

Dating Violence, Sexual Assault, and Suicide Attempts Among Urban Teenagers

Elyse Olshen, MD, MPH; Katharine H. McVeigh, PhD, MPH; Robin A. Wunsch-Hitzig, PhD; Vaughn I. Rickert, PsyD

Objective: To evaluate the relationship between dating violence, sexual assault, and suicide attempts among urban adolescents.

Design: Secondary analysis of the 2005 New York City Youth Risk Behavior Survey.

Setting: Eighty-seven New York City public high schools.

Participants: Representative population-based sample of 8080 students, 14 years and older.

Main Exposures: Dating violence in the past year and lifetime history of sexual assault.

Outcome Measure: One or more suicide attempts in the past year.

Results: Respondents were 50.0% female and primarily black (36.0%) or Hispanic (40.1%). In the past year, 11.7% of females and 7.2% of males reported 1 or more

suicide attempts. Lifetime history of sexual assault was reported by 9.6% of females and 5.4% of males. Dating violence in the past year was reported by 10.6% of females and 9.5% of males. In multivariate models, controlling for persistent sadness, sexual orientation, and significant risk behaviors, recent dating violence (odds ratio, 1.61; 95% confidence interval, 1.05-2.47) was associated with suicide attempts in adolescent girls, while lifetime history of sexual assault (odds ratio, 3.86; 95% confidence interval, 2.11-7.06) was associated with suicide attempts in adolescent boys.

Conclusions: In this population of urban youth, recent dating violence among females and lifetime history of sexual assault among males were significantly associated with suicide attempts. Clinicians and educators should be trained to routinely screen adolescents for violence victimization and should have a low threshold for referring these at-risk teenagers for mental health services.

Arch Pediatr Adolesc Med. 2007;161:539-545

SUICIDE IS THE THIRD LEADING cause of death in adolescents.¹ Although rates of adolescent suicide declined from 1991 to 2002,² they remain unacceptably high. In 2003, 6.5 per 100 000 US teenagers aged 14 to 19 years committed suicide. Completion rates in this age group varied significantly by sex and race.³ Risk factors for adolescent suicide include prior suicide attempts, depression, and substance abuse.⁴ Research to identify adolescents at risk for suicide attempts has been specified, by the Institute of Medicine,⁵ as a priority for preventing adolescent suicide.

*For editorial comment
see page 609*

Data from the 2005 National Youth Risk Behavior Survey (YRBS) suggest that suicide attempts are quite common among teenagers, with 8.4% of high school stu-

dents reporting 1 or more attempts in the previous year.⁶ Using the 1993 Massachusetts YRBS, Woods et al⁷ demonstrated that adolescents who attempt suicide participate in other risky behaviors, including physical fights, gun carrying, and cigarette and other substance use. In addition, adolescent suicide attempts have been linked to alcohol and other substance abuse, violence perpetration, disordered eating, and nonheterosexual identification.⁸⁻¹³ Finally, recent data¹⁴ suggest that adolescents who attempt suicide have increased rates of depression and conduct disorder, which may predispose these youth to engage in health-compromising behaviors.

Prior studies¹⁵⁻¹⁹ have demonstrated that a history of childhood or adolescent sexual assault can predispose adolescents to future sexual assault and dating violence victimization. Childhood sexual assault has been clearly linked to adolescent depression, alcohol use, and violence perpetration.²⁰ Furthermore, as many as one third

Author Affiliations: Division of General Pediatrics, Department of Pediatrics, Columbia University Medical Center (Dr Olshen), Heilbrunn Department of Population and Family Health, Mailman School of Public Health, Columbia University (Drs Olshen and Rickert), and New York City Department of Health and Mental Hygiene (Drs McVeigh and Wunsch-Hitzig), New York, NY.

of female sexual assault survivors are known to develop post-traumatic stress disorder.²¹ Therefore, sexual assault would seem to be a likely risk factor for a suicide attempt. However, findings from prior research^{4,22-24} on whether sexual assault is an independent risk for future suicidal behavior have been mixed. Understanding the relationship between sexual assault and suicidal behavior is important because data from the 2005 National YRBS found 10.8% of adolescent girls and 7.5% of adolescent boys report a lifetime history of forced sexual activity.⁶

Rates of adolescent dating violence vary widely, from 9% to 43%,^{6,9,16,25} based on definitions used and populations surveyed. In the 2005 National YRBS, 9.3% of adolescent girls and 9.0% of adolescent boys reported being hit, slapped, or hurt on purpose by a boyfriend or girlfriend in the past year.⁶ Recent reports²⁵⁻³⁰ indicate there may be an independent association between dating violence and suicidal thoughts and behaviors. However, dating violence has also been shown to be associated with depressive symptoms and multiple health-compromising behaviors.^{25,28-30} Furthermore, rates of dating violence vary by sex and race/ethnicity.^{6,15,16} Thus, it is possible that the demonstrated association between dating violence and suicide attempts is confounded by demographic characteristics, coexisting depression, and other adolescent risk behaviors. Most research²⁵⁻³⁰ on dating violence and suicidality in adolescents has been conducted in nationally representative or largely white populations. Although black and Hispanic adolescents report higher rates of dating violence than their white peers,^{6,15,16} to our knowledge, no study has evaluated the association between dating violence victimization and suicide specific to minority teenagers.

