of women in this study had experienced some type of abuse or household dysfunction during their childhoods, and almost 1 in 5 unintended pregnancies was associated with those negative experiences. The pathways through which childhood abuse and household dysfunction affect sexual behavior in adulthood are complex and not fully understood. Nonetheless, our findings suggest that medical providers need to be aware that a history of abuse or household dysfunction is common among adult women and may be affecting their patients' ability or motivation to prevent an unintended first pregnancy.

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