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Sexual Violence Victimization of Youth and Health Risk Behaviors

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Abstract

Introduction: This study assesses associations between past-12-month sexual violence victimization and recent health risk behaviors using a nationally representative sample of male and female high school students. It is hypothesized that sexual violence victimization will be associated with most of the negative health behaviors for both sexes.

Methods: Data from the 2017 National Youth Risk Behavior Survey, a school-based cross-sectional survey of students in Grades 9–12, were used to assess associations between sexual violence victimization and 29 health risk behaviors in sex-stratified logistic regression models. Effect modification was also examined through sex X sexual violence victimization interactions within unstratified models. All models controlled for race/ethnicity, grade, and sexual identity. Data were analyzed in 2018.

Results: Students who experienced sexual violence victimization were significantly more likely to report many health risk behaviors and experiences, such as substance use, injury, negative sexual health behaviors, feelings of sadness or hopelessness, suicidality, poor academic performance, and cognitive difficulties, and these associations were often stronger among male students (significant adjusted prevalence ratios ranged from 1.63 to 14.40 for male and 1.24 to 6.67 for female students).

Conclusions: Past-year sexual violence victimization was significantly related to various health risk behaviors, suggesting that efforts to prevent sexual violence may also be associated with decreases in poor health. Integrating violence, substance use, sexual, and other health risk prevention efforts is warranted.

INTRODUCTION

Sexual violence (SV), or nonconsensual completed/ attempted, contact/noncontact sexual activity,[1] is an urgent public health issue affecting millions of people.[2] Nationally

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representative data reveal that 1 in 5 women and 1 in 38 men have experienced completed or attempted rape (forced or alcohol/drug-facilitated penetration) in their lifetimes; 43.2% of female rape victims and 51.3% of male rape victims report their first experience occurred before age 18 years.[2] Further, 2017 data from the national Youth Risk Behavior Survey (YRBS) found that 15.2% of female and 4.3% of male high school students reported forced sexual activity the year before the survey.[3]

Several studies have connected health risk behaviors in adolescence to an SV victimization history.[4–9] For example, one study[4] found male and female adolescent SV victims were significantly more likely than nonvictims to report risky sexual behaviors (e.g., multiple sex partners and sex resulting in pregnancy). Another study[5] found that SV was associated with teenage girls' binge drinking during the past 2 weeks, drinking at an early age, past-30-day marijuana use, and having sex without using birth control. In a previous study using 2003 data from the YRBS,[6] the authors found that female high school student victims of forced sex ever in life were more likely to have used marijuana in the past 30 days and less likely to have been on a sports team than nonvictims; male student victims were more likely than nonvictims to have used cocaine in the past 30 days and to have fasted for more than 24 hours to lose weight. More recent scholarship has linked SV victimization and substance misuse. A recent YRBS study found distinct latent classes defined by varying levels of sexual and dating violence, substance use, and mental health issues, with youth who identified as sexual minorities more likely to be in the class defined by higher levels of co-occurring issues.[7] With respect to prescription drug misuse, one study linked SV victimization of adolescent girls by a peer to increased likelihood of nonmedical use of prescription drugs[8]; another found that male and female youth who used alcohol and misused prescription drugs in middle school were more likely to be SV victims in high school compared with youth who only used alcohol.[9] A third study of a national sample of high school students found that for male students, only sexual dating violence was positively associated with nonmedical use of prescription drugs, whereas experiencing both physical and sexual dating violence was positively associated with nonmedical use of prescription drugs for both sexes.[10] Although these studies as a whole suggest an association between SV victimization and substance use, sexual and mental health indicators, and academic performance, there is limited information using nationally representative samples on associations of SV victimization and motor vehicle–related risky behaviors (e.g., texting and driving) or other concerning health experiences (e.g., being overweight or obese). There are also limited studies that examine recent SV victimization, defined broadly, and the association with recent health behaviors.

This paper builds on previous work using 2017 YRBS data and examines associations between a broad measure of past-12-month adolescent SV victimization and a range of negative health behaviors, including substance use, injury, sexual health, motor vehicle–related risky behaviors, and other risky behaviors. The previous research[6] that this study builds on assessed adolescent lifetime forced sex and health risks. In this study, recall bias is limited by focusing on SV during the past 12 months to test the association of recent SV victimization and health risk among adolescents, and SV victimization is broadened to include experiences beyond forced penetration. Moreover, this study assesses associations separately for male and female youth and tests for statistically significant differences by sex

between SV victimization and health risk behaviors. Based on previous research, the hypothesis is that SV victimization will be positively associated with the following negative health behaviors for both sexes: substance use, sexual and mental health indicators, and low academic performance. Given the lack of previous research on motor vehicle–related behaviors, sports team participation, cognitive difficulties, and obesity, those potential associations with SV victimization are exploratory.