The purpose of the present study was to address gaps in the literature by examining the independent relationships between dating violence, sexual assault, and suicide attempts among urban adolescents. We hypothesized that, after controlling for factors identified in previous research^{4,7-13} to be associated with suicide attempts, dating violence and sexual assault would each be significantly associated with adolescent suicide attempts in a population of predominantly black and Hispanic urban teenagers.

METHODS

The YRBS is a biennial survey of public high school students designed and supported by the Centers for Disease Control and Prevention (CDC), conducted in states and localities throughout the United States since 1991. The New York City (NYC) YRBS was first conducted in 1993; by 1997, response rates were high enough (>60%) to produce usable data. In 2005, the NYC YRBS was jointly administered by the NYC Department of Health and Mental Hygiene and Department of Education. The YRBS monitors priority health risk behaviors that contribute to the leading causes of mortality, morbidity, and social problems among youth. A complete description of the YRBS survey methodology is available.³¹

SAMPLE

The 2005 NYC YRBS used a stratified, 2-stage, cluster sample design to produce a representative sample of students. The

sample was stratified by borough, with oversampling in 3 particularly poor neighborhoods in which NYC Department of Health and Mental Hygiene maintains District Public Health Offices, to permit estimation of prevalence at the city, borough, and District Public Health Office levels.

The first-stage sampling frame contained a specified number of primary sampling units, consisting of schools, selected with probability proportional to the school enrollment size. The second sampling stage consisted of randomly selected classes designated by period of the day (eg, second period) from grades 9 to 12 at each chosen school. All students in the selected classes were eligible to participate in the survey. English as a second language and special education classrooms were excluded.

The survey was conducted in the classroom and was self-administered, with a data collector present. Survey procedures were designed to protect the privacy of students by allowing for anonymous and voluntary participation. Parents were informed of the survey prior to data collection and could elect that their child not participate. Study methods were approved by Department of Health and Mental Hygiene and Department of Education institutional review boards.

The 2005 YRBS initial sample included 91 schools; 2 were ineligible, and 2 refused to participate. The final sample of 87 schools resulted in a school response rate of 97.8% (of the 89 schools eligible). Return visits were made to 50 schools to ensure an adequate response rate. Of 11 710 eligible students, 8140 completed the questionnaire, for a student response rate of 69.5%. The overall response rate was 68.0%.

MEASURES

In 2005, the NYC YRBS questionnaire consisted of 99 items, the maximum number allowed by the CDC YRBS protocol. Of these items, 86 were CDC core questions and 13 were chosen largely from the CDC archive of optional YRBS questions. The self-administered anonymous questionnaire measured different risk behaviors, including tobacco, alcohol, and other drug use; unintentional injury and violence; sexual behaviors; dietary behaviors; and physical activity.

Primary Dependent Variable

The primary dependent variable, suicide attempt, was a dichotomous variable derived from the question, "During the past 12 months, how many times did you actually attempt suicide?" Respondents who indicated 0 times were coded as no, and respondents who answered 1, 2 or 3, 4 or 5, or 6 or more times were coded as yes. This question has been used in the YRBS since 1991. A study of test-retest reliability³² in 1999 showed the item to have substantial reliability ($\kappa = 72.7\%$). This reliability estimate is believed to be conservative because the correspondence between time 1 and time 2 estimates may be confounded by true changes in prevalence.³²

Independent Variables

Key independent variables included the following: (1) dating violence ("During the past 12 months did your boyfriend or girlfriend ever hit, slap, or physically hurt you on purpose?") ($\kappa = 53.6\%$ ³²) and (2) sexual assault ("Have you ever been physically forced to have sexual intercourse when you did not want to?") ($\kappa = 65.8\%$ ³³). These reliability estimates may also be conservative.³²

Other variables of interest, based on prior studies^{4,7-13} showing an association with suicidal behavior, included items related to alcohol (ever drink alcohol, first alcohol use before the age of 13 years, alcohol use in the past 30 days, binge drinking

