Dating Aggression and Risk Behaviors Among Teenage Girls Seeking Gynecologic Care

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Abstract

Objectives: The objective was to describe rates of dating aggression and related high-risk behavior among teens presenting to the emergency department (ED) seeking gynecologic care, compared to those seeking care for other reasons.

Methods: Female patients ages 14–18 years presenting to the ED during the afternoon/evening shift of a large urban teaching hospital over a 19-month period were approached to participate and completed a self-administered computerized survey regarding sexual risk behaviors, past-year alcohol use, dating aggression, and peer aggression. Logistic regression analysis was used to identify factors associated with the evaluation of gynecologic complaint as noted by completion of a pelvic exam.

Results: A total of 949 teens were enrolled (87% response rate), with 148 receiving gynecologic evaluation. Among girls undergoing a gynecologic evaluation, 49% reported past-year dating aggression, compared to 34% of those who did not undergo gynecologic evaluation (odds ratio [OR] = 1.81, 95% confidence interval [CI] = 1.30 to 2.62). Logistic regression analysis predicting gynecologic evaluation found statistically significant variables to be older age (OR = 1.95, 95% CI = 1.24 to 3.06), African American race (OR = 1.58, 95% CI = 1.04 to 2.40), parental public assistance (OR = 1.64, 95% CI = 1.10 to 2.45), alcohol use (OR = 2.31, 95% CI = 1.57 to 3.38), and dating aggression (OR = 1.51, 95% CI = 1.03 to 2.21).

Conclusions: Of the teens undergoing gynecologic evaluation in this urban ED, 49% reported dating aggression. These teens also reported higher rates of other sexual risk behaviors compared to their peers. Care providers in urban EDs treating all female teens and particularly those seeking gynecologic care should be aware of this high rate of dating aggression and screen for aggression in dating relationships in this high-risk group.

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In an urban population, the emergency department (ED) is often the primary source of routine health care, including gynecologic care for adolescent girls.[1] An ED visit for gynecologic care may represent an opportunity to discuss prevention of high-risk behaviors including dating violence. Prior studies show that teen girls who are sexually active are at higher risk for violence, substance use, and problem behaviors.[2–5] Multiple studies have demonstrated that the ED is an appropriate setting to evaluate and intervene with adult intimate partner violence (IPV)[6,7] regardless of chief complaint.

Involvement in violent or aggressive behaviors has been shown to be part of a larger clustering of risk behaviors.[2,8] According to recent national survey data from high school students, approximately 10% to 20% of female teens report experiencing sexual or physical dating violence victimization.[2,9] Additionally, females ages 15–19 years are the victims of 5% of all homicides and 16% of nonfatal assaults.[10] The rate of dating aggression (i.e., the rate of teenage girls who committed violence toward their dating partners) presenting to the ED is unknown. Understanding prevalence of dating aggression is important and will contribute to a more complete understanding of dating violence.

This study examines dating and peer aggressive behaviors among teen girls who undergo gynecologic evaluation during their ED stay. Although the focus of this study is on committing aggressive acts in dating and peer relationships, among teen girls there is a close

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association between dating aggression and dating violence victimization, which has been termed reciprocal violence.[11] Teens who commit violent acts are at risk for victimization and further injury.[3] It is hypothesized that teenage girls age 14 to 18 years old who undergo gynecologic care may also be engaging in other high-risk behaviors and are at risk for a higher incidence of aggression or committing violence in dating relationships, compared to girls who are seeking ED care for other illness or injury.

The primary aim of this study was to examine rates of dating and peer aggression, substance use, and related high-risk behavior among adolescent females age 14 to 18 years seeking care for gynecologic complaints compared to those seeking care for other reasons. Potential risk domains were selected based on theoretical models of clustering of high-risk behavior among youth and prior findings[12] and included demographics, alcohol use, and related sexual risk behavior.

