



Published in final edited form as:

J Interpers Violence. 2022 January ; 37(1-2): 151–171. doi:10.1177/0886260520908028.

Sexual violence perpetration as a risk factor for current depression or post-traumatic symptoms in adolescents

Amy L. Meadows,

University of Kentucky College of Medicine, Department of Psychiatry and Pediatrics, 245 Fountain Court, Lexington KY 40509

Ann L. Coker,

University of Kentucky, College of Medicine/OBGYN, 800 Rose Street Lexington, KY 40506 USA

Heather M. Bush,

University of Kentucky, College of Public Health, 725 Rose Street, Lexington, KY 40536 USA

Emily R. Clear,

University of Kentucky, College of Arts & Sciences, 725 Rose Street, Lexington, KY 40536 USA

Ginny Sprang,

University of Kentucky, College of Medicine/Department of Psychiatry, 3470 Blazer Parkway, Suite 100, Lexington KY 40509

Candace J. Brancato

University of Kentucky, College of Arts & Sciences, 725 Rose Street Lexington, KY 40536 USA

Abstract

Sexual violence perpetration (SVP), including coerced, physically forced, and alcohol-or drug-facilitated unwanted sex occurs frequently in adolescence, and may represent a risk factor for future perpetration. Sexual violence victimization (SVV) has been found to be a risk factor for increased rates of depression and post-traumatic stress disorder (PTSD), however, the associations of SVP with depression or post-traumatic stress symptoms (PTSS) have been less well described. This study examined associations between symptoms of depression and PTSS with SVP in the prior 12 months among high school students. In this cross-sectional analysis, a representative sample of public high school students (9th-12th grade) completed self-reported surveys on peer SVP and SVV within the past year. Among 16,784 students completing surveys, 7.2% disclosed SVP against another high school student in the past 12 months; 64.4% of students disclosing SVP also experienced SVV. Both SVP and SVV, alone or in combination, were associated with a greater likelihood of symptoms of depression or PTSS. These associations were similar by sex and sexual minority status (e.g., LGBTQ+). These findings highlight the need for continued primary prevention efforts. Additional screening to recognize adolescent SVP can allow both early treatment of depression and PTSD and addressing the individual risks of SVP to reduce subsequent repeated sexual assaults.

Keywords

Adolescents; Mental Health; Sexual Violence; Stress Disorders; Post-Traumatic; Depression; Sexual Assault; Post-Traumatic Stress Disorder; Perpetration

Adolescents experience high rates of sexual violence (CDC, 2012). Up to one in three male adolescents report engaging in “sexually aggressive acts” or sexual coercion (Loh, Gidycz, Lobo, & Luthra, 2005; Maxwell, Robinson, & Post, 2003). Although there are many potential sexual perpetration behaviors, when sexual violence is defined to include coerced, physically forced, and alcohol- or drug-facilitated unwanted sex, between one and twelve percent of adolescents self-report sexual violence perpetration (SVP) against a peer, with more males reporting perpetration than females, although both can perpetrate sexual violence (Borowsky, Hogan, & Ireland, 1997; Reyes & Foshee, 2013; Ybarra & Mitchell, 2013).

Perpetration may begin in adolescence but also presents a risk for future SVP. In studies of male, college-aged young adults, SVP during adolescence increases the risk of perpetration during college (White & Smith, 2004). Younger age at first SVP and increased severity of SVP are associated with increased risk of repeat SVP for males during college (Zinzow & Thompson, 2015). However, not all adolescents will continue to perpetrate, similar to other adolescent-limited delinquent behavior that may contrast with life-course-persistent antisocial behavior (Moffitt, 1993). In one study, nearly sixty percent of men who had perpetrated rape during high school did not perpetrate during college (Swartout et al., 2015).

Consistent with the ecological model, which posits concentric spheres of social and family influence on individual development, the most well-described etiological risks for adolescent SVP include community and relationship factors (Bronfenbrenner, 1979; Teten Tharp et al., 2013). Community factors include peer acceptance of SVP and knowing a perpetrator of sexual violence (Morris, Anderson, & Knox, 2002; Moyano, Monge, & Sierra, 2017). Relationship factors include history of maltreatment, especially childhood sexual abuse, poor parental bonding, and poor social relationships (Seto & Lalumière, 2010; Starzyk & Marshall, 2003). Adolescents who engage in SVP may also engage in other forms of interpersonal violence, like homophobic bullying and dating violence (DeGue et al., 2013; Espelage, Basile, Leemis, Hipp, & Davis, 2018; Ozer, Tschann, Pasch, & Flores, 2004).