Table 1. Prevalence of Persistent Sadness, Suicidal Behavior, and Violence Victimization in NYC Public High School Students, 2005

Variable	Female Adolescents (n = 4118)		Male Adolescents (n = 3962)	
	No. of Respondents*	% (95% Confidence Interval)†	No. of Respondents*	% (95% Confidence Interval)†
Persistent sadness‡	1581	40.2 (36.4-44.1)	926	24.2 (22.0-26.5)
Suicidal ideation	757	19.9 (17.4-22.7)	369	10.3 (9.2-11.5)
Suicide attempt	400	11.7 (10.1-13.4)	215	7.2 (5.5-9.4)
Injured in attempt	81	2.0 (1.3-3.0)	78	3.2 (2.3-4.4)
Violence victimization				
Sexual assault§	358	9.6 (7.0-12.9)	218	5.4 (4.3-6.8)
Dating violence	437	10.6 (8.7-13.0)	376	9.5 (7.9-11.3)

Abbreviation: NYC, New York City.

*Unweighted data.

†Weighted data (prevalence).

‡Sad or hopeless 2 or more weeks in a row during the past 12 months.

§Ever physically forced to have sexual intercourse.

||Ever hit, slapped, or physically hurt on purpose by a boyfriend or girlfriend in the past 12 months.

or ≥ 5 drinks in a row in the past 30 days, and alcohol use at school), tobacco use (ever smoked a cigarette, first cigarette smoked before the age of 13 years, and smoked cigarettes daily for the past 30 days), safety (in the past 30 days, have you . . . rode in a car with a driver who had been drinking alcohol, drove a car after drinking alcohol, carried a weapon, carried a gun, or felt unsafe at school), violence (in the past 12 months have you been . . . threatened at school, involved in a physical fight, or injured in a physical fight), and persistent sadness (feeling sad or hopeless for ≥ 2 weeks in a row during the past 12 months). Respondents were recoded as having disordered eating if they reported fasting for 24 hours; using diet pills, powders, or liquids; vomiting; or using laxatives in the past 30 days. Respondents were recoded as using "hard drugs" if they reported any lifetime use of cocaine, heroin, methamphetamines, ecstasy (3,4-methylenedioxymethamphetamine), or inhalants. Respondents were recoded as using "any drugs" if they reported lifetime use of hard drugs or marijuana. Sexual orientation was also evaluated as an independent predictor for suicide attempts. Respondents were recoded into 2 groups ("heterosexual [straight]" and a combined category of "gay or lesbian," "bisexual," and "not sure"). These groupings were consistent with prior research on sexual orientation and suicide, using the Massachusetts YRBS.¹¹

Self-reported race/ethnicity was recoded into 4 categories: white, black, Hispanic, and Asian/other. Age was coded as 14, 15, 16, 17, and 18 years or older, and grade as 9th, 10th, 11th, and 12th grade.

STATISTICAL ANALYSIS

Data were weighted to adjust for nonresponse and for varying probabilities of selection. Weights were scaled so that (1) the sum of the weights was equal to the total sample size and (2) the weighted distribution of students matched the age, race, sex, and geographic distribution of NYC public high school students. Analyses were limited to respondents 14 years and older.

All prevalence, bivariate, and multivariate analyses were stratified by sex. First, we examined the univariate prevalence of suicide attempts, dating violence, sexual assault, sexual orientation, demographic variables, and risk behaviors. Then, we conducted bivariate analyses to examine the associations between hypothesized independent predictors and suicide attempts, using χ^2 testing. Finally, multivariate analyses were conducted using logistic regression. The original models included

main effects for all variables significant ($P < .05$) on χ^2 testing. The models were run iteratively with the least significant variable removed at each step until only significant correlates remained. Two potential confounders, age and race, that dropped out during the modeling process were then reintroduced. These variables were not significant and did not significantly affect other variables and, thus, were not retained. In the female model, lifetime history of sexual assault dropped out early in the modeling process and was reintroduced. When added to the multivariate model, the sexual assault variable was not significant and did not change other predictors, so it was not retained in the final female model. Similarly, dating violence dropped out early from the male model and was then reintroduced. When added to the multivariate model, the dating violence variable was not significant and did not change other predictors, so it was not retained in the final model. Interactions were tested for significant independent predictors, including dating violence, sexual assault, and sexual orientation. However, the sample size was too small for reliable estimates to be calculated. Thus, interaction terms were not included in the final models. All analyses were conducted using SAS statistical software (SAS-Callable SUDAAN; SAS Institute Inc, Cary, NC) to account for the complex survey design.