METHODS

Study Population

The Centers for Disease Control and Prevention has conducted the YRBS biennially since 1991. The YRBS is a school-based cross-sectional survey that uses an independent 3-stage cluster sampling design to obtain estimates that are nationally representative of public and private school students in Grades 9–12 in all 50 states and the District of Colombia.[11] Participation in the YRBS is both anonymous and voluntary and adheres to local parental permission requirements. High school students complete a self-administered questionnaire, recording their responses on a computer-scannable questionnaire booklet during a regular class period. In 2017, the school-level response rate of the YRBS was 75.0%, the student-level response rate was 80.6%, and the overall response rate was 60.4%.[3] The 2017 YRBS sample size was 14,765 students.[3] YRBS data are weighted to adjust for nonresponse at both the school and student levels, as well as to account for the oversampling of black and Hispanic students. More detailed information on both the psychometric properties of the YRBS questionnaire, as well as the YRBS sampling strategies, has been published elsewhere.[11,12] The national YRBS was reviewed and approved by a Centers for Disease Control and Prevention IRB in Atlanta, GA.

Measures

The exposure variable of interest, SV victimization, was assessed with the question: *During the past 12 months, how many times did anyone force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse)*. Response options were collapsed into 2 categories, *zero times* versus *one or more times*. Analyses included 29 health risk behavior outcome variables from the domains of substance use (e.g., current alcohol use, current use of electronic vapor products, and ever misused prescription pain medicine), motor vehicle–related risky behaviors (e.g., driving while using marijuana and driving while using alcohol), sexual health (e.g., currently sexually active and no condom use at last sexual intercourse), and other concerning health risk behaviors (e.g., suicidal thoughts, planning, or attempts and poor academic performance) to determine if they were associated with SV victimization. More detailed information for each health risk behavior included in each domain, with exact questionnaire wording and analytic coding, is outlined in Table 1.

Demographic characteristics assessed in this analysis included sex (male or female), grade (9th, 10th, 11th, and 12th), race/ethnicity (white, non-Hispanic; black, non-Hispanic; and Hispanic), and sexual identity (heterosexual, gay or lesbian, bisexual, and not sure). The

other race/ethnicity category is not presented in data tables owing to limited interpretability of the subgroup.

Statistical Analysis

Data were analyzed in 2018. To account for the complex sample design of the survey, all analyses were conducted using SAS (version 9.4) callable SUDAAN (version 11.0.1 build 326). All analyses were stratified by sex, as previous literature has demonstrated sex differences in the prevalence and experiences of SV victimization and other health risk behaviors.[3,6] First, significant differences in demographic characteristics (i.e., race/ethnicity, grade, and sexual identity) were explored by sex using the chi-square test. Second, a sex-stratified analysis of associations between demographic characteristics and SV victimization was conducted using the chi-square test. These bivariable analyses were conducted to provide information on how demographic characteristics may vary by sex and to explore potential sex differences in demographic characteristics among students who experienced SV. Last, associations were assessed between SV victimization and 29 health risk behaviors outcomes in separate sex-stratified logistic regression models, which generated adjusted prevalence ratios and corresponding 95% CIs. To provide further evidence for the decision to stratify by sex, potential effect modification was explored among the outcome variables by including a sex X SV victimization variable within models not stratified by sex.

All regression models included race/ethnicity, grade, and sexual identity as covariates. Sexual identity was included as a covariate as prior research has demonstrated substantial variation in prevalence of violence victimization and other health risk behaviors by sexual identity.[3] Though the race/ethnicity group *other* is not presented in tables and the text because of limited interpretability, the group was included in all analyses. To account for the potential error introduced by performing multiple comparisons, a Bonferroni correction (α=0.05/29) was performed, which resulted in a new p-value for significance of main effect measures (SV victimization) at α=0.002.

RESULTS

Of 3 demographic characteristics (race/ethnicity, grade, and sexual identity) compared by sex, only sexual identity varied significantly (Table 2). Specifically, a greater portion of female than male students were bisexual (13.1% vs 2.8%). When comparing associations between demographic characteristics and experiences of SV victimization by sex, some important sex differences were observed (Table 3). A greater proportion of male students who experienced SV victimization during the past 12 months identified as gay, bisexual, or not sure than nonvictims, and nearly twice as many female students who experienced past-year SV victimization identified as bisexual than nonvictims. Additionally, more female students who had experienced past-year SV victimization were white compared with nonvictims.

Table 4 presents bivariate and adjusted models showing sex-stratified associations for SV victimization in the past 12 months and various health risk behaviors. Regardless of sex, students who reported experiencing SV victimization during the past 12 months were more likely to report most of the risk behaviors compared with students who had not experienced

SV victimization, though differences were more pronounced for male students. Further, accounting for race/ethnicity, grade, and sexual identity only slightly reduced many of these associations. Significant effect modification by sex was observed for 13 of 29 health risk behaviors.