In addition to community and relationship factors, individual-level associations with adolescent SVP can provide additional information to inform and guide SV prevention and treatment efforts. While SV victimization (SVV) is an established risk factor for poorer mental health among adolescents, far less is unknown about how SVP may affect mental health (Chen et al., 2010). In a large, population-based sample examining SVP, Borowsky (1997) found worse emotional health and increased “suicide risk” of adolescents who self-reported SVP versus those who did not. In a meta-analysis of studies comparing adolescent sexual offenders (in a juvenile justice population) to other, non-sexual offenders, those who had SVP had greater anxiety and depression (Seto & Lalumière, 2010). Banyard, Cross, & Modecki (2006) examined dating violence in a cross sectional study of 980 adolescents (ages 11-19) and found that depressed mood was associated with sexual and physical dating

violence, consistent with other studies of teen dating violence (Banyard, Cross, & Modecki, 2006; Foshee, McNaughton Reyes, & Ennett, 2010).

Prior adverse childhood experiences, especially childhood sexual abuse, have consistently been described as a risk factor for adolescent violence, including SVP (Duke, Pettingell, McMorris, & Borowsky, 2010). However, few studies have examined post-traumatic stress disorder (PTSD) or sub-syndromal post-traumatic stress symptomatology (PTSS) in adolescents who report SVP. One study of adolescent psychiatric inpatients found that those who reported violence perpetration (including 5 subjects who reported sexual violence perpetration) had higher rates of PTSS symptoms including avoidance, hypervigilance, re-experiencing, and dissociation than those psychiatric inpatients who reported no history of perpetration even with similar rates of childhood sexual abuse (Fehon, Grilo, & Lipschitz, 2005). In a qualitative systematic review of studies of risk and protective factors for SVP in both adolescents and adults, no study specifically included PTSS or PTSD (Teten Tharp et al., 2013).

For this analysis, the research question addressed the associations between symptoms of depression and PTSS with SVP in the prior 12 months among high school students. Adolescents who report SVP were hypothesized to be more likely to report recent symptoms of depression (2 weeks or more within the past year) or PTSS (within the past month) relative to those with no experience of SV. Because SVV is a known risk for depression and PTSS (Chen et al., 2010; McLaughlin et al., 2013; Olshen, McVeigh, Wunsch-Hitzig, & Rickert, 2007) and reports of SVP and SVV frequently co-occur (Banyard et al., 2006), analyses were conducted among those who had experienced both SVP and SVV (SVP&SVV), SVP-only, SVV-only, and no SV in the past 12 months. This large, population-based, cross-sectional sample was powered to explore SVP and SVV separately after controlling for confounders. The contribution of this research to the existing literature is our investigation of the mental health effects of SVP among female and male adolescents and our concurrent measurement of SVP alone and within the context of SVV. Improving our understanding of the association between SVP and depression and PTSS may help to both develop better evaluation techniques and improve referral to appropriate treatments.

Methods

Participants

This cross-sectional analysis used data collected as part of a cluster-randomized control trial evaluating the effectiveness of a bystander intervention to reduce SVP in 26 Kentucky high schools (two schools in each of thirteen geographic regions across the state) from 2010-2014 (U01CE001675). For this analysis only self-administered survey data from students attending the 26 participating high schools and completed between Jan and May 2011 (before the intervention) were used; 21,608 were present on the day of surveying across all schools (Coker, Bush, Brancato, Clear, & Recktenwald, 2018; Coker et al., 2017).

The survey was a 99-item, paper and pencil, anonymous questionnaire that took approximately 25-40 minutes to complete. The survey was conducted using the model

familiar to schools in the Youth Risk Behavior Survey (YRBS) (Brener et al., 2013). Study personnel administered surveys during school hours. Resources were included, such as websites and toll-free numbers for national agencies available at all times to address domestic violence, sexual assault, depression, or suicidal ideation at the end of the survey booklet and on the pencils used to complete the survey.

