

Exposure to Violence and Associated Health-Risk Behaviors Among Adolescent Girls

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Objective: To examine the relationship between exposure to violence and health-risk behaviors.

Design: Cross-sectional survey.

Setting: University-based outpatient family planning clinic.

Patients: Sexually active adolescent girls younger than 18 years (N=517) who presented for contraceptive care.

Main Outcome Measures: Prevalence of witnessing or experiencing violence and the associations with health-risk behaviors, including high-risk sexual behaviors, substance use, and self-injury.

Results: Compared with adolescents who had not been exposed to violence, those who had only witnessed violence were 2 to 3 times more likely to report using tobacco and marijuana, drinking alcohol or using drugs before sex, and having intercourse with a partner who had multiple partners. Those who had experienced, but not wit-

nessed violence were at increased risk of these same behaviors and were 2 to 4 times more likely than those who had neither witnessed nor experienced violence to report early initiation of intercourse, intercourse with strangers, multiple partners, or partners with multiple partners, tobacco, alcohol and drug use, or to have positive test results for a sexually transmitted disease. Individuals who had both witnessed and experienced violence demonstrated the greatest risk of adverse health behaviors. These adolescents demonstrated 3 to 6 times greater risk of suicidal ideation (odds ratio [OR], 3.1; 95% confidence interval [CI], 2.2-4.0) or suicide attempts (OR, 4.5; 95% CI, 2.2-9.4), self-injury (OR, 5.8; 95% CI, 2.6-12.9), and use of drugs before intercourse (OR, 6.2; 95% CI, 3.0-12.9) than those who had neither witnessed nor experienced violence.

Conclusions: Adolescents exposed to violence are at increased risk of multiple adverse health behaviors. Programs designed to improve health outcomes should target this high-risk group.

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PRIOR STUDIES have demonstrated that exposure to violence at a young age may lead to physical as well as psychological problems, such as depression, low self-esteem, posttraumatic stress disorder, and a fatalistic view of the future.¹⁻⁶ Furthermore, witnessing and experiencing violence during the childhood or adolescent years has been shown to be a strong predictor of adverse health behaviors such as substance abuse,⁷⁻⁹ an increased number of sexual partners,¹⁰ and violent behavior.^{11,12} However, prior studies have not determined if witnessing violence is associated with the same consequences as experiencing violence because most studies have merged those who witnessed and experienced violence into a single group or focused only on those who experienced violence.^{8,10,13,14} In addition, prior studies have not determined whether

the strength of the association between violence and adverse health behaviors varies according to whether the adolescent witnessed or experienced violence.

To address this gap in the literature, we conducted a study to evaluate the relationship between health-risk behaviors and exposure to violence among a sample of sexually active adolescent girls. We hypothesized that adolescents who had experienced violence would report a greater number of adverse health behaviors than adolescents who had only witnessed violence or who had neither witnessed nor experienced violence. Furthermore, we expected that the risk of engaging in adverse health behaviors would be stronger among those experiencing violence or both witnessing and experiencing violence than among those who had only been a witness or those who reported neither experiencing nor witnessing violence.

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SUBJECTS AND METHODS

The study population consisted of adolescents younger than 18 years who initiated care at The University of Texas Family Planning Clinic in Galveston between June 28, 1992, and April 28, 1994. This facility serves an indigent population of whom more than 80% earn a gross monthly income of less than 133% of the poverty level. As part of standard care, a structured interview was conducted with each adolescent at her first visit to this facility to collect information on demographic characteristics, exposure to violence, and sexual and health-risk behaviors. Adolescents were interviewed consecutively by trained clinic personnel. Although no patient who received care during this time refused to be assessed, clinic traffic patterns prevented approximately 5% of patients from being interviewed. Fifty-three (9%) additional subjects were excluded because we could not accurately assign them to 1 of the violence groups because of missing data. Complete data were available for 517 adolescents. There were no significant differences between those who were included and those who were not with regard to race/ethnicity, school enrollment, or repetition of more than 1 grade in school. Those who were excluded were approximately 6 months younger, on average, than the sample examined (15.1 vs 15.6 years old; $P = .006$).