In adjusted models, both male and female students who experienced SV victimization in the past 12 months were significantly more likely than those who did not experience SV victimization to report all substance use behaviors (Table 4). Specifically, they were more likely than nonvictims to report currently using alcohol, marijuana, electronic vapor products, and cigarette smoking. Past-year victims were also more likely than nonvictims to report ever using all types of illicit drugs and ever misusing prescription pain medicine. For some substance use behaviors, the magnitude of the association between victims and nonvictims was significantly higher among male students, as evidenced by significant sex X SV interactions for 9 of the 13 substance use items (signified by an asterisk next to the behavior name in Table 4).

Similar associations were observed for all motor vehicle–related risky behaviors. Both male and female students who experienced SV victimization during the past 12 months were more likely than nonvictims to report riding with a driver who had been drinking alcohol, driving when drinking alcohol, driving while using marijuana, and texting/e-mailing while driving; however, the magnitude of these 4 associations was significantly greater among male students compared with female students. In addition, male SV victims (but not female victims) were more likely than nonvictims to report rarely or never wearing a seat belt, although the interaction by sex was not significant.

Of 5 sexual health behaviors, 4 were significantly associated with past-year SV victimization for male students and 3 of 5 for female students. Both male and female victims were more likely than nonvictims to report ever having sex, having 4 or more sexual partners during their life, and being sexually active with 1 or more people in the past 3 months. Among male students who were currently sexually active, victims were more likely than nonvictims to use alcohol/drugs before their last sexual intercourse. No significant differences between victims and nonvictims who were currently sexually active were observed for condom use during last sexual intercourse.

Differences were also observed for other health risk behaviors and experiences between male and female victims and nonvictims. Both male and female students who had experienced SV victimization in the past 12 months were more likely than nonvictims to report persistent feelings of sadness or hopelessness during the past year; suicidal thoughts, planning, or behaviors during the past year; and cognitive difficulties. Female SV victims were more likely than nonvictims to report poor academic performance during the past year. No significant differences between victims and nonvictims were found for sports team involvement or being overweight or obese for either male or female students.

DISCUSSION

This study fills gaps by describing concurrent associations between recent SV victimization and health risk behaviors among a nationally representative sample of U.S. high school students. Male and female students who experienced SV victimization were significantly more likely to report substance use behaviors; motor vehicle–related risk behaviors; sexual health behaviors; and other health risk behaviors and experiences including feelings of sadness/hopelessness, suicidality, and cognitive difficulties, after controlling for demographic characteristics. Condom use, obesity, and sports involvement did not differ significantly between victims and nonvictims for either sex. Overall, the relationships between SV victimization and health risk behaviors were similar for male and female students. However, some sex differences in the strength of the association between victims and nonvictims for injury and substance use behaviors were observed, with male victim status tending to have stronger associations with these variables.

These findings support previous studies describing associations between SV victimization and substance use[5–8] and sexual health behaviors[4] among adolescents and also extend previous research by finding associations between adolescent SV and longer-term outcomes like psychological problems, suicidality, injury, and poor academic performance. These findings also build on an earlier study that found associations between lifetime forced sexual intercourse and health risk behaviors[6] by assessing more recent SV victimization inclusive of multiple forms of SV (i.e., being forced to do sexual things such as kissing, touching, or intercourse). Further, these findings bring attention to health risk behaviors not previously examined in relation to adolescent SV victimization—driving/driving with someone under the influence of drugs or alcohol, texting while driving, cognitive difficulties, not wearing a seat belt (male students only), and low academic performance (female students only). These are important factors to consider in prevention efforts.

The sex differences found in this study also support prior research[6,10] suggesting that the patterns of association of health correlates to SV victimization differ by sex. Though male high school students report lower prevalence of SV victimization than female students consistently in the literature, there is less scholarship about the male victimization experience. The present study suggests that the association between SV victimization and heightened risk for substance use and motor vehicle–related risk behaviors (e.g., drinking and driving) is often even stronger for male students. These findings suggest that primary prevention efforts with youth might benefit from focusing on the increased likelihood for overlap of SV victimization with these other health risk behaviors for male students in particular. For instance, focused SV prevention efforts with male students may reduce engagement in health risk behaviors, whereas assessments of risk behaviors may help identify students who have experienced, or are at risk for, SV victimization. Interestingly, the pronounced findings for male victims cannot be explained by sexual minority status, given this was controlled for in analysis. Greater attention to the adolescent male experience of SV victimization seems warranted given these findings.