Consent

All parents and guardians of enrolled students were mailed a letter describing the study at least two weeks prior to surveying. Parents and guardians who did not want their student to complete the survey were asked to call or email the study staff with the name and school of their child. Study staff worked with teachers to identify those students in individual classrooms.

Study staff read elements of the assent form to students who were directed to review the full assent in the survey booklet. Those opting not to complete the survey or those whose parent(s) did not grant permission for participation were asked to quietly remain in their seat. These students received a booklet with the same cover as their peers but no questionnaire was included. Study staff provided the same instructions and assent information to all students; students who did not wish to participate were asked to indicate so on the forms. Study protocol was approved by the Institutional Review Board.

Sexual Violence Perpetration

The questions about sexual violence were prefaced with the following introduction: “The next questions are about sexual activities. Some of the questions might make you uncomfortable. Remember that this survey is anonymous. Your name will not be linked to your answers. You may also skip questions that make you uncomfortable.” Three items were used to measure SVP: 1) “In the last 12 months, how many times have you had sexual activities with a high school student because you either threatened to end your friendship or romantic relationship if they did not or because you pressured the other person by arguing or begging?” 2) “In the last 12 months, how many times have you had sexual activities with a high school student because she/he were drunk or on drugs?” 3) “In the last 12 months how many times have you had sexual activities with another high school student by threatening to use or used physical force (for example, twisting their arm or holding them down)?” Response options for all items ranged from never, 1-2 times, 3-5 times, 6-9 and 10 or more times, and yes, but not in the past 12 months. An indicator variable was created for each item to represent the proportion reporting each tactic occurring one or more times in the past 12 months (all dichotomous yes/no variables).

Sexual Violence Victimization

The same three items were rephrased to determine SVV: 1) “In the last 12 months, how many times have you had sexual activities even though you didn’t really want to because either they threatened to end your friendship or romantic relationship if you didn’t or you felt pressured by the other person’s constant arguments or begging” 2) “In the last 12 months, how many times have you had sexual activities when you didn’t want to because the other person threatened to use or used physical force (like twisting your arm, holding

you down) if you did not agree?” 3) “In the last 12 months, how many times have you had sexual activities when you didn’t want to because you were drunk or on drugs.” The ordinal response options for these items were similar to the SVP questions, and we created dichotomous indicator variables for those who reported they had experienced each tactic one or more times in the past 12 months.

Mutually exclusive categories of SV experience were created as follows: 1) both perpetration and victimization (SVP & SVV), 2) perpetration alone (SVP-only), 3) victimization alone (SVV-only), and 4) the comparison group with no SVP nor SVV (no SV).

Symptoms of Depression and Post Traumatic Stress

The following question, based on past YRBS surveys, was used to define self-reported symptoms of depression: “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.” A yes response was used to define depressive symptoms in the past 12 months.

Symptoms of post-traumatic stress (PTSS) were defined using the following two questions with the introduction: “Have you personally ever had any experience that was so frightening, horrible or upsetting that in the past month you: 1) had nightmares about it [experience described] or thought about it when you did not want to? 2) Tried hard not to think about it or went out of your way to avoid situations that reminded you of it?” Post-traumatic symptoms were defined for this analysis as a yes answer to both of the above two questions.

Demographics and violence risk factors

Several demographic variables were included in the survey. Sex (male or female) and grade in school (9th-12th) were analyzed as asked. Race was asked using the question, “How would you describe yourself?” The response options were: “American Indian or Alaska Native,” “Asian,” “Black or African American,” “Hispanic or Latino/Latina,” “White,” and “Other.” Students were allowed to select only one option. For the analysis, responses were dichotomized to “White” and “Non White.”

Participants were asked about sexual minority status, dating/relationship status, sexual activity status, and witnessing parent-partner violence. Sexual minority status was operationalized with the following item addressing sexual attraction: “People are different in their sexual attraction to other people. Which best describes your feelings?” The response options were: 1) “only attracted to females,” 2), “mostly attracted to females,” 3) “equally attracted to females and males,” 4) “mostly attracted to males,” 5) “only attracted to males,” and 6) “not sure.” Students reporting exclusive heterosexual attraction were coded as such, an indication of sexual majority status. All others were coded as not exclusively attracted to the opposite sex, indicating sexual minority status. We assessed current dating or relationship status with this question: “During the past 12 months, have you been in a relationship with a boyfriend or girlfriend? By a relationship we mean either having a partner for a planned event like a school dance or going to the movies, having a sex partner, or hanging out in a group with a boyfriend or girlfriend.” Response options were collapsed to indicate whether the student had or had not been in a relationship in the past 12 months.