RESULTS

Of the original 8140 students surveyed, 60 were younger than 14 years and were excluded from this study. Responses from 8080 adolescents 14 years and older, who attended NYC public high schools, were included in the analyses. The sample, which was weighted to be representative of the total NYC public high school population, was 51.0% female and primarily nonwhite (40.1% Hispanic, 36.0% black, 16.0% Asian/other, and 7.9% white).

Table 1 presents the prevalence of persistent sadness, suicidal behavior, and violence victimization among public high school students in this major city. Persistent sadness (feeling sad or hopeless daily for 2 weeks in a row during the past year) occurred in 40.2% of female students and 24.2% of male students; also, 19.9% of females and 10.3% of males reported suicidal ideation or

Table 2. Unadjusted Odds Ratios for 1 or More Suicide Attempts Among Adolescent Males and Females by Significant Risk Behaviors*

Risk Behavior	Female Adolescents	Male Adolescents
Main predictors		
Dating violence	3.5 (2.2-5.8)	4.1 (2.5-6.8)
Sexual assault	2.2 (1.4-3.4)	9.1 (5.0-16.5)
Sexual orientation†		
Gay	0.9 (0.3-2.6)	6.2 (1.7-22.7)
Bisexual	5.3 (2.9-9.8)	12.8 (6.5-25.3)
Unsure	2.4 (1.1-5.4)	6.8 (3.3-13.9)
Combined group of gay, bisexual, or unsure orientation	3.7 (2.4-5.9)	9.0 (5.3-15.3)
Alcohol-related behaviors		
Ever drink alcohol	3.1 (1.9-5.1)	1.7 (1.0-2.8)
First alcohol use before the age of 13 y	2.0 (1.3-2.9)	2.0 (1.4-3.0)
Alcohol use in the past 30 d	2.3 (1.7-3.3)	1.8 (1.0-3.1)
Binge drinking	3.2 (2.0-5.1)	3.8 (1.9-7.7)
Alcohol use at school	2.6 (1.3-5.0)	5.0 (3.0-8.4)
Smoking and other drug use		
Cigarette use before the age of 13 y	2.6 (1.7-4.1)	4.8 (3.1-7.5)
Daily cigarette use	3.4 (2.0-5.8)	6.2 (3.8-9.9)
Use of hard drugs‡	3.1 (1.8-5.1)	7.1 (3.6-14.0)
Use of any drugs§	1.9 (1.3-2.9)	3.3 (1.8-6.0)
Eating behaviors: disordered eating	3.8 (2.5-5.7)	5.2 (3.2-8.4)
Violence and safety		
Unsafe at school	3.5 (1.8-7.1)	4.7 (2.3-9.6)
Physical fight	2.5 (1.8-3.7)	2.4 (1.4-4.1)
Never or rarely using a seatbelt	1.2 (0.8-1.8)	2.4 (1.6-3.6)
Rode with drinking driver	1.6 (0.9-2.7)	2.6 (1.7-4.1)
Drove when drinking	2.2 (0.8-6.0)	9.6 (5.0-18.5)
Carried a weapon	3.0 (1.9-5.0)	3.9 (2.2-7.0)
Carried a gun	4.3 (1.0-17.6)	8.0 (3.6-17.7)
Threatened at school	2.2 (1.3-3.9)	4.4 (2.8-6.8)
Injured in a fight	4.6 (2.7-8.0)	5.6 (2.3-13.9)
Emotional distress: feeling sad or hopeless	4.5 (3.0-6.8)	5.3 (3.4-8.2)

*Data are given as odds ratio (95% confidence interval).

†The reference group was heterosexuals.

‡Includes any lifetime use of cocaine, heroin, methamphetamines, ecstasy (3,4-methylenedioxymethamphetamine), or inhalants.

§Includes any lifetime use of hard drugs or marijuana.

||Includes fasting for 24 hours; using diet pills, powders, or liquids; vomiting; or using laxatives in the past 30 days.

seriously considering attempting suicide in the past year. Finally, 11.7% of adolescent girls and 7.2% of adolescent boys attempted suicide 1 or more times in the past year. A much smaller proportion of adolescent girls and boys were injured or sought medical attention following a suicide attempt. Lifetime history of sexual assault was experienced by 9.6% of adolescent girls and 5.4% of adolescent boys. The prevalence of dating violence in the past year was 10.6% among adolescent girls and 9.5% among adolescent boys.

Bivariate analyses, stratified by sex, identified significant associations ($P < .05$) between suicide attempts and each of the following variables or domains: dating violence in the past 12 months; lifetime history of sexual assault; persistent sadness; homosexual, bisexual, or unsure sexual orientation; and risky behaviors related to alcohol, tobacco, other drugs, disordered eating, violence, and safety. Unadjusted odds ratios for these variables are shown in **Table 2**. We did not detect associations between suicide attempts and age, grade, or race/ethnicity.