The mechanisms that explain why SV and health risk behaviors may be associated are unclear. It could be that involvement in health risk behaviors puts adolescents at risk for

violence victimization.[5] This is consistent with problem behavior theory, which posits that adolescent developmental and social opportunities can result in a clustering of health risk behaviors that overlap with SV victimization.[5,13] Alternatively, experiences of SV may increase engagement in health risk behaviors, such as substance use and sexual risk taking, as a means to cope with victimization, which has been theoretically conceptualized[14,15] and supported in previous research.[16] There is evidence that adverse childhood experiences, including SV, lead to a stress response that can change the architecture of the brain and, subsequently, behavioral and psychological responses.[17] It is possible that recent adolescent SV victimization coupled with a previous history of sexual abuse may be driving the association with health risk behaviors for some youth, which is supported by prior research.[18] Future longitudinal studies that collect information about the pathways and mechanisms through which early childhood trauma, including child sexual abuse, adolescent SV, and health behaviors, are related are needed to better elucidate these associations.

Limitations

Although this study is the first to present nationally representative data on the association between past-year SV victimization and health risk behaviors across several domains, there are some limitations. First, data on the health risk behaviors and experiences that are ascertained by the YRBS are self-reported; therefore, it is not possible to determine the extent to which under-reporting or over-reporting of behaviors occurred. However, previous studies have shown that many of the YRBS questions generally demonstrate good test–retest reliability.[11,12] Second, the results are not representative of all youth in this age group, as the data apply only to youth who attend high school. In a 2013 national study, it was estimated that 5% of individuals aged 16–17 years had not completed high school and were not enrolled in a high school program.[19] Third, timeframes used to assess the health risk behaviors varied and ranged from the last 30 days to lifetime; thus, the possibility of some recall bias in the results cannot be discounted. Finally, because the YRBS is a cross-sectional survey, it is not possible to determine the direction of the associations between SV victimization and the health risk behaviors.

CONCLUSIONS

This study is the first known to the authors to present nationally representative data on the association between past-year SV victimization and various health risk behaviors related to substance use, injury, sexual health, and other risky behaviors. Findings suggest that SV prevention efforts may be more efficient, effective, or impactful on overall health for male and female youth if they also focus on co-occurring risk behaviors. Substance use and injury prevention may be especially important content for male youth, particularly male SV victims. Early (i.e., before high school) primary prevention efforts may be beneficial to prevent SV and health risk behaviors. Comprehensive violence prevention strategies based on the best available evidence and that address factors such as sexual health and substance use behaviors may be most useful.[20]

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REFERENCES

1. Basile KC, Smith SG, Breiding MJ, Black MC, Mahendra RR. Sexual Violence Surveillance: Uniform Definitions and Recommended Data Elements, Version 2.0. Atlanta, GA: National Center for Injury Prevention and Control, CDC; 2014 www.cdc.gov/violenceprevention/pdf/sv_surveillance_definitionsl-2009-a.pdf. Published 2014. Accessed December 5, 2019.
2. Smith SG, Zhang X, Basile KC, et al. The National Intimate Partner and Sexual Violence Survey (NISVS): 2015 data brief – updated release. Atlanta, GA: National Center for Injury Prevention and Control, CDC www.cdc.gov/violenceprevention/datasources/nisvs/2015NISVSdatabrief.html. Published November 2018. Accessed December 5, 2019.
3. Kann L, McManus T, Harris WA, et al. Youth Risk Behavior Surveillance — United States, 2017. MMWR Surveill Summ. 2018;67(8):1–114. 10.15585/mmwr.ss6708a1.
4. Raj A, Silverman JG, Amaro H. The relationship between sexual abuse and sexual risk among high school students: findings from the 1997 Massachusetts Youth Risk Behavior Survey. Matern Child Health J. 2000;4(2):125–134. 10.1023/A:1009526422148. [PubMed: 10994581]
5. Champion HLO, Foley KL, Durant RH, Hensberry R, Altman D, Wolfson M. Adolescent sexual victimization, use of alcohol and other substances, and other health risk behaviors. J Adolesc Health. 2004;35(4):321–328. 10.1016/j.jadohealth.2003.09.023. [PubMed: 15450546]
6. Basile KC, Black MC, Simon TR, Arias I, Brener ND, Saltzman LE. The association between self-reported lifetime history of forced sexual intercourse and recent health-risk behaviors: findings from the 2003 National Youth Risk Behavior Survey. J Adolesc Health. 2006;39(5):752.e1–752.e7. 10.1016/j.jadohealth.2006.06.001.
7. Nelon JL, De Pedro KT, Gilreath TD, Patterson MS, Holden CB, Esquivel CH. A latent class analysis of the co-occurrence of sexual violence, substance use, and mental health in youth. Subst Use Misuse. 2019;54(12):1938–1944. 10.1080/10826084.2019.1618337. [PubMed: 31131676]
8. Young A, Grey M, Boyd CJ, McCabe SE. Adolescent sexual assault and the medical and nonmedical use of prescription medication. J Addict Nurs. 2011;11(1–2):25–31. 10.3109/10884601003628138. [PubMed: 22065397]
9. Espelage DL, Davis JP, Basile KC, Rostad WL, Leemis RW. Alcohol, prescription drug misuse, sexual violence, and dating violence among high school youth. J Adolesc Health. 2018;63(5):601–607. 10.1016/j.jadohealth.2018.05.024. [PubMed: 30172675]
10. Clayton HB, Lowry R, Basile KC, Demissie Z, Bohm MK. Physical and sexual dating violence and nonmedical use of prescription drugs. Pediatrics. 2017;140(6):e20172289 10.1542/peds.2017-2289. [PubMed: 29158227]
11. Centers for Disease Control and Prevention, Brener ND, Kann L, et al. Methodology of the youth risk behavior surveillance system –2013. MMWR Morb Mortal Wkly Rep. 2013;62 (RR-1):1−23. https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6201a1.htm. Accessed December 5, 2019. [PubMed: 23302815]
12. 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(4):336–342. 10.1016/s1054-139x(02)00339-7. [PubMed: 12359379]
13. Jessor R, Jessor SL. Problem Behavior and Psychosocial Development. New York, NY: Academic Press, 1977.
14. Finkelhor D, Browne A. The traumatic impact of child sexual abuse: a conceptualization. Am J Orthopsychiatry. 1985;55(4):530–541. 10.1111/j.1939-0025.1985.tb02703.x. [PubMed: 4073225]
15. Polusny MA, Follette VM. Long-term correlates of child sexual abuse: theory and a review of the empirical literature. Appl Prev Psychol. 1995;4(3):143–166. 10.1016/S0962-1849(05)80055-1.