Because sexual violence is highly correlated with sexual activity, students were grouped in to sexually active and not sexually active based on their response to the question, “how old were you when you had sexual intercourse for the first time?” Those responding that they had never had sexual intercourse were coded as not sexually active and all others were coded as sexually active. We measured parent partner violence with the item: “In your family, how often did you see or hear one of your parents or guardians being hit, slapped, punched, shoved, kicked or otherwise physically hurt by their spouse or partner?” Response options were dichotomized as no or yes.

Exclusions

Of the 21,608 students present on the day of the survey, 2,624 refused (12.15%; 11.65% student refusals; 0.5% parental refusals). Incomplete responses were defined as completing less than 30 of 99 items, and incomplete responses were excluded from analyses (n=1857; 8.59%).

Of the remaining 17,126 students, 38 were excluded because they were not in grades 9-12, 17 did not report a sex, and the remaining students were missing data on depression or PTSS (n =235) or current relationship status (n=34). The final analytic sample included 16,784 students.

There were no significant demographic differences between those who agreed and completed the survey and those who did not with the following exception: males were twice as likely ($p<.0001$) as females to refuse to complete the survey.

Statistical Analysis

The frequency of SVP was estimated for all students and by specific items: coerced sex, drug or alcohol facilitated sex, and physically forced sex. SVP was investigated within and across the three items (Table 1) among all students and by sexual attraction (sexual minority and majority status). Demographic and violence risk factors potentially correlated with SVP (with and without SVV) were investigated (see Table 2). Multivariate analyses were used to determine the association between SVP and SVV and symptoms of depression (Table 3) and PTSS (Table 4). Sex (male, female) and sexual attraction were investigated as modifiers for the association between SVP and the two outcomes of depressive symptoms and PTSS in the past 12 months by including an interaction term in multivariable models. Because effect modification was identified analyses were conducted for all students and by sexual attraction.

Comparisons were made using generalize estimating equations, which allow for the relaxation of independence conditions (students attending the same school), adjustment for the study design by condition (intervention v control assignment at the school level) and for the control of potential confounding variables. Two models were used to estimate the association between experiencing SVP with and without co-occurring SVV and symptoms of depression and PTSS in the past 12 months. Models were used to estimate the prevalence rate ratios of having symptoms of depression and PTSS in the past 12 months given SVP and SVV experiences. These models included adjustment for potential confounders and the parent randomized control study design by incorporating the condition as a covariance and

including the sampled high school (n=26) in generalized estimating equations (Coker et al., 2017). All analyses were conducted using Statistical Analysis Software, SAS, version 9.4; SAS Institute; Cary, North Carolina.

Results

One in fourteen (7.2%) high school students reported SVP against another student in the past 12 months (see Table 1). Ten percent (10.0%) of male high school students reported SVP whereas 5.0% of female high school students reported SVP experiences (see Table 2). Alcohol- or drug-facilitated perpetration was the most commonly used SVP tactic (5.8% of all students or 80.6% of all SVP disclosed; Table 1), followed by coerced sex (3.0% or 41.7% of all SVP) with physically forced sex being the least commonly reported (2.2% or 30.6% of all SVP). Looking at the co-occurrence of SVP tactics, 17.5% of those disclosing SVP acknowledged use of all three tactics. Rates of SVP were consistently higher among sexual minority than sexual majority students for all three tactics ($p<.0001$).

The majority of students who disclosed SVP also disclosed SVV: 64.4% among all students, 73.6% among sexual minority students, and 61.3% of sexual majority students. This co-occurrence of SVP and SVV was greatest for physically forced sex (82.0%) followed by coerced sex (74.7%) and lowest (63.8%) for drug- or alcohol-facilitated sex.