METHODS

Study Design and Population

Female teens between the ages of 14 and 18 years who presented to the ED completed a self-administered, audio-assisted, computer-based survey as part of the recruitment phase of a randomized controlled trial of an ED-based alcohol and violence intervention. Participants were recruited during the afternoon and evening shift over 19 consecutive months (September 2006–April 2008). The study site, Hurley Medical Center, is a 540-bed teaching hospital and a Level 1 trauma center located in Flint, Michigan, with an annual ED census of 75,000 patients, with 25,000 of these being pediatric patients. Hurley Medical Center is the only public hospital in the city. Flint is comparable in terms of poverty and crime to other urban centers such as Detroit, Hartford, Camden, St. Louis, and Oakland.[13] The population of Flint, and patients treated at the study hospital, is 50%–60% African American. The standard of care was that those patients with a gynecologic-related complaint (dysuria, lower abdominal pain, vaginal discharge, etc.) underwent pelvic exam.

Study procedures were approved and conducted in compliance with the Hurley Medical Center and the University of Michigan Institutional Review Boards for Human Subjects guidelines. Potential participants included both medical and injured patients who were able to give informed consent and parental assent. Patients were excluded if they were in police custody ($n = \sim 9$), had unstable vital signs ($n = \sim 53$), were actively suicidal ($n = \sim 98$), or were being treated for sexual assault ($n = \sim 27$). These numbers are estimates, as institutional review board regulations preclude recording information including sex on patients not in the study. Patients who were intoxicated were approached after they were no longer intoxicated, as noted by the care provider.

Survey Content and Administration

Surveys were administered by audio computer-assisted self-interview to ensure confidentiality, allow for complex skip patterns, and decrease literacy burden.[14–16] Participants received a token $1.00 gift (e.g., notebook, lip balm) for their participation in the screening. In rare cases (<5%) in which participants could not physically complete the survey (e.g., hold the stylus due to a broken arm), a research assistant (RA) administered the survey privately.

All measures were selected or adapted to ensure brevity and keep the time for completion of the screening questionnaire within 15 minutes. The survey was piloted prior to study implementation for both literacy and functionality with audio. The reading level was approximately fifth grade and was facilitated by audio read-over of questions. Demographic items (age, race, and academic performance) were selected from the National Study of Adolescent Health.[17] Studies have shown that violent behavior is linked to poor academic performance;[18] thus the academic performance variable was collapsed into two categories depicting failing grades (mostly Ds and Fs) and all others. Participants were asked ''Do you live with a parent or guardian'' to provide information on parental involvement and ''Do your parents, or the most important person raising you, receive public assistance'' to provide information on socioeconomic status. Participants were also asked whether they were currently working.

Sexual Risk Behaviors. Sex risk behaviors were measured with two questions from the National Longitudinal Study of Adolescent Health.[19] Participants were asked ''Have you ever had sexual intercourse?'' and ''During the past 12 months, how many people did you have sexual intercourse with?''

Alcohol Use. Alcohol use was assessed with questions that have been validated in adolescent samples.[19,20] Participants were asked to indicate whether they had consumed alcohol more than two or three times in the past 12 months.[17] For analysis, two dichotomous variables were created to reflect past year alcohol use (yes/no). In addition, the six-item Car, Relax, Alone, Forget, Friends, Trouble (CRAFFT) tool,[21] which is a previously validated screening tool used in teen populations to assess for risk for alcohol and substance use problems, was used to screen participants for alcohol consequences. Using a cutoff of 2 or higher, the CRAFFT demonstrates both sensitivity (92%) and specificity (82%) in screening adolescents for substance-related problems, with rates comparable to other, lengthier measures.[22] For this study, CRAFFT items were revised so that they were alcohol-specific and removed any reference to drug use.

Dating Aggression. Dating aggression was assessed using a collapsed version of the Conflict in Adolescent Dating Relationships Inventory,[23] which asks about fighting and aggression *towards* someone you're dating or ''going with,'' or a boyfriend or girlfriend. Physical victimization received *from* a partner was not assessed. The original four-item physical abuse/aggression subscale was collapsed into two items assessing frequency of moderate (e.g., threw something that could hurt, twisted arm or hair, pushed, shoved, grabbed,

or slapped) and severe aggression or commission of violence (e.g., punched or hit with something that could hurt, choked, slammed against a wall, beat up, burned or scalded on purpose, kicked, or used a knife or gun on). Note that to be parallel to the peer violence response, choices were modified to be identical to the Conflict Tactics Survey (CTS):[24] never, 1 time, 2 times, 3–5 times, 6–10 times, 11–20 times, and more than 20 times. The CTS is a scale used predominantly for the measurement of violence in relationships.