16. Kilpatrick DG, Acierno R, Saunders B, Resnick HS, Best CL, Schnurr PP. Risk factors for adolescent substance abuse and dependence: data from a national sample. J Consult Clin Psychol. 2000;68(1):19–30. 10.1037//0022-006x.68.1.19. [PubMed: 10710837]

17. Shonkoff JP, Boyce WT, McEwen BS. Neuroscience, molecular biology, and the childhood roots of health disparities: building a new framework for health promotion and disease prevention. JAMA. 2009;301(21):2252–2259. 10.1001/jama.2009.754. [PubMed: 19491187]

18. Boney-McCoy S, Finkelhor D. Prior victimization: a risk factor for child sexual abuse and for PTSD-related symptomatology among sexually abused youth. Child Abuse Negl. 1995;19(12):1401–1421. 10.1016/0145-2134(95)00104-9. [PubMed: 8777692]

19. McFarland J, Stark P, Cui J. Trends in high school dropout and completion rates in the United States: 2013 (NCES 2016–117). Washington, DC: U.S. Department of Education, National Center for Education Statistics; 2016 https://nces.ed.gov/pubs2016/2016117rev.pdf. Accessed December 5, 2019.

20. Basile KC, DeGue S, Jones K, et al. STOP SV: A technical package to prevent sexual violence. Atlanta, GA: National Center for Injury Prevention and Control, CDC; 2016 www.cdc.gov/violenceprevention/pdf/sv-prevention-technical-package.pdf. Published 2016 Accessed December 5, 2019.

Table 1.

Health Risk Behaviors Studied in Association With Sexual Victimization

Health risk behavior	Questionnaire item	Analytic coding
Substance use		
Current alcohol use	During the past 30 days, on how many days did you have at least one drink of alcohol?	≥1 vs 0 days
Current marijuana use	During the past 30 days, how many times did you use marijuana?	≥1 vs 0 times
Current cigarette smoking	During the past 30 days, on how many days did you smoke cigarettes?	≥1 vs 0 times
Current use of electronic vapor products	During the past 30 days, on how many days did you use an electronic vapor product?	≥1 vs 0 times
Ever misused prescription pain medicine	During your life, how many times have you taken prescription pain medicine without a doctor's prescription or differently than how a doctor told you to use it?	≥1 vs 0 times
Ever used synthetic marijuana	During your life, how many times have you used synthetic marijuana (also called K2, Spice, fake weed, King Kong, Yucatan Fire, Skunk, or Moon Rocks)?	≥1 vs 0 times
Ever used inhalants	During your life, how many times have you sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?	≥1 vs 0 times
Ever used cocaine	During your life, how many times have you used any form of cocaine, including powder, crack, or freebase?	≥1 vs 0 times
Ever used heroin	During your life, how many times have you used heroin (also called smack, junk, or China White)?	≥1 vs 0 times
Ever used methamphetamines	During your life, how many times have you used methamphetamines (also called speed, crystal, crank or ice)?	≥1 vs 0 times
Ever used ecstasy	During your life, how many times have you used ecstasy (also called MDMA)?	>1 vs 0 times
Ever used hallucinogenic drugs	During your life, how many times have you used hallucinogenic drugs, such as LSD, acid, PCP, angel dust, mescaline, or mushrooms?	>lvs0 times
Ever injected any illegal drug	During your life, how many times have you used a needle to inject any illegal drug into your body?	≥1 vs 0 times
Motor vehicle—related risky behaviors		
Rarely or never wore a seat belt	How often do you wear a seat belt when riding in a car driven by someone else?	Yes vs no
Rode with a driver who had been drinking alcohol	During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?	Yes vs no
Drove a car or other vehicle when drinking alcohol	During the past 30 days, how many times did you drive a car or other vehicle when you had been drinking alcohol?	Yes vs no
Drove while using marijuana	During the past 30 days, how many times did you drive a car or other vehicle when you had been using marijuana (also called grass, pot, or weed)?	≥1 vs 0 times
Texted or e-mailed while driving a car	During the past 30 days, on how many days did you text or e-mail while driving a car or other vehicle?	Yes vs no
Sexual health		
Ever had sexual intercourse	Have you ever had sexual intercourse?	Yes vs no
Had sexual intercourse with 4 or more persons during their life	During your life, with how many people have you had sexual intercourse?	≥4 vs <4 persons
Currently sexually active	During the past 3 months, with how many people did you have sexual intercourse?	≥1 vs 0 persons