Table 2 provides associations between SVP, SVV, and potential confounders. The following factors were associated ($p<.01$, see Table 2) with increased disclosure of any SVP or SVV: male sex, sexual minority status, high school year (11th & 12th), racial minority (not white), being sexually active, in a relationship in the past 12 months, and witnessing parental intimate partner violence. Given these demographic or violence risk factor differences, models were adjusted for the following confounders: sex, race, sexual minority status, being sexually active or not, and being in a relationship in the past 12 months or not. Resulting adjusted prevalence rate ratios (aRR) for sexual violence combinations and symptoms of depression (Table 3) and PTSS (Table 4) were reported for all students, by sex, and by sexual minority status. Witnessing parental intimate partner violence was not included in adjusted models because this variable so strongly correlated with sexual violence and sexual activity that models did not converge.

Among all students, adjusted depressive symptom rates (Tables 3) were highest among students disclosing SVP & SVV (69.8%), intermediate (60.4%) for those with SVV-only, 44.4% among those with SVP-only, and lowest for students with no SV exposure (33.9%). Similar patterns were observed by sexual minority status, yet the rates of depression were consistently higher among sexual minority students.

After adjusting for additional demographic, relationship, and sexual activity confounders, students with SVP & SVV had a 56% increased rate of depressive symptoms (aRR = 1.56; 95% CI: 1.44-1.68) as did those who reported SVV-only (aRR = 1.59; 95% CI: 1.50-1.68). While the rate ratios were lower for SVP-only and depressive symptoms (aRR = 1.20; 95% CI 1.07-1.35), this association was statistically significant. Similar patterns were observed by sex and sexual minority with the important difference that rate ratios were greater among

sexual majority students. Among sexual minority students, SVP-only was not associated with depressive symptoms among males and females. Note that statistical power was limited as <100 students were in this stratum.

Findings for SVP, SVV, and PTSS were similar to those for depressive symptoms. Among all students, adjusted PTSS rates (Table 4) were highest among students disclosing both SVP & SVV (40.4%) and SVV-only (42.4%), intermediate for those disclosing SVP-only (27.8%) and lowest for students with no SV exposure (19.3%). Similar patterns were observed by sexual minority status, yet the rates of PTSS were consistently higher among sexual minority than majority students.

After adjusting for confounders, students with SVP&SVV had a two-fold increased rate of PTSS (aRR = 1.96; 95% CI 1.77-2.16) as did those experiencing SVV-only (aRR = 2.04; 95% CI = 1.90-2.20). SVP-only was associated with a 36% increased rate of PTSS (aRR = 1.36, 95% CI 1.15-1.61). In short, while both SVP and SVV were associated with an increased rate of PTSS; SVV was more strongly associated with PTSS than SVP. Similar patterns were observed by sexual minority status, yet the impact of SV on PTSS was greater among sexual majority students. The effect of SVP and SVV on PTSS was similar among females and males.

Discussion

In this large, representative sample of adolescents, SVP (alone and in combination with SVV) in the past 12 months was associated with recent symptoms of depression and PTSS. The pattern held among both males and females and those within sexual majority and minority status. SVV-only has previously been demonstrated to have associations with depression and PTSS, a finding which was reaffirmed in our current sample, adding SVV-only was associated with a greater relative risk of depression and PTSS symptoms than SVP-only.

Implications for Mental Health Assessment, Sexual Violence Prevention, and Interventions

Although current evaluation protocols for pediatric health professionals who examine patients with concerns for PTSD or depression recommend asking about a child or adolescent's history of SVV, but omit questions about SVP (Cohen, 2010; King & AACAP Work Group on Quality Issues, 1997). Most trauma history screeners include sexual victimization experiences and few, if any, dimensionalize sexual violence experiences to include perpetration, even though this behavior is well recognized as a response to maltreatment in childhood (Glasser et al., 2001; Seto, Babchishin, Pullman, & McPhail, 2015). For instance, the American Academy of Pediatrics (AAP) provides guidance to health care professionals regarding screening and assessment of sexualized behavior, and victimization in youth (Kellogg, 2009). The clinical report on the evaluation of sexual behavior suggests that developmental considerations, types and frequency of sexualized behavior, parental response to the behavior, situational factors, access to sexually explicit material, home environment and history of abuse or neglect are important domains of interest that influence sexual behaviors and perceptions of healthy sexual boundaries. Including perpetration experiences into a comprehensive assessment of sexual and mental

health, including child traumatic stress symptoms facilitates the process of differential therapeutics, and the tailoring of interventions to meet the needs of a diverse population of adolescents.