The structured questionnaire elicited information on demographic characteristics (age, race/ethnicity, school enrollment, and repetition of ≥ 1 grades in school) and recent use of tobacco, alcohol, and marijuana. Exposure to violence was assessed with an 11-item questionnaire developed by Gladstein et al,¹⁵ using the witness and victim (experienced violence) subscales. Adolescents were asked if they had seen or experienced any of the following violent acts in their lifetime: robbery, physical attack, threatened or completed rape, or threats against their life. In addition, they were asked if they had witnessed a murder. Information obtained on health-risk behaviors included suicidal ideation or suicide attempts and high-risk sexual behaviors engaged in during their lifetime (number of pregnancies, age at first intercourse, lifetime number of sexual partners, consistency of birth control and condom use, use of alcohol or other drugs before sex, having a partner who had multiple partners, or having sex with individuals they did not know well [hereafter referred to as sex with strangers]). With institutional review board approval, trained research assistants reviewed the medical records to extract patient responses to interviews as well as the number

of sexually transmitted diseases (STDs) detected at that visit. All data were entered into a computerized database. To ensure accuracy, a second trained assistant verified a random 10% of data entries. Agreement of 99% or greater was observed across all data entries.

VARIABLE IDENTIFICATION

Age at first intercourse was dichotomized as younger than 13 years or 13 years or older, and number of lifetime partners was coded as 1 or 2 or more. Inconsistent use of birth control was coded as yes if the adolescent stated that she did not use some type of birth control every time she had intercourse. Similarly, inconsistent use of condoms was coded as yes if the adolescent stated that she did not use a condom every time she had intercourse. Other high-risk sexual behaviors (having a partner with multiple partners, sex with strangers, use of alcohol or drugs before sex) were each coded as yes if the patient reported this behavior in the last year. Sexually transmitted disease was coded as yes if the adolescent had a probe or positive culture result for gonorrhea, chlamydia, or genital herpes; a positive blood test result for syphilis; or visual evidence of condyloma acuminata at that clinic visit.

STATISTICAL ANALYSES

Demographic characteristics, sexual behavior, substance use, and reports of self-injury were compared among adolescents who reported neither witnessing nor experiencing violence with (1) those who witnessed, but never experienced violence; (2) those who experienced, but never witnessed violence; and (3) those who reported both witnessing and experiencing violence. All 4 groups were mutually exclusive. Data were analyzed using χ^2 analyses and logistic regression models where appropriate. Crude and adjusted odds ratios (adjusted for race/ethnicity, age, school enrollment, and having repeated a grade) and 95% confidence intervals are reported for (1) sexual behaviors (number of pregnancies, multiple partners, sexual debut, birth control use, partner with multiple partners, sex with strangers, alcohol use before sex, drug use before sex, frequency of condom use, and presence of an STD); (2) substance use in the last 12 months; and (3) risk of self-injury. Adjusted odds ratios from the logistic regression models that were overestimated owing to a more than 10% incidence rate among those who neither witnessed nor experienced violence were corrected using the formula suggested by Zhang and Yu.¹⁶ Significance was defined as $P < .05$.

RESULTS

Of 517 girls, 248 (48%) of the sample reported that they had witnessed, experienced, or both witnessed and experienced a robbery, physical attack, rape, threat against a life, or murder during their lifetime. From the sample, 108 (21%) girls stated that they had witnessed but not personally experienced any of these acts, while 72 (14%) stated that they had personally been the target of a violent act (experienced), but had not witnessed a violent act inflicted on someone else. Sixty-eight (13%) reported both witnessing and experiencing violence. The remaining 269 adolescents did not report witnessing or experiencing any of these violent acts. Comparison of demographic characteristics

demonstrated no significant differences between those who had neither witnessed nor experienced violence and those who had witnessed, experienced, or both witnessed and experienced violence (**Table 1**).