Nondating Aggression (Peer Aggression). Items from the CTS[24] were used to measure aggression among peers (e.g., strangers, friends) outside of dating relationships. These questions do not include fights with someone you're dating or ''going with.'' Peer violence, or nondating violence, was identified as moderate (e.g., pushed or shoved, hit or punched, slammed someone into a wall, and slapped someone) or severe (e.g., punched, slammed against a wall, kicked, or used a knife or gun on someone) consistent with CTS scoring. The CTS has been shown to be reliable and valid in adolescent samples.[25] In our sample, Chronbach's alpha for both the moderate and the severe violence composites were good (0.85 for moderate violence, 0.86 for severe violence).

Data Analysis

Data were analyzed using SAS Version 9.0 (SAS Institute, Cary, NC). Descriptive statistics of demographics, risk behaviors, and aggression were calculated for girls seeking care for gynecologic evaluation. Bivariate analyses the compared the patients who received gynecologic evaluation with those who had not received a gynecologic evaluation. Chi-square tests were used for categorical variables, and independent sample t-tests were used for continuous variables. Finally, logistic regression analyses were used to identify factors associated with evaluation of gynecologic complaint using simultaneous entry of independent variables. All significant bivariate variables were used in the multivariate analysis. For this analysis, moderate and severe dating aggression was collapsed into any dating violence. Diagnostics were run on all variables retained in the final regressions and found no evidence for multicollinearity in these analyses.

RESULTS

Overall Characteristics of Study Population

There were 1,287 female teens eligible for the study. A total of 85% of the total eligible participants (n = 1,094) were approached by an RA. There were 193 (of 1,287) potential participants missed by the RA because the RA was busy with another participant (n = 155), the patient was discharged before being approached by the RA (n = 17), the RA was unable to locate the participant (n = 18), and other (n = 5). Of those female patients approached, 87% (n = 949) completed the survey, and 13% (n = 145) declined to participate. The mean (± standard deviation [SD]) time for survey completion was 14 minutes (SD ± 9 minutes). Of all female teens surveyed, 61% (n = 577) were African American, 33% (n = 320) were white, and 6% (n = 52) were other race. Of the total sample, 31% (n = 294) received mostly Ds and Fs in school, 89% (n = 840) lived with at least one parent/guardian, and 56% (n = 534) had parents who received public assistance. Additionally, 65% (n = 618) of all teens enrolled in the study were sexually active, 6% (n = 56/949) were pregnant, and 29% (n = 270) admitted to any alcohol use. With regard to violence, 36% (n = 344) engaged in dating aggression (committed violent acts toward their dating partner) while 71% (n = 676) engaged in peer aggression (committed violent acts toward a peer). Of the girls presenting to the ED within the study enrollment period, 148 patients (16%) underwent gynecologic evaluation, and 801 (84%) did not undergo gynecologic evaluation.

Unadjusted Analysis

Demographics. Teens seeking gynecologic care were more likely to be African American (odds ratio [OR] 1.65, 95% confidence interval [CI] = 1.12 to 2.50) and have parents who received public assistance (OR = 1.53, 95% CI = 1.07 to 2.18) and were less likely to live with a parent (OR = 0.35, 95% CI = 0.17 to 0.59) than those who did not receive gynecologic evaluation. With regard to academic performance, those who received gynecologic evaluation were more likely to receive mostly Ds and Fs in school (OR = 1.49, 95% CI = 1.01 to 2.24), and there was no difference between the two groups with respect to the percentage of teens currently working.

Sexual Risk Factors. The vast majority of girls (95%, n = 140/148) who received gynecologic care reported being sexually active, compared to 60% (n = 478/801) of girls who did not receive a pelvic exam (OR = 11.7, 95% CI = 5.6 to 24.1). Of the sexually active teens who received gynecologic care, 51% (n = 72/140) reported having one sexual partner during the past 12 months, 36% (51/140) reported two to three partners, and 4% (n = 6/140) reported more than three partners. Fourteen percent (n = 20/148) of teens in the group receiving gynecologic evaluation were pregnant. Of the 56 girls who were pregnant within the total study population, 43% (n = 24) reported past-year aggression in dating relationships and 71% (n = 40) reported peer aggression.