Variables associated with suicide attempts were then entered into multivariate models. For adolescent girls, dating violence in the past 12 months was indepen-

dently associated with suicide attempts. Lifetime history of sexual assault was not associated with 1 or more suicide attempts. Other significant correlates of suicide attempts in adolescent girls included in the final model were sexual orientation, persistent sadness, disordered eating, feeling unsafe at school, engaging in a physical fight, and binge drinking (**Table 3**).

Among male high school students, in multivariate analyses, lifetime history of sexual assault was independently associated with suicide attempts, but dating violence in the past 12 months was not. Other correlates of suicide attempts among adolescent boys included in the final model were sexual orientation, persistent sadness, disordered eating, drug use, and gun possession (Table 3).

COMMENT

In this representative citywide survey of 8080 public high school students, 11.7% of adolescent girls and 7.2% of adolescent boys reported at least 1 suicide attempt in the prior year. In multivariate models, controlling for persistent sadness, sexual orientation, and multiple poten-

tially confounding risk behaviors, dating violence was associated with suicide attempts in adolescent girls, while history of sexual assault was associated with suicide attempts in adolescent boys.

We found that adolescent girls reporting recent dating violence were 60% more likely to report 1 or more suicide attempts in the past year. This association is similar in magnitude to that reported among predominantly white adolescent girls from Massachusetts²⁵ and Vermont.²⁷ Our findings differ from those of Borowsky et al.⁹ who found, in a national sample of teenagers, much stronger associations between baseline violence victimization and suicide attempts during a 1-year follow-up (odds ratio, 8.9 for black girls, 7.7 for white girls, and 2.7 for Hispanic girls). However, the increased odds ratios in their study may have been observed because the authors did not distinguish between dating violence and other types of violence reported by teenagers.

Unfortunately, our study was not designed to assess why dating violence is associated with suicide attempts. Prior research³⁰ suggests that teenagers who are depressed at baseline are more likely to enter into violent relationships. Further studies have found that teenagers who are victimized by dating partners are more likely to develop posttraumatic stress disorder and other mental health disorders.³³ The co-occurrence of posttraumatic stress disorder and depression is a strong risk for suicidal behaviors, including attempted suicide.³⁴ Thus, our findings are consistent with existing models of violence victimization and mental health disorders.

Because other studies¹⁶⁻¹⁹ have identified history of sexual assault to be associated with future victimization, we were interested in evaluating the role of recent dating violence and lifetime history of sexual assault in a single model of adolescent suicide attempts. One prior study²⁸ found that 50% of teenagers reporting dating violence and date rape also reported a suicide attempt. Other studies among adult women²³ and adolescent girls²⁴ have also reported an association between sexual assault and suicide attempts. These studies were conducted in largely white or adult female cohorts. Among urban adolescent girls, we found that lifetime history of sexual assault was not independently associated with suicide attempts. Our findings may have differed from those of other researchers because our model of risks for female suicide attempts controlled for persistent sadness, sexual orientation, and other potentially confounding risk behaviors. While our results should be interpreted with caution, they may represent true null findings regarding the association between sexual assault and suicide attempts in this population.

For adolescent boys, we found that history of sexual assault was associated with suicide attempts, whereas dating violence was not; adding dating violence to the final model did not impact the relationship between sexual assault and suicide attempts. These marked differences between adolescent boys and girls are striking and bear further investigation. Our measure of lifetime history of sexual assault did not distinguish between childhood sexual abuse and teenage sexual assault, 2 distinct entities. Therefore, it is not clear whether the association between lifetime sexual assault and suicide attempts we iden-

Table 3. Final Multiple Logistic Regression Models: Outcome Is 1 or More Suicide Attempts in the Past 12 Months

Variable	Adjusted Odds Ratio (95% Confidence Interval)*
Female Adolescents	
Dating violence	1.61 (1.05-2.47)
Sexual orientation	2.45 (1.31-4.56)
Feeling sad or hopeless	3.60 (2.21-5.87)
Disordered eating	1.82 (1.16-2.87)
Unsafe at school	1.94 (1.19-3.16)
Physical fighting	1.61 (1.13-2.28)
Binge drinking	1.82 (1.23-2.72)
Male Adolescents	
Sexual assault	3.86 (2.11-7.06)
Sexual orientation	3.44 (1.88-6.32)
Feeling sad or hopeless	4.31 (2.24-8.30)
Disordered eating	2.57 (1.07-6.15)
Drug use	2.26 (1.06-4.83)
Carried a gun	4.27 (1.66-11.00)