Adolescents who reported witnessing but not experiencing violence exhibited 5 types of health-risk behaviors significantly more often than those who had never witnessed or experienced violence; they were approximately twice as likely to report alcohol or drug use before sex and almost 3 times more likely to report sex with a partner who had multiple partners (**Table 2**). Moreover, they reported tobacco and marijuana use in the last 12 months more often than those who had neither witnessed nor experienced violence (**Table 3**). Other high-

Table 1. Demographic Characteristics of the Sample by Violence History*

	Neither Witnessed nor Experienced (n = 269)	Witnessed Only† (n = 108)	Experienced Only† (n = 72)	Witnessed and Experienced (n = 68)
Mean age, y	15.6	15.7	15.6	15.7
Race/ethnicity				
Black	50	54	51	45
Hispanic	25	30	26	22
White	24	13	21	31
Other	2	4	1	2
Enrolled in school	81	83	75	75
Repeated ≥1 grade	37	41	43	34

*Denominators vary because of missing data for some variables. All values are percentages unless indicated otherwise.

†P values were assessed by comparison with the "neither witnessed nor experienced" violence group using the *t* test (mean age) or χ^2 analyses. All comparisons had a *P* value >.05.

Table 2. High-Risk Sexual Behavior Reported by Violence History*

Behavior	Neither Witnessed nor Experienced, % (n = 269)	Witnessed Only (n = 108)		Experienced Only (n = 72)		Witnessed and Experienced (n = 68)	
		%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)
≥1 Pregnancy	50	48	0.9 (0.5-1.4)	51	1.0 (0.5-1.7)	32	0.6 (0.3-0.8)
≥2 Sexual partners	58	64	1.5 (0.9-2.4)	74	2.1 (1.2-3.9)	80	1.4 (1.2-1.5)
First intercourse at <13 years old	9	9	1.2 (0.5-2.6)	26	3.9 (1.9-8.0)	21	3.0 (1.4-6.5)
Inconsistent birth control use	68	71	1.2 (0.7-1.9)	69	1.0 (0.6-1.8)	66	1.0 (0.5-1.8)
Partner with multiple sexual partners	13	33	2.8 (1.9-3.9)	23	2.2 (1.1-4.3)	41	3.3 (2.2-4.5)
Sex with strangers	11	14	1.3 (0.7-2.7)	24	2.2 (1.3-3.6)	25	2.4 (1.3-3.8)
Drank alcohol before sex	22	33	2.3 (1.3-4.0)	30	1.9 (1.0-3.5)	46	2.3 (1.6-3.0)
Used illicit drugs before sex	9	14	2.2 (1.0-4.5)	19	2.7 (1.3-5.9)	32	6.2 (3.0-12.9)
Inconsistent condom use	71	66	0.8 (0.5-1.3)	66	0.8 (0.4-1.4)	67	0.7 (0.4-1.4)
Sexually transmitted disease at visit	14	17	1.5 (0.8-2.8)	26	2.2 (1.3-3.2)	22	1.8 (0.9-3.6)

*Denominators vary because of missing data for some variables. AOR indicates adjusted odds ratio; CI, confidence interval. Adjusted ORs and *P* values were assessed by comparison with those who neither witnessed nor experienced violence.

Table 3. Substances Used in the Last 12 Months by Violence History*

Substance Used	Neither Witnessed nor Experienced, % (n = 269)	Witnessed Only (n = 108)		Experienced Only (n = 72)		Witnessed and Experienced (n = 68)	
		%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)
Tobacco	12	18	2.2 (1.4-3.4)	26	3.0 (1.8-4.4)	32	2.7 (1.6-4.1)
Alcohol	20	30	1.5 (0.9-2.4)	33	2.0 (1.3-2.7)	48	2.4 (1.6-3.2)
Marijuana	6	14	2.5 (1.3-4.6)	13	3.0 (1.5-6.1)	22	6.7 (3.4-13.1)

*Denominators vary because of missing data for some variables. AOR indicates adjusted odds ratio; CI, confidence interval. AORs and *P* values were assessed by comparison with those who neither witnessed nor experienced violence.

risk sexual behaviors, alcohol use in the last 12 months, and risk of self-injury were not significantly more likely in the witnessed-only group compared with those who had neither witnessed nor experienced violence (Tables 2 and 3 and **Table 4**).

Adolescents who had personally experienced but not witnessed violence exhibited a number of health-risk behaviors significantly more often than did those who had neither witnessed nor experienced violence. These adolescents were more than twice as likely to have had 2 or more sexual partners, had sex with someone who had multiple partners, had sex with strangers, used drugs before sex, and had positive test results for an STD at the clinic visit. In addition, they were almost 4 times more likely to have had sexual intercourse for the first time prior to age 13 years (Table 2). Furthermore, adolescents who had only experienced violence were 2 to 3 times as likely as those who had neither

witnessed nor experienced violence to report tobacco, alcohol, and substance use in the past 12 months and to have considered or attempted suicide (Tables 3 and 4).