Alcohol Use. Overall, teens seeking gynecologic care engaged in more alcohol use than those who did not receive gynecologic care. Specifically, nearly half (46%) of the teens who received gynecologic care reported any alcohol use compared to only 25% (n = 202/801) of those who did not receive gynecologic care (OR = 2.5, 95% CI = 1.8 to 3.7), and these teens were also more likely to binge drink compared to those who did not receive gynecologic care in the ED (Table 1).

Characteristics of Aggression. Of the girls receiving gynecologic care, 49% (72/148) committed violent acts toward their dating partner (dating aggression). Of those teens who noted dating aggression, 50% (36/72) were involved in severe dating aggression, and 50%

(36/72) were involved in moderate dating aggression. Teens receiving gynecologic evaluation had higher rates of moderate and severe dating aggression than those who did not receive gynecologic care (OR = 1.8, 95% CI = 1.3 to 2.6). Of note, there was no statistical difference in the rates of peer aggression between the two groups (Table 1).

Adjusted Logistic Regression Predicting Risk Factors Associated with Seeking Gynecologic Care

Using the significant variables in the crude analysis, a multivariate regression model was created ($\chi^2 = 77.42$, $p < 0.0001$). After controlling for other variables in the model, girls seeking gynecologic care in the ED were more likely to be older (OR = 1.95, 95% CI = 1.24 to 3.06), be African American (OR = 1.58, 95% CI = 1.04 to 2.40), have parents who receive public assistance (OR = 1.64, 95% CI = 1.10 to 2.45), use alcohol (OR = 2.31, 95% CI = 1.57 to 3.38), and report dating aggression (OR = 1.51, 95% CI = 1.03 to 2.21) than their peers without gynecologic evaluation (Table 2). The Hosmer and Lemeshow chi-square test of goodness of fit to test p-value (0.2970) indicates that the model's estimates fit the data at an acceptable level, and the association of predicted probabilities and observed responses was 70.3% concordant and 27.3% discordant.

Table 2
Logistic Regression Predicting ED Visit for Gynecologic Evaluation

Demographic and Risk Behaviors	Adjusted OR (95% CI), $n = 148$
Age 16–18 yr	1.95 (1.24–3.06)*
African American race	1.58 (1.04–2.40)†
Poor grades (D-F)	1.04 (0.69–1.58)
Lives with parent (yes)	0.54 (0.31–0.94)†
Public assistance (yes)	1.64 (1.10–2.45)†
Alcohol use	2.31 (1.57–3.38)‡
Dating aggression	1.51 (1.03–2.21)†

*p < 0.01.
†p < 0.05.
‡p < 0.0001.

DISCUSSION

Little is known regarding dating violence among adolescents in the ED setting. National surveys estimate that 9% to 20% of adolescents experience physical dating violence in the form of victimization, and girls who are sexually active have a higher risk of being victims of dating violence compared to girls who are not sexually active.[2,26,27] A recent survey of high school teens showed that 40% of teenage girls involved in dating relationships reported dating aggression, which was defined as perpetration of violence,[28] and girls are more likely than boys to report reciprocal aggression/victimization in dating relationships.[11] In this study, half (49%) of girls who received gynecologic evaluation in the ED reported dating aggression, which exceeds rates noted in previous studies. These high-risk youth are less likely to receive services or be screened for violence while in school because of poor attendance and are likely underrepresented in community- and school-based studies. Additionally, the aggression reported in our study population was often ''severe'' (e.g., choked, slammed against a wall, beat up, burned or scalded on