Health risk behavior	Questionnaire item	Analytic coding
No condom use during last sexual intercourse	The last time you had sexual intercourse, did you or your partner use a condom? *(excludes students who were not currently sexually active)*	No vs yes
Drank alcohol or use drugs before last sexual intercourse	Did you drink alcohol or use drugs before you had sexual intercourse the last time? *(excludes students who were not currently sexually active)*	Yes vs no
Other concerning health risks or behaviors		
Persistent feelings of sadness or hopelessness	During the past 12 months, did you ever feel so sad or hopeless almost every day for 2 weeks or more in a row that you stopped doing some usual activities?	Yes vs no
Suicidal thoughts, planning, or attempts	Any "yes" response to one or more of the following behaviors in the past 12 months: seriously considered attempting suicide, made a plan to attempt suicide, and attempted suicide	Yes vs no
Poor academic performance	During the past 12 months, how would you describe your grades in school?	Mostly Ds and Fs vs Mostly As, Bs, and Cs
Did not play on a sports team	During the past 12 months, on how many sports teams did you play?	0 teams vs ≥1 teams
Cognitive difficulties	Because of a physical, mental, or emotional problem, do you have serious difficulty concentrating, remembering, or making decisions?	Yes vs no
Overweight or obese	BMI calculated with responses to 2 questions: how tall are you without your shoes on? How much do you weigh without your shoes on?[a]	≥85th percentile vs <85th percentile

[a] $BMI=kg/m^2=Weight\ (in\ kg)/(Height\ [in\ m]^2)$ BMI, along with respondents' age and sex are used to determine a BMI percentile based on comparison with the 2000 CDC Growth Charts. The technical documentation for BMI percentile can be viewed at: www.cdc.gov/nccdphp/dnpao/growthcharts/resources/sas.htm.

Table 2.

Demographic Characteristics by Sex, Among U.S. High School Students - National Youth Risk Behavior Survey, 2017

	Males (*n*=7,112)		Females (*n*=7,526)		
Demographic characteristics	***n***	**% (95% CI)**	***n***	**% (95% CI)**	***p*-value**
Race/ethnicity[a]					0.0894
White[b]	2,999	52.6 (47.6, 57.5)	3,245	54.3 (48.3, 60.2)	
Black[b]	1,348	13.6 (11.0, 16.7)	1,442	13.3 (10.9, 16.1)	
Hispanic	1,777	23.8 (20.3, 27.8)	1,857	21.9 (18.0, 26.4)	
Grade					0.6660
9	1,891	27.7 (26.0, 29.4)	2,015	26.9 (25.1, 28.9)	
10	1,786	25.7 (24.0, 27.4)	1,918	25.7 (24.6, 26.9)	
11	1,777	23.9 (22.7, 25.1)	1,812	24.0 (23.0, 25.0)	
12	1,616	22.8 (21.4, 24.3)	1,757	23.4 (21.9, 24.9)	
Sexual identity					**<0.0001**
Heterosexual	6,195	91.5 (90.4, 92.5)	5,741	79.6 (77.5, 81.5)	
Gay or lesbian	157	2.3 (1.6, 3.3)	190	2.3 (1.9, 2.8)	
Bisexual	199	2.8 (2.3, 3.5)	914	13.1 (11.6, 14.9)	
Not sure	227	3.3 (2.8, 4.1)	366	5.0 (4.2, 5.9)	

Note: Boldface indicates statistical significance ($p<0.05$).