Current SVP prevention initiatives (e.g. creating safe environments, social-emotional learning, teaching health and safe dating skills, promoting healthy sexuality, empowerment based training) target the social ecology of sexual violence, including the community and relationship factors that influence individual behavior, in order to reduce the rates of SVP (Basile et al., 2016; DeGue et al., 2014). Implementing changes in protocols for community and school reporting and responding to sexual violence, such as advocated by Shifting Boundaries, can reduce both sexual harassment and peer sexual violence (Taylor, Stein, Mumford, & Woods, 2013). Psychoeducation establishes the physical and psychological foundations for healthy intimacy by communicating to youth their rights and responsibilities for their own bodies and behaviors in order to facilitate safety in close relationships with others (Roberts, Rosario, Corliss, Koenen, & Austin, 2012). Teaching about healthy relationships and intimacy in programs such as Safe Dates can build skills needed to resolve conflicts and decrease attitudes that contribute to peer and sexual violence (Foshee et al., 1998; Foshee et al., 2000). Bystander interventions, such as Green Dot or Coaching Boys into Men, and other socio-environmental approaches can interrupt the pathways to and between victimization and perpetration (Coker et al., 2017; Miller et al., 2012; Wolfe et al., 2009). Including additional information about emotional health in prevention protocols, such as psychoeducation about depression and PTSD, may strengthen the ability to reach potentially vulnerable adolescents.

Further work is needed to ensure access to effective individual treatments for those adolescents perpetrating sexual violence (Borduin, Henggeler, Blaske, & Stein, 1990). Because trauma symptoms may be present in those with both victimization and perpetration experiences, evidence-based trauma interventions could address both PTSD and alterations in mood presenting as depressive symptoms. Recognizing, responding to, and intervening to address SVP can allow both early treatment of depression and PTSD and addressing the individual risks of SVP to reduce subsequent repeated sexual assaults.

Sexual Minority Youth

Another unique contribution of this paper was our examination of SVP and both mental health outcomes within sexual minority and majority groups. Prior studies have found SVV rates to be higher among adolescents of sexual minority (e.g., LGBTQ+) compared with adolescent of sexual majority (i.e., exclusively heterosexual) (Halpern, Young, Waller, Martin, & Kupper, 2004; Martin-Storey & Fromme, 2016; Pathela & Schillinger, 2010). In this study, sexual minority youth reported higher rates of SVP and SVV than sexual majority youth, yet the association between SV and both mental health outcomes was attenuated compared to that among sexual majority students.

Rates of depression were higher for sexual minority youth, even among those who had not experienced SV (43.3%), compared with sexual majority youth. Although the rates were high, they are consistent with prior studies that have found high rates of depression and suicidality among sexual minority youth. Recent studies, for example, found 40% of

sexual minority adolescents had contemplated suicide within the past year (Caputi, Smith, & Ayers, 2017; Remafedi, French, Story, Resnick, & Blum, 1998). Trauma symptoms in sexual minority youth who were not exposed to sexual violence within the past year were also higher than non-exposed sexual majority youth, which could represent other pathways to post-traumatic symptoms, such as peer victimization, family violence, or child maltreatment (Friedman et al., 2011; Ybarra, Mitchell, Palmer, & Reisner, 2015).

Adolescents who identify as sexual minorities may need additional support, given the higher rates of trauma and depression symptom expression noted in this study compared with sexual majority students. Sexual minorities seek treatment at higher rates than their counterparts, suggesting opportunities for screening and intervention (Grella, Cochran, Greenwell, & Mays, 2011). Future research is needed to further elucidate the interactions between SVP and SVV in sexual minorities in particular, so that existing prevention and treatment approaches can be tailored to capture teachable moments that influence sexual behavior. Given that primary and secondary prevention strategies have shown promise to reduce SVP, additional research is needed to develop and test programming specifically including sexual minority adolescents (DeGue et al., 2014; Miller et al., 2013).