Table 1
Frequency and OR of Demographics, Substance Use, and Violence

	Gynecologic Evaluation ($n = 148$)	No Gynecologic Evaluation ($n = 801$)	Unadjusted OR (95% CI)
Demographics			
Mean age, yr (±SD)	16.9 (±1.3)	16.2 (±1.6)	1.33 (1.19–1.49)*
African American	104 (70)	473 (59)	1.65 (1.12–2.50)†
Grades, mostly D-F	57 (39)	237 (30)	1.49 (1.01–2.24)†
Currently working	39 (26)	212 (27)	1.00 (0.67–1.49)
Live with parent	115 (78)	725 (91)	0.35 (0.17–0.59)*
Public assistance (yes)	96 (65)	438 (54)	1.53 (1.07–2.18)*
Alcohol use			
Any alcohol use	68 (46)	202 (25)	2.54 (1.76–3.69)*
Binge drinking	31 (21)	98 (12)	1.90 (1.18–3.04)‡
CRAFFT > 2	16 (11)	51 (6)	1.78 (1.02–3.18)
Violence			
Any dating aggression	72 (49)	272 (34)	1.81 (1.30–2.62)‡
Moderate dating aggression	36 (24)	154 (19)	1.65 (1.07–2.55)†
Severe dating aggression	36 (24)	118 (14)	2.15 (1.38–3.36)‡
Any peer aggression	106 (72)	570 (71)	0.99 (0.68–1.51)
Moderate peer aggression	23 (16)	134 (17)	0.97 (0.56–1.69)
Severe peer aggression	83 (56)	435 (54)	1.08 (0.72–1.62)

Values are *n* (%) unless otherwise noted.
CRAFFT = Car, Relax, Alone, Forget, Friends, Trouble.
*p < 0.0001.
†p < 0.05.
‡p < 0.01.

purpose, kicked, or used a knife or gun). Further, the teens seeking ED care for nongynecologic reasons also experienced significant rates of dating aggression, with one-third (34%) noting dating aggression in the past year. Regardless of chief complaint, many teens who seek care in an urban ED participate in dating aggression. In adult studies, women who are victims of intimate partner violence are 1.5 times more likely to use the ED than women who are not involved in intimate partner violence.[29]

It is important to note that these high rates of aggression do not account for victimization and therefore may underestimate true involvement of dating violence among teens in this high-risk group. In addition, the context of the aggression is not accounted for and may be a result from the girls attempting to fight back or engage in self-defense. For example, qualitative data show that females describe dating aggression as playing, or baiting the male to hit them as a sign of commitment or love,[30] and report over half of aggressive acts are done in response to aggression initiated by their boyfriend.[31] A recent study of high school youth in high-risk communities showed that adolescents who engage in dating aggression had significantly increased odds of reporting dating victimization compared to adolescents who did not report dating violence aggression.[3]

Most female teens (70%) seeking ED care, regardless of chief complaint, reported involvement in a physical fight in the past year. These rates are substantially higher than other national samples in which 26% of adolescent girls reported involvement in a physical fight within the past year.[9] Additionally, rates of moderate violence and severe violence were similar between teens evaluated for gynecologic complaints compared to other reasons for seeking care. These data highlight the fact that female teens seeking care in urban ED settings are at high risk for future injury related to peer violence.[32]

Other community- and school-based studies have shown that adolescent females who engage in sexual risk behavior are at an increased risk of dating violence.[4] Rates of sexual risk behavior were higher in the group of adolescents that received gynecologic evaluation within this study. Approximately 6% of the total study population was pregnant, and 14% of the girls receiving gynecologic evaluation were pregnant. Of all those who were pregnant, 43% reported dating aggression. This subgroup was too small to analyze separately, and it is unknown if the violence occurred during the current pregnancy; however, pregnancy has been identified as a high-risk time for intimate partner violence among adults.[33] Additionally, homicide is the second leading cause of death among pregnant and postpartum women, with women less than 20 years of age having the highest rates of pregnancy-associated homicide.[34] Studies have shown that women who experience IPV prior to and during pregnancy have higher rates of poor maternal and fetal health outcomes.[33] Research among adolescents shows that girls who experience dating violence are more likely to become pregnant than their peers who do not experience dating violence.[2] In addition, girls who have been pregnant report higher rates of physical fighting with dating partners.[4]

This study finds that adolescent females who received a gynecologic evaluation in the ED were also more likely to drink alcohol. This is consistent with several studies demonstrating that problem behaviors tend to group together, or cluster.[12,34–38] The link between alcohol and violent behaviors is well documented, and several studies have shown that adolescents who drink alcohol are more likely to engage in violence.[39,40] Additionally, adolescents who drink alcohol are more likely to engage in high risk sexual behaviors[5] and be victims of dating violence.[2] Other studies have shown that lower parental education, and living in a single-parent house versus a dual-parent house, are associated with increased risk of dating violence.[41] National samples find that dating aggression is related to lower socioeconomic status.[41] Teens from homes where parents receive public aid are more likely to undergo gynecologic evaluation in the ED than their counterparts. These girls may have more barriers to accessing primary care clinics,[42] highlighting the need for prevention resources in the ED. However, race is often confounded by socioeconomic status,[41,43] which is difficult to measure reliably.