Associations between health-risk behaviors and violence were strongest among those who reported both witnessing and experiencing violence. These adolescents reported tobacco and alcohol use in the last 12 months, having had sex for the first time prior to age 13 years, having sex with strangers, having a partner with multiple partners, and using alcohol before sex 2 to 3 times as often as those not exposed to violence (Tables 2 and 3). Having considered suicide was reported 3 times more frequently and having attempted suicide was reported 4.5 times more frequently than in adolescent girls who had neither witnessed nor experienced violence (Table 4). Marijuana use in the last 12 months, using drugs before sex, and self-inflicted injury were reported approximately 6 times more often by this

Table 4. Risk of Self-injury by Violence History*

Behavior	Neither Witnessed nor Experienced, % (n = 269)	Witnessed Only (n = 108)		Experienced Only (n = 72)		Witnessed and Experienced (n = 68)	
		%	AOR (95% CI)	%	AOR (95% CI)	%	AOR (95% CI)
Self-inflicted injury	5	9	1.8 (0.7-4.5)	9	1.7 (0.6-4.8)	25	5.8 (2.6-12.9)
Considered suicide	16	19	1.3 (0.7-2.4)	39	2.6 (1.7-3.5)	49	3.1 (2.2-4.0)
Attempted suicide	7	7	1.1 (0.4-2.6)	14	2.1 (0.9-4.9)	27	4.5 (2.2-9.4)

*Denominators vary because of missing data for some variables. AOR indicates adjusted odds ratio; CI, confidence interval. AORs and P values were assessed by comparison with those who neither witnessed nor experienced violence.

group than those who had neither witnessed nor experienced violence (Tables 2-4).

COMMENT

Most of the prior studies on violence exposure and risky behavior have not differentiated between those who witnessed and those who experienced violence. In this study, we separated those who had only witnessed violence from those who had experienced violence to examine the independent relationship of each to health-risk behaviors. Adolescents who reported only witnessing violence exhibited 5 types of health-risk behaviors significantly more often than those who had neither witnessed nor experienced violence, whereas those who had only experienced violence were at increased risk for most of the adverse health behaviors we examined. Adolescents who both witnessed and experienced violence had the highest risk. Thus, witnessing violence, although damaging, does not appear to be as damaging as actually being a target of violence.

These findings are in agreement with those reported by Hughes¹⁷ in her study of children aged 3 to 12 years who witnessed vs those who witnessed and experienced violence in their home. In Hughes' study, a linear trend was observed for both behavioral problems and anxiety levels, with children who both witnessed and experienced violence showing the most distress, followed by those who had only witnessed violence and then by those who had neither witnessed nor experienced violence. Similar to our study, this study suggests that it is essential to differentiate witnesses from those who have both witnessed and experienced violence when examining related behavior.

Mazza and Reynolds¹⁸ have postulated that the relationship between violence and poor mental health may be mediated by posttraumatic stress disorder. This theory is supported by several studies that have demonstrated that exposure to domestic or community violence frequently leads to posttraumatic stress disorder. For example, Horowitz et al³ found that 67 of 79 young urban women who had experienced between 8 to 55 different types of violent events met *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition* criteria for posttraumatic stress disorder. Singer et al³ found exposure to violence to be a salient factor in predicting trauma symptoms in high school students, with scores for total trauma symptoms directly related to the amount of exposure to violence. Similarly, we noted that those who had experienced or witnessed and experienced violence were more likely to report previously considering suicide. Our finding that those who had

only witnessed violence were not significantly more likely than those who had neither witnessed nor experienced violence to report self-injury is in line with the findings of Horowitz et al,³ who found that witnessing but not experiencing violent events did not significantly correlate with posttraumatic stress disorder.