*Adjusted for the specific variables included for each sex in the table. Bold type indicates these were the main predictors or variables of interest; all other variables are "control variables."

tified in adolescent boys reflects trauma from a recent assault or trauma from childhood sexual abuse. While many prior studies^{4,19,35-37} have demonstrated a relationship between childhood sexual abuse and suicide, reports^{4,22-24} on the association between adolescent sexual assault and suicide have been mixed. Our findings may be consistent with 2 reports^{38,39} that indicate, compared with adolescent girls, adolescent boys exhibit increased suicidal behaviors in the months following a sexual assault. Furthermore, our findings are consistent with a recent study using the 2001 National YRBS, which found lifetime history of sexual assault to be associated with suicide attempts among males, but not among females.⁴⁰

Our study was unique in controlling for sexual orientation when evaluating violence victimization and suicide attempts among urban teenagers. Similar to prior studies,¹⁰⁻¹³ we found that adolescent boys and girls who identified as gay, lesbian, bisexual, or unsure vs those who identified as heterosexual were 3.4 and 2.5 times, respectively, as likely to report at least 1 suicide attempt in the past year. Unfortunately, we were unable to conduct subgroup analyses because of the small number of teenagers identifying as gay, bisexual, lesbian, or unsure. However, the strength of the association that we detected suggests that sexual orientation should be included as a covariate in future evaluations of risks for adolescent suicide attempts. Future research is needed to better evaluate subgroups and to determine whether there is an interaction between violence victimization and sexual orientation.

One strength of this study was that we were able to examine the relationship between violence victimization in a population at high risk. Black and Hispanic teenagers are known to experience increased rates of dating violence,^{6,15,16} and Hispanic teenagers report higher rates of suicide attempts compared with their white peers.⁶

However, our study, similar to at least 1 prior study,⁴⁰ suggests there are no racial/ethnic differences in the associations between dating violence, sexual assault, and suicide attempts.

Limitations of this research should be noted. First, as a cross-sectional study, we were not able to assess the temporal relationships between dating violence, sexual assault, and suicide attempts. While our measures of suicide attempts and dating violence were restricted to the prior 12 months, it is possible that some or all of the suicide attempts reported preceded the episodes of dating violence or sexual assault. Second, our analyses of dating violence, sexual assault, and suicide attempts were all based on single-item responses. While these variables have been shown to have high test-retest reliability,³² teenagers may have had varying interpretations of the questions on dating violence, sexual assault, and suicide attempts. In particular, the association found between sexual assault and suicide attempts in adolescent boys, but not in adolescent girls, may have resulted from differences in how adolescent boys and girls define sexual assault. Our accuracy would have been improved with explicit definitions or multiple questions assessing each of the key variables. A final limitation of this study was that we were not able to assess the seriousness or lethality of the reported suicide attempt. While the YRBS does evaluate whether students were injured from a suicide attempt in the past year, rates were too low (2.0% for females and 3.2% for males) to permit logistic regression modeling for this outcome.

Our research provides further evidence of the association between dating violence and suicide attempts among adolescent girls and of the association between sexual assault and suicide attempts among adolescent boys. Our study is unique in evaluating these relationships in a population of predominantly minority urban youth and in evaluating violence victimization, while controlling for multiple potential confounding factors, in a single model. While our study focused on public high school students in a single urban area, our results are likely generalizable to urban youth across the United States. Our findings are of concern because dating violence and sexual assault are highly prevalent among urban youth. Teenagers reporting violence victimization are at increased risk for suicide attempts. Questions about violence, depression, anxiety, substance abuse, and suicidality are all extremely important and should be included as part of a comprehensive health assessment of adolescents. Furthermore, clinicians, educators, and other professionals working with youth should be trained to routinely screen for violence victimization and should have a low threshold for referring these at-risk teenagers for mental health services.

Accepted for Publication: November 14, 2006.

Correspondence: Elyse Olshen, MD, MPH, 622 W 168th St, Room VC-402, New York, NY 10032 (eo85@columbia.edu).

Author Contributions: *Study concept and design:* Olshen, McVeigh, Wunsch-Hitzig, and Rickert. *Analysis and interpretation of data:* Olshen, McVeigh, and Rickert. *Drafting of the manuscript:* Olshen and McVeigh. *Critical re-*

vision of the manuscript for important intellectual content: Olshen, McVeigh, Wunsch-Hitzig, and Rickert. *Statistical analysis:* Olshen, McVeigh, and Rickert. *Study supervision:* McVeigh, Wunsch-Hitzig, and Rickert.