The ED setting is an appropriate place to screen for aggression in this population. Prior studies have shown that a large percentage of adolescents do not have a primary care physician[42] or access to outpatient clinics[44] and use the ED for routine care. Screening in community clinics or pediatric offices will often miss these individuals. These high-risk youth are less likely to receive services or be screened for violence while in school settings because of poor attendance or truancy and are likely underrepresented in community- and school-based studies. Gynecologic complaints are the second most common reason for adolescent females to access the ED.[1] ED providers should recognize the high rates of dating violence in all female teens they are treating. In addition, emergency physicians should recognize the subgroup of adolescents undergoing a gynecologic evaluation as a very-high-risk group and use this as a marker to discuss dating aggression and IPV.

LIMITATIONS

This study took place at a single-center urban ED and may not be generalizable to other nonurban ED settings. Also, this study focused on aggression, understanding that the context of the violence (self defense, etc.) is not described and that the rates of victimization without aggression may be even higher. Patients were excluded from the study if they were in police custody, being treated for sexual assault, or suicidal, which may have altered the rates of dating aggression. Although these data are based on adolescent self-report, recent reviews among adolescents and young adults have concluded that the reliability and validity of self-reported alcohol, tobacco, and other drug use is high[45–49] and that validity is impacted by cognitive and situational factors.[50] For example, adolescents are more likely to report drug use when using computerized surveys and when privacy and confidentiality is assured.[16,45,51–53]

CONCLUSIONS

This study finds that 36% of female teens 14–18 years of age seeking ED care for any reason, and nearly half of girls undergoing a gynecologic evaluation, report dating aggression. Clinicians treating teens seeking gynecologic care should consider this high rate of dating aggression and screen for dating violence. Additionally, female teens who presented with chief complaints requiring a gynecologic evaluation are participating in other high-risk behaviors such as alcohol use at much higher rates then their peers seeking care for other reasons. Future studies should concentrate on understanding the context of the aggression and should guide public health approaches, referrals, and interventions with the aim of minimizing future morbidity and mortality from aggression and violence.