Witnesses of violence were at increased risk, however, of tobacco and marijuana use. These findings are similar to those noted in a previous study on pregnant adolescents at our institution¹⁹ as well as the findings of others.^{9,10,13,20} In a recent study of more than 4000 adolescents, Kilpatrick and associates⁹ noted that those who had witnessed violence, as well as those who had experienced physical or sexual assault, were more likely to meet *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* criteria for substance abuse or dependence. Furthermore, drug users who had experienced violence reported using a given substance for the first time at an earlier age than those who had not experienced violence. The authors speculated that exposure to violence may lead to maladaptive coping responses and thus substance use may be an attempt to self-medicate. Alternatively, however, the coexistence of violence and substance use may emerge from unconventionality in the adolescent's personality, environment, and behavioral experiences.²¹ Experiencing or witnessing violence may expose the adolescent to an unconventional situation and alter his or her personality (via self-esteem mechanisms, depressive symptomatology), environment (introducing fear, feelings of learned helplessness), and behaviors (unwanted initiation of adult behaviors). According to the theory, problem experiences and behaviors cluster together, leading the adolescent to engage in risky behaviors, such as experimentation with drugs or reckless driving.²²

Experiencing violence was noted to increase significantly the likelihood of an adolescent engaging in multiple high-risk sexual behaviors. Those who reported experiencing violence or both witnessing and experiencing violence exhibited 6 high-risk sexual behaviors significantly more often than those who had neither witnessed nor experienced violence. Some of this effect may be related, at least in part, to the high incidence of early initiation of sexual intercourse among those who had experienced violence. In this study, both those who had experienced and those who had witnessed and experienced violence were significantly more likely than those who had neither witnessed nor experienced violence to have had their first sexual encounter before the age of 13 years. It is highly likely that, in many cases, this first act of sexual intercourse was involuntary. Whether voluntary or invol-

What This Study Adds

Witnessing and experiencing violence during the childhood or adolescent years have been shown to be strong predictors of adverse health behaviors. However, prior studies have not determined if witnessing violence is associated with the same consequences as experiencing violence because most studies have merged those who witnessed and experienced violence into a single group or focused only on those who experienced violence. To address this gap in the literature, we conducted a study to evaluate the relationship between health-risk behavior and witnessing or experiencing violence among a sample of sexually active adolescent girls.

Adolescents who reported witnessing but not experiencing violence exhibited an increased risk of 5 types of adverse health behaviors more often than those who had never witnessed or experienced violence. Those who had experienced but not witnessed violence were at increased risk of 11 different adverse behaviors, whereas those individuals who had both witnessed and experienced violence demonstrated an increased risk for 12 adverse health behaviors. Programs designed to improve health outcomes should differentiate between adolescents who only witness and those who directly experience violence to target those at greatest risk.

untary, early onset of sexual activity is known to lead to an increased risk of multiple partners and decreased discrimination of partner selection,²³ both of which place the adolescent at risk of STDs and pregnancy. Gender-specific approaches to understanding risk behavior would suggest that the proposed association between exposure to violence and the performance of risk behaviors may be particularly strong among adolescent girls by virtue of their unequal social status and vulnerability, particularly with regard to sexual behaviors.²⁴

Our study has several limitations. First, we could not determine causality because we used a cross-sectional study design. Second, we conducted this survey among adolescents motivated to seek family planning services. Thus, our results may not be applicable to the general population. Third, we used an instrument to assess exposure to violence that was not standardized because we were unable to locate a standardized instrument in the literature. However, the percentage of adolescent girls in our sample who experienced each of the violent acts was noted to be similar to that observed by Gladstein et al¹⁵ in their female subjects. Finally, we relied on self-report of violence and risk behaviors that may have led to recall bias. Prior studies, however, have demonstrated that self-report of sensitive behavior by adolescents is reliable and valid.^{25,26}

In summary, exposure to violence is clearly associated with an increased likelihood of engaging in multiple health-risk behaviors, with adolescent girls who both experience and witness violence at greatest risk. Additional research is needed to determine the temporal sequence of this association as well as to determine the effect of potentially confounding variables. If it is confirmed that experiencing violence leads to high-risk behaviors during adolescence, then clinicians should consider screening adolescent girls under their care for prior exposure to vio-

lence. Those who screen positive should be examined more closely for risk-taking behaviors, such as substance use. In addition, these adolescent girls need careful screening for mental health disorders, as well as STDs, and referral to a mental health professional when appropriate.

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