Limitations

As with all studies, the present study had limitations of note. Adolescent self-reports may be limited by recall of experiences or emotions. Sampling was limited to adolescents who are within the regular school environment; there may be differences in those who are not in traditional educational settings. Because our questionnaires used descriptive wording familiar to most high school students, some of the questions could have been understood differently by different students. For instance, because we were focused on peer perpetration experiences, our questions asked about perpetration specifically against another high school student, but could have been interpreted to exclude perpetration against those peers who were not enrolled in a school environment and other perpetration experiences. Youth trauma responses could have fallen outside those symptoms tapped by the trauma history screener used, if so posttraumatic stress responses may be underestimated. As this is a cross-sectional design, the associations do not establish a causal relationship between sexual violence and emotional distress (depression or post-traumatic symptoms) and may reflect pre-existing mental health concerns that place adolescents at risk for sexual violence and/or sexual violence associated with increased risk of mental health issues. However, given the dearth of information on SVP and mental health in the literature and the need to improve both screening and interventions, our study fills a gap that may have important implications for adolescent mental health. Finally, while the diversity of our sample was reflective of the surrounding community, only 17.7% of our sample identified as non-white and 13.9% as sexual minority. Given our sample's limited diversity, we did not have sufficient power for subgroup analyses investigating associations between SVP and either mental health outcome.

Conclusions

Approaches to addressing sexual violence over the lifespan that are developmentally nuanced to consider how SVP interacts with adolescent mental health could transform the current approach to evaluation, treatment, and prevention. Future research is needed to understand the temporal sequence of these associations. SVV and SVP are correlated with an increased risk of depression and PTSS but could be either a precursor or a result of sexual violence. Understanding the sequence of SV with mental health could add to our current understanding of the etiological factors that contribute to development of perpetration behaviors and lead to more effective interventions.

Acknowledgments:

Research was supported by the Centers for Disease Control and Prevention Cooperative Agreement U01CE001675 and National Institute of Health/National Institute of Child Health and Development (R01HD075783). The Centers for Disease Control and Prevention had a supervisory role in the design and conduct of the study but had no direct role in the collection, management, analysis, or interpretation of the data; the preparation, review, or approval of the manuscript; or the decision to submit the manuscript for publications. Trial Registration: [ClinicalTrials.gov Identifier: NCT01878097](https://clinicaltrials.gov/Identifier/NCT01878097). <https://clinicaltrials.gov/show/NCT01878097>.

Conflict of Interest/Disclosure:

Dr. Meadows reports research funding from Kentucky Children's Hospital-Children's Miracle Network. Dr. Coker reports research funding from the Centers for Disease Control and Prevention and the National Institute of Health. Dr. Bush, Ms. Clear, Dr. Sprang, and Ms. Brancato report no biomedical financial interests or potential conflicts of interest.

References

- Banyard VL, Cross C, & Modecki KL (2006). Interpersonal violence in adolescence: Ecological correlates of self-reported perpetration. *Journal of interpersonal violence*, 21(10), 1314–1332. [PubMed: 16940398]
- Basile KC, DeGue S, Jones K, Freire K, Dills J, Smith SG, & Raiford JL (2016). STOP SV: A Technical Package to Prevent Sexual Violence. Atlanta, Georgia: Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention
- Borduin CM, Henggeler SW, Blaske DM, & Stein RJ (1990). Multisystemic treatment of adolescent sexual offenders. *International journal of offender therapy and comparative criminology*, 34(2), 105–113.
- Borowsky IW, Hogan M, & Ireland M (1997). Adolescent sexual aggression: risk and protective factors. *Pediatrics*, 100(6), e7–e7.
- Brener ND, Kann L, Shanklin S, Kinchen S, Eaton DK, Hawkins J, & Flint KH (2013). Methodology of the youth risk behavior surveillance system—2013. *Morbidity and Mortality Weekly Report: Recommendations and Reports*, 62(1), 1–20.
- Bronfenbrenner U (1979). *The ecology of human development*: Harvard university press.
- Caputi TL, Smith D, & Ayers JW (2017). Suicide risk behaviors among sexual minority adolescents in the united states, 2015. *Jama*, 318(23), 2349–2351. Retrieved from 10.1001/jama.2017.16908. doi:10.1001/jama.2017.16908 [PubMed: 29260214]
- CDC (Producer). (2012, December 15, 2017). Sexual Violence in Youth. Retrieved from <https://www.cdc.gov/violenceprevention/pdf/2012findingsonsvinyouth.pdf>
- Chen LP, Murad MH, Paras ML, Colbenson KM, Sattler AL, Goranson EN, ... Prokop LJ (2010). Sexual abuse and lifetime diagnosis of psychiatric disorders: systematic review and meta-analysis. *Mayo Clinic Proceedings*, 85(7), 618–629. [PubMed: 20458101]
- Cohen JA (2010). Practice Parameter for the Assessment and Treatment of Children and Adolescents With Posttraumatic Stress Disorder. *Journal of the American Academy of Child*