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References

1. Melzer-Lange M, Lye PS. Adolescent health care in a pediatric emergency department. Ann Emerg Med. 1996; 27:633–7.
2. 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; 286:572–9.
3. Swahn MH, Simon TR, Hertz MF, et al. Linking dating violence, peer violence, and suicidal behaviors among high-risk youth. Am J Prev Med. 2008; 34:30–8.
4. 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; 104:1286–92.
5. Yan AF, Chiu YW, Stoesen CA, Wang MQ. STD/HIV-related sexual risk behaviors and substance use among U.S. rural adolescents. J Nat Med Assoc. 2007; 99:1386–94.
6. Houry D, Kaslow NJ, Kemball RS, et al. Does screening in the emergency department hurt or help victims of intimate partner violence? Ann Emerg Med. 2008; 51:433–42.
7. Rhodes KV, Lauderdale DS, He T, Howes DS, Levinson W. Between me and the computer: increased detection of intimate partner violence using a computer questionnaire. Ann Emerg Med. 2002; 40:476–84.
8. DiClemente RJ, Wingood GM, Crosby R, et al. Parental monitoring: association with adolescents' risk behaviors. Pediatrics. 2001; 107:1363–8.
9. Eaton DK, Kann L, Kinchen S, et al. Youth risk behavior surveillance–United States, 2007. MMWR Surveill Summ. 2008; 57:1–131.
10. Karch DL, Lubell KM, Friday J, Patel N, Williams DD. Surveillance for violent deaths–National Violent Death Reporting System, 16 states, 2005. MMWR Surveill Summ. 2008; 57:1–45.
11. Fang X, Corso PS. Child maltreatment, youth violence, and intimate partner violence: developmental relationships. Am J Prev Med. 2007; 33:281–90.
12. Jessor R. Risk behavior in adolescence: a psychosocial framework for understanding and action. J Adolesc Health. 1991; 12:597–605.
13. Federal Bureau of Investigation. Crime in the United States 2006: Uniform Crime Report 2006. Washington, DC: U.S. Department of Justice. Available at: http://www.fbi.gov/ucr/cius2006/index.html. Accessed Mar 6, 2009.
14. Metzger DS, Koblin B, Turner C, et al. Randomized controlled trial of audio computer-assisted self-interviewing: utility and acceptability in longitudinal studies. HIVNET Vaccine Preparedness Study Protocol Team. Am J Epidemiol. 2000; 152:99–106.
15. Murphy DA, Durako S, Muenz LR, Wilson CM. Marijuana use among HIV-positive and high-risk adolescents: a comparison of self-report through audio computer-assisted self-administered interviewing and urinalysis. Am J Epidemiol. 2000; 152:805–13.
16. Turner CF, Ku L, Rogers SM, Lindberg LD, Pleck JH, Sonenstein FL. Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. Science. 1998; 280:867–73.
17. Harris KM, Florey F, Tabor J, Bearman PS, Jones J, Udry JR. The national longitudinal study of adolescent health: research design. Available at: http://www.cpc.unc.edu/projects/addhealth/design. Accessed May 21, 2008.
18. Ellickson PL, McGuigan KA. Early predictors of adolescent violence. Am J Public Health. 2000; 90:566–72.
19. Sieving RE, Beuhring T, Resnick MD, et al. Development of adolescent self-report measures from the National Longitudinal Study of Adolescent Health. J Adolesc Health. 2001; 28:73–81.
20. Johnston L, O'Malley PM, Bachman JG, Schulenberg JE. Monitoring the Future national survey results on drug use, 1975–2006: Volume I, secondary school students (NIH Publication No. 07-6205). Bethesda, MD: National Institute on Drug Abuse, 2007.
21. Knight JR, Shrier LA, Bravender TD, Farrell M, Vander Bilt J, Shaffer HJ. A new brief screen for adolescent substance abuse. Arch Pediatr Adolesc Med. 1999; 153:591–6.
22. Knight JR, Sherritt L, Harris SK, Gates EC, Chang G. Validity of brief alcohol screening tests among adolescents: a comparison of the AUDIT, POSIT, CAGE, and CRAFFT, alcoholism: Clinical and experimental research. Alcohol Clin Exp Res 2003; 27:67–73.
23. Wolfe DA, Scott K, Reitzel-Jaffe D, Wekerle C, Grasley C, Straatman AL. Development and validation of the Conflict in Adolescent Dating Relationships Inventory. Psych Assess. 2001; 13:277–93.