Financial Disclosure: None reported.

Acknowledgment: We thank Bonnie Kerker, PhD, MPH, and Lorna Thorpe, PhD, for their thoughtful and thorough review of the manuscript.

REFERENCES

1. Anderson RN, Smith BL. Deaths: leading causes for 2001. *Natl Vital Stat Rep.* 2003;52:1-85.
2. Centers for Disease Control and Prevention (CDC). Methods of suicide among persons aged 10-19 years: United States, 1992-2001. *MMWR Morb Mortal Wkly Rep.* 2004;53:471-474.
3. National Center for Injury Prevention and Control. WISQARS: Web-based Injury Statistics Query and Reporting System. <http://www.cdc.gov/ncipc/wisqars/>. Accessed May 16, 2006.
4. Zimetkin AJ, Alter MR, Yemini T. Suicide in teenagers. *JAMA.* 2001;286:3120-3125.
5. Board on Neuroscience and Behavioral Health, Institute of Medicine. *Risk Factors for Suicide: Summary of a Workshop.* Washington, DC: National Academy Press; 2001.
6. Eaton DK, Kann L, Kinchen S, et al. Youth risk behavior surveillance: United States, 2005. *MMWR Surveill Summ.* 2006;55:1-108.
7. Woods ER, Lin YG, Middleman A, Beckford P, Chase L, DuRant RH. The associations of suicide attempts in adolescents. *Pediatrics.* 1997;99:791-796.
8. Rosenberg HJ, Jankowski MK, Sengupta A, Wolfe RS, Wolford GL, Rosenberg SD. Single and multiple suicide attempts and associated health risk factors in New Hampshire adolescents. *Suicide Life Threat Behav.* 2005;35:547-557.
9. Borowsky IW, Ireland M, Resnick MD. Adolescent suicide attempts: risks and protectors. *Pediatrics.* 2001;107:485-493.
10. Russell ST, Joyner K. Adolescent sexual orientation and suicide risk: evidence from a national study. *Am J Public Health.* 2001;91:1276-1281.
11. Garofalo R, Wolf RC, Wissow LS, Woods ER, Goodman E. Sexual orientation and risk of suicide attempts among a representative sample of youth. *Arch Pediatr Adolesc Med.* 1999;153:487-493.
12. Remafedi G, French S, Story M, Resnick MD, Blum R. The relationship between suicide risk and sexual orientation: results of a population-based study. *Am J Public Health.* 1998;88:57-60.
13. Faulkner AH, Cranston K. Correlates of same-sex sexual behavior in a random sample of Massachusetts high school students. *Am J Public Health.* 1998;88:262-266.
14. Foley DL, Goldston DB, Costello EJ, Angold A. Proximal psychiatric risk factors for suicidality in youth: the Great Smoky Mountains Study. *Arch Gen Psychiatry.* 2006;63:1017-1024.
15. Rickert VI, Wiemann CM, Harrykissoon SD, Berenson AB, Kolb E. The relationship among demographics, reproductive characteristics, and intimate partner violence. *Am J Obstet Gynecol.* 2002;187:1002-1007.
16. Rickert VI, Wiemann CM, Vaughn R, White JW. Rates and risk factors for sexual violence among an ethnically diverse sample of adolescents. *Arch Pediatr Adolesc Med.* 2004;158:1132-1139.
17. Humphrey JA, White JW. Women's vulnerability to sexual assault from adolescent to young adulthood. *J Adolesc Health.* 2000;27:419-424.
18. Lodico MA, Gruber E, DiClemente RJ. Childhood sexual abuse and coercive sex among school-based adolescents in a midwestern state. *J Adolesc Health.* 1996;18:211-217.
19. Seedat S, Stein MB, Forde DR. Association between physical partner violence, posttraumatic stress, childhood trauma, and suicide attempts in a community sample of women. *Violence Vict.* 2005;20:87-98.
20. Hussey JM, Chang JJ, Kotch JB. Child maltreatment in the United States: prevalence, risk factors, and adolescent health consequences. *Pediatrics.* 2006;118:933-942.
21. Tjaden P, Thoennes N. *Full Report of the Prevalence, Incidence and Consequences of Violence Against Women: Findings From the National Violence Against Women Survey.* Washington, DC: National Institute of Justice, Office of Justice Program, US Dept of Justice, and Centers for Disease Control and Prevention; 2000. Publication NCCJ183781.
22. Nilsen W, Conner KR. The association between suicidal ideation and childhood and adult victimization. *J Child Sex Abus.* 2002;11:49-62.
23. Davidson JR, Hughes DC, George LK, Blazer DG. The association of sexual as-