[a]Race/ethnicity *other* not presented because of limited interpretability.

[b]Non-Hispanic.

Table 3.

Sexual Violence Victimization Past 12 Months by Demographic Characteristics, U.S. High School Students - YRBS, 2017

	Experienced sexual violence victimization[a]					
	Males			Females		
Demographic characteristics	**No %**	**Yes %**	**χ^2 p-value**	**No %**	**Yes %**	**χ^2 p-value**
Race/ethnicity[b]			0.1400			**<0.001**
White[c]	52.7	44.7		51.6	56.9	
Black[c]	13.4	18.9		14.6	10.0	
Hispanic	23.9	24.3		23.0	22.7	
Grade			0.5565			0.7430
9	27.7	24.6		27.0	26.1	
10	25.7	26.8		25.7	26.0	
11	24.0	23.5		23.7	25.6	
12	22.5	25.1		23.7	22.4	
Sexual identity			**<0.0001**			**<0.001**
Heterosexual	92.9	68.2		81.4	70.7	
Gay or lesbian	1.8	10.9		2.4	2.1	
Bisexual	2.3	12.3		11.5	21.1	
Not sure	3.0	8.6		4.7	6.1	

Note: Boldface indicates statistical significance ($p<0.05$). n=14,036; Males=6,888, Females=7,148.

[a] During the 12 months before the survey.

[b] Non-Hispanic.

[c] Race/ethnicity *other* not presented because of limited interpretability.

YRBS, Youth Risk Behavior Survey.

Table 4.

Prevalence of Health Risk Behaviors by Sexual Violence Victimization and Sex, U.S. High School Students

	Experienced sexual violence victimization							
	Males				Females			
Behavioral health domain	**No %**	**Yes %**	**PR (95% CI)**	**APR (95% CI)**	**No %**	**Yes %**	**PR (95% CI)**	**APR (95% CI)**
Substance use								
Current alcohol use[a]	26.2	49.9	1.90 (1.58, 2.29)	**1.91 (1.56, 2.34)**	29.0	51.1	1.76 (1.59, 1.96)	**1.71 (1.54, 1.91)**
Current marijuana use[a,b]	18.6	47.1	2.53 (2.14, 3.00)	**2.54 (2.13, 3.03)**	17.6	34.2	1.94 (1.69, 2.23)	**1.84 (1.59, 2.14)**
Current cigarette smoking[a,b]	8.5	36.2	4.27 (3.34, 5.46)	**4.15 (3.34, 5.15)**	6.4	16.1	2.51 (1.97, 3.20)	**2.15 (1.64, 2.81)**
Current use of electronic vapor products[a]	14.5	39.9	2.74 (2.20, 3.41)	**2.91 (2.34, 3.62)**	8.2	23.5	2.85 (2.31, 3.53)	**2.60 (2.08, 3.26)**
Ever misused prescription pain medicine	12.0	41.1	3.42 (2.48, 4.70)	**3.14 (2.31, 4.28)**	11.7	29.1	2.48 (2.12, 2.89)	**2.27 (1.91, 2.69)**
Ever used synthetic marijuana[b]	6.0	34.5	5.77 (4.35, 7.64)	**5.12 (3.78, 6.94)**	4.8	14.8	3.11 (2.31, 4.19)	**2.65 (1.90, 3.70)**
Ever used inhalants[b]	4.5	32.0	7.05 (5.61, 8.85)	**5.98 (4.60, 7.78)**	4.7	14.7	3.13 (2.41, 4.07)	**2.73 (2.09, 3.56)**
Ever used cocaine[b]	4.6	34.0	7.42 (5.43,10.13)	**6.75 (4.87, 9.38)**	2.5	8.9	3.57 (2.75, 4.64)	**3.01 (2.28, 3.98)**
Ever used heroin[b]	1.3	22.9	17.58 (11.49, 26.88)	**13.44 (8.49, 21.28)**	0.4	3.4	7.70 (4.14, 14.29)	**6.67 (3.53, 12.60)**
Ever used methamphetamines[b]	2.2	25.1	11.57 (8.07,16.59)	**8.58 (5.89, 12.48)**	0.8	5.0	6.26 (3.93, 9.96)	**4.91 (2.85, 8.48)**
Ever used ecstasy[b]	3.8	26.8	6.98 (5.16, 9.43)	**5.75 (4.38, 7.54)**	2.0	8.3	4.21 (2.79, 6.35)	**3.55 (2.35, 5.37)**
Ever used hallucinogenic drugs[b]	6.5	34.0	5.27 (3.95, 7.05)	**4.72 (3.50, 6.36)**	4.1	12.6	3.10 (2.18, 4.40)	**2.50 (1.72, 3.61)**
Ever injected any illegal drug	1.1	19.3	17.74 (11.38, 27.68)	**14.40 (9.08, 22.84)**	0.4	3.0	7.10 (2.97, 17.01)	**6.02 (2.29, 15.78)**
Motor vehicle-related risky behaviors								
Rarely or never wore a seat belt	5.8	16.4	2.82 (1.97, 4.04)	**2.72 (1.78, 4.16)**	4.7	8.6	1.83 (1.26, 2.65)	1.84 (1.17, 2.89)
Rode with a driver who had been drinking alcohol[b,c]	14.2	37.9	2.67 (2.31, 3.09)	**2.57 (2.17, 3.05)**	15.3	27.4	1.79 (1.53, 2.10)	**1.76 (1.50, 2.07)**
Drove a car or other vehicle when drinking alcohol[b,c,d]	5.7	26.5	4.60 (3.10, 6.85)	**4.69 (3.15, 6.99)**	3.0	9.1	2.98 (1.79, 4.96)	**2.70 (1.64, 4.45)**
Drove while using marijuana[b,c,d]	12.7	46.1	3.62 (2.85, 4.61)	**3.50 (2.76, 4.43)**	9.1	23.3	2.57 (2.09, 3.17)	**2.41 (1.92, 3.04)**
Texted or e-mailed while driving a car[b,c,d]	36.4	56.5	1.55 (1.34, 1.80)	**1.63 (1.40, 1.90)**	38.9	48.8	1.25 (1.10, 1.43)	**1.24 (1.10,1.40)**
Sexual health								
Ever had sexual intercourse	39.9	66.8	1.68 (1.47,1.91)	**1.66 (1.43, 1.93)**	33.0	60.7	1.84 (1.69, 2.00)	**1.79 (1.65, 1.94)**