24. Straus M. Measuring intrafamily conflict and violence: the conflict tactics (CT) scales. J Marriage Fam. 1979; 41:633–44.
25. Straus M. Measuring Intrafamily Conflict And Violence: The Conflict Tactics (CT) Scales, Physical Violence in American Families. New York, NY: Plenum Press, 1990.
26. Centers for Disease Control and Prevention. Physical dating violence among high school students–United States, 2003. MMWR Morb Mortal Wkly Rep. 2006; 55:532–5.
27. Halpern CT, Oslak SG, Young ML, Martin SL, Kupper LL. Partner violence among adolescents in opposite-sex romantic relationships: findings from the National Longitudinal Study of Adolescent Health. Am J Public Health. 2001; 91:1679–85.
28. O'Leary KD, Smith Slep AM, Avery-Leaf S, Cascardi M. Gender differences in dating aggression among multiethnic high school students. J Adolesc Health. 2008; 42:473–9.
29. Lipsky S, Caetano R. The role of race/ethnicity in the relationship between emergency department use and intimate partner violence: findings from the 2002 National Survey on Drug Use and Health. Am J Public Health. 2007; 97:2246–52.
30. Johnson SB, Frattaroli S, Campbell J, Wright J, Pearson-Fields AS, Cheng TL. I know what love means. Gender-based violence in the lives of urban adolescents. J Womens Health. 2005; 14:172–9.
31. Foshee VA, Bauman KE, Linder F, Rice J, Wilcher R. Typologies of adolescent dating violence: identifying typologies of adolescent dating violence perpetration. J Interpers Viol. 2007; 22:498–519.
32. Walton MA, Cunningham RM, Goldstein AL, et al. Rates and correlates of violent behaviors among adolescents treated in an urban ED. J Adolesc Health. 2009; in press.
33. Silverman JG, Decker MR, Reed E, Raj A. Intimate partner violence victimization prior to and during pregnancy among women residing in 26 U.S. states: associations with maternal and neonatal health. Am J Obstet Gynecol. 2006; 195:140–8.
34. Chang J, Berg CJ, Saltzman LE, Herndon J. Homicide: a leading cause of injury deaths among pregnant and postpartum women in the United States, 1991–1999. Am J Public Health. 2005; 95:471–7.
35. Gabriel RM, Hopson T, Haskins M, Powell KE. Building relationships and resilience in the prevention of youth violence. Am J Prev Med. 1996; 12(5 Suppl):48–55.
36. Donovan JE, Jessor R, Costa FM. Syndrome of problem behavior in adolescence: a replication. J Consult Clin Psychol. 1988; 56:762–5.
37. Irwin CE. Adolescent Social Behavior and Health: New Directions for Child Development. San Francisco, CA: Jossey Bass, 1987.
38. Irwin CE Jr, Millstein SG. Biopsychosocial correlates of risk-taking behaviors during adolescence. Can the physician intervene? J Adolesc Health Care. 1986; 7(6 Suppl):82S–96S.
39. Brewer RD, Swahn MH. Binge drinking and violence. JAMA. 2005; 294:616–8.
40. Swahn MH, Simon TR, Hammig BJ, Guerrero JL. Alcohol-consumption behaviors and risk for physical fighting and injuries among adolescent drinkers. Addict Behav. 2004; 29:959–63.
41. Foshee VA, Karriker-Jaffe KJ, Reyes HLM, et al. What accounts for demographic differences in trajectories of adolescent dating violence? An examination of intrapersonal and contextual mediators. J Adolesc Health. 2008; 42:596–604.
42. Grove DD, Lazebnik R, Petrack EM. Urban emergency department utilization by adolescents. Clin Pediatr. 2000; 39:479–83.
43. Rich JA, Sullivan LM. Correlates of violent assault among young male primary care patients. J Health Care Poor Underserv. 2001; 12:103–12.
44. Ziv A, Boulet JR, Slap GB. Emergency department utilization by adolescents in the United States. Pediatrics. 1998; 101:987–94.
45. Brener ND, Billy JO, Grady WR. Assessment of factors affecting the validity of self-reported health-risk behavior among adolescents: evidence from the scientific literature. J Adolesc Health. 2003; 33:436–57.
46. Buchan BJ, Dennis ML, Tims FM, Diamond GS. Cannabis use: consistency and validity of self-report, on-site urine testing and laboratory testing. Addiction. 2002; 97(Suppl 1):98–108.
47. Dennis M, Titus JC, Diamond G, et al. The Cannabis Youth Treatment (CYT) experiment: rationale, study design and analysis plans. Addiction. 2002; 97(Suppl 1):16–34.
48. Thornberry TP, Krohn MD. The self-report method of measuring delinquency and crime. In: Duffee D (ed). Measurement and Analysis of Crime and Justice: Criminal Justice 2000. Washington, DC: US Department of Justice, Office of Justice Programs, 2000, pp. 33–83.
49. Gray TA, Wish ED. Substance Abuse Need for Treatment among Arrestees (SANTA) in Maryland. College Park, MD: Center for Substance Abuse Research, 1998.
50. Brener ND, Billy JO, Grady WR. Assessment of factors affecting the validity of self-reported health-risk behavior among adolescents: evidence from the scientific literature. J Adolesc Health. 2003; 33:436–57.
51. Webb PM, Zimet GD, Fortenberry JD, Blythe MJ. Comparability of a computer-assisted versus written method for collecting health behavior information from adolescent patients. J Adolesc Health. 1999; 24:383–8.
52. Harrison LD, Martin SS, Enev T, Harrington D. Comparing drug testing and self-report of drug use among youths and young adults in the general population. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies, 2007.
53. Wright DL, Aquilino WS, Supple AJ. A comparison of computer-assisted and paper-and-pencil self-administered questionnaires in a survey on smoking, alcohol, and drug use. Public Opin Q. 1998; 62:331–53.