- sault and attempted suicide within the community. *Arch Gen Psychiatry*. 1996; 53:550-555.
24. Rosenberg HJ, Jankowski MK, Sengupta A, Wolfe RS, Wolford GL, Rosenberg SD. Single and multiple suicide attempts and associated health risk factors in New Hampshire adolescents. *Suicide Life Threat Behav*. 2005;35:547-557.
 25. Silverman JG, Raj A, Mucci LA, Hathaway JE. Dating violence against adolescent girls and associated substance use, unhealthy weight control, sexual risk behavior, pregnancy and suicidality. *JAMA*. 2001;286:572-579.
 26. Ackard DM, Neumark-Sztainer D. Date violence and date rape among adolescents: associations with disordered eating behaviors and psychological health. *Child Abuse Negl*. 2002;26:455-473.
 27. Kreiter SR, Krowchuk DP, Woods CR, Sinal SH, Lawless MR, DuRant RH. Gender differences in risk behaviors among adolescents who experience date fighting. *Pediatrics*. 1999;104:1286-1292.
 28. Ackard DM, Neumark-Sztainer D, Hannan P. Dating violence among a nationally representative sample of adolescent girls and boys: associations with behavioral and mental health. *J Gen Specif Med*. 2003;6:39-48.
 29. Roberts TA, Klein JD, Fisher S. Longitudinal effect of intimate partner abuse on high-risk behavior among adolescents. *Arch Pediatr Adolesc Med*. 2003;157: 875-881.
 30. Lehrer JA, Buka S, Gortmaker S, Shrier LA. Depressive symptomatology as a predictor of exposure to intimate partner violence among US female adolescents and young adults. *Arch Pediatr Adolesc Med*. 2006;160:270-276.
 31. Brener ND, Kann L, Kinchen SA, et al. Methodology of the Youth Risk Behavior Surveillance System. *MMWR Recomm Rep*. 2004;53(RR-12):1-13.
 32. Brener ND, Kann L, McManus T, Kinchen SA, Sundberg EC, Ross JG. Reliability of the 1999 Youth Risk Behavior Survey questionnaire. *J Adolesc Health*. 2002; 31:336-342.
 33. Ehrensaft MK, Moffitt TE, Caspi A. Is domestic violence followed by an increased risk of psychiatric disorders among women but not among men? a longitudinal cohort study. *Am J Psychiatry*. 2006;163:885-892.
 34. Oquendo M, Brent DA, Birmaher B, et al. Posttraumatic stress disorder comorbid with major depression: factors mediating the association with suicidal behavior. *Am J Psychiatry*. 2005;162:560-566.
 35. Dube SR, Anda RF, Whitfield CL, et al. Long-term consequences of childhood sexual abuse by gender of victim. *Am J Prev Med*. 2005;28:430-438.
 36. Thatcher WG, Reinenger BM, Drane JW. Using path analysis to examine adolescent suicide attempts, life satisfaction, and health risk behavior. *J Sch Health*. 2002;72:71-77.
 37. Beautrais AL, Joyce PR, Mulder RT. Risk factors for serious suicide attempts among youths aged 13 through 24 years. *J Am Acad Child Adolesc Psychiatry*. 1996;35:1174-1182.
 38. Bagley C, Bolitho F, Bertrand L. Mental health profiles, suicidal behavior, and community sexual assault in 2112 Canadian adolescents. *Crisis*. 1995;16:126-131.
 39. Darves-Bornoz JM, Choquet M, Ledoux S, Gasquet I, Manfredi R. Gender differences in symptoms of adolescents reporting sexual assault. *Soc Psychiatry Psychiatr Epidemiol*. 1998;33:111-117.
 40. Howard DE, Wang MO. Psychosocial correlates of US adolescents who report a history of forced sexual intercourse. *J Adolesc Health*. 2005;36:372-379.

Trial Registration Required

In concert with the International Committee of Medical Journal Editors (ICMJE), *Archives of Pediatrics and Adolescent Medicine* will require, as a condition of consideration for publication, registration of all trials in a public trials registry (such as <http://ClinicalTrials.gov>). Trials must be registered at or before the onset of patient enrollment. This policy applies to any clinical trial starting enrollment after July 1, 2005. For trials that began enrollment before this date, registration will be required by September 13, 2005, before considering the trial for publication. The trial registration number should be supplied at the time of submission.

For details about this new policy, and for information on how the ICMJE defines a clinical trial, see the editorials by DeAngelis et al in the September 8, 2004 (2004;292:1363-1364) and June 15, 2005 (2005;293: 2927-2929) issues of *JAMA*. Also see the Instructions to Authors on our Web site: www.archpediatrics.com.