	Experienced sexual violence victimization							
	Males				Females			
Behavioral health domain	**No %**	**Yes %**	**PR (95% CI)**	**APR (95% CI)**	**No %**	**Yes %**	**PR (95% CI)**	**APR (95% CI)**
Had sexual intercourse with 4 or more persons during their life	10.4	33.9	3.26 (2.39, 4.45)	**3.13 (2.23, 4.39)**	5.9	18.1	3.06 (2.45, 3.81)	**2.73 (2.21, 3.38)**
Currently, sexually active[e]	27.2	54.2	1.99 (1.63, 2.43)	**2.04 (1.66, 2.51)**	25.6	44.2	1.73 (1.48, 2.02)	**1.67 (1.44,1.94)**
No condom use during last sexual intercourse[f]	38.4	43.9	1.14 (0.81, 1.61)	1.13 (0.83, 1.53)	51.9	54.9	1.06 (0.94, 1.18)	1.06 (0.94, 1.19)
Drank alcohol or use drugs before last sexual intercourse[f]	20.1	40.6	2.02 (1.53, 2.67)	**1.85 (1.39, 2.46)**	13.6	23.0	1.69 (1.29, 2.22)	1.54 (1.14, 2.09)
Other concerning health risks or behaviors								
Persistent feelings of sadness or hopelessness[g]	19.7	48.1	2.44 (2.03, 2.94)	**2.07 (1.63, 2.63)**	36.5	71.4	1.95 (1.84, 2.08)	**1.89 (1.77, 2.01)**
Suicidal thoughts, planning, or attempts	15.5	56.3	3.63 (3.01, 4.37)	**2.93 (2.25, 3.82)**	23.8	55.8	2.34 (2.13, 2.58)	**2.17 (1.97, 2.39)**
Poor academic performance[g]	29.7	40.2	1.35 (1.09, 1.69)	1.33 (1.07, 1.66)	19.6	26.5	1.35 (1.20, 1.52)	**1.28 (1.14, 1.44)**
Did not play on a sports team[g]	40.6	35.8	0.88 (0.72, 1.09)	0.79 (0.61, 1.01)	49.2	46.6	0.95 (0.86, 1.05)	0.92 (0.83, 1.02)
Cognitive difficulties	23.9	51.5	2.15 (1.89, 2.46)	**1.89 (1.63, 2.20)**	35.0	63.3	1.81 (1.67, 1.96)	**1.72 (1.57, 1.88)**
Overweight or obese	31.9	29.4	0.92 (0.75, 1.13)	0.87 (0.70, 1.08)	29.3	31.2	1.06 (0.93, 1.22)	1.03 (0.88, 1.20)

Note: Boldface indicates APR met the criteria for Bonferroni adjustment, α=0.05/29=0.002.

[a]On at least 1 day during the 30 days before the survey.

[b]Indicates significant sex X SV victimization.

[c]One or more times during the last 30 days.

[d]Among students who reported driving a car in the 30 days before the survey.

[e]With one or more persons during the past 3 months.

[f]Among students who were currently sexually active.

[g]During the 12 months before the survey.

APR, adjusted prevalence ratio; PR, prevalence ratio; SV, sexual violence.