- & Adolescent Psychiatry, 49(4), 414–430. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0890856710000821>. doi:10.1016/j.jaac.2009.12.020 [PubMed: 20410735]
- Coker AL, Bush HM, Brancato CJ, Clear ER, & Recktenwald EA (2018). Bystander Program Effectiveness to Reduce Violence Acceptance: RCT in High Schools. *Journal of Family Violence*, 1–12. [PubMed: 30828128]
- Coker AL, Bush HM, Cook-Craig PG, DeGue SA, Clear ER, Brancato CJ, ... Recktenwald EA (2017). RCT testing bystander effectiveness to reduce violence. *American journal of preventive medicine*, 52(5), 566–578. [PubMed: 28279546]
- DeGue S, Massetti GM, Holt MK, Tharp AT, Valle LA, Matjasko JL, & Lippy C (2013). Identifying links between sexual violence and youth violence perpetration: New opportunities for sexual violence prevention. *Psychology of violence*, 3(2), 140. [PubMed: 29644117]
- DeGue S, Valle LA, Holt MK, Massetti GM, Matjasko JL, & Tharp AT (2014). A systematic review of primary prevention strategies for sexual violence perpetration. *Aggression and violent behavior*, 19(4), 346–362. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1359178914000536>. doi:10.1016/j.avb.2014.05.004 [PubMed: 29606897]
- Duke NN, Pettingell SL, McMorris BJ, & Borowsky IW (2010). Adolescent violence perpetration: associations with multiple types of adverse childhood experiences. *Pediatrics*, peds. 2009–0597.
- Espelage DL, Basile KC, Leemis RW, Hipp TN, & Davis JP (2018). Longitudinal examination of the bullying-sexual violence pathway across early to late adolescence: implicating homophobic name-calling. *Journal of youth and adolescence*, 1–14. [PubMed: 29030792]
- Fehon DC, Grilo CM, & Lipschitz DS (2005). A comparison of adolescent inpatients with and without a history of violence perpetration: Impulsivity, PTSD, and violence risk. *The Journal of nervous and mental disease*, 193(6), 405–411. [PubMed: 15920381]
- Foshee VA, Bauman KE, Arriaga XB, Helms RW, Koch GG, & Linder GF (1998). An evaluation of Safe Dates, an adolescent dating violence prevention program. *American journal of public health*, 88(1), 45–50. Retrieved from 10.2105/AJPH.88.1.45. doi:10.2105/AJPH.88.1.45 [PubMed: 9584032]
- Foshee VA, Bauman KE, Greene WF, Koch GG, Linder GF, & MacDougall JE (2000). The Safe Dates program: 1-year follow-up results. *American journal of public health*, 90(10), 1619. [PubMed: 11029999]
- Foshee VA, McNaughton Reyes HL, & Ennett ST (2010). Examination of sex and race differences in longitudinal predictors of the initiation of adolescent dating violence perpetration. *Journal of Aggression, Maltreatment & Trauma*, 19(5), 492–516.
- Friedman MS, Marshal MP, Guadamuz TE, Wei C, Wong CF, Saewyc EM, & Stall R (2011). A meta-analysis of disparities in childhood sexual abuse, parental physical abuse, and peer victimization among sexual minority and sexual nonminority individuals. *American journal of public health*, 101(8), 1481–1494. [PubMed: 21680921]
- Glasser M, Kolvin I, Campbell D, Glasser A, Leitch I, & Farrelly S (2001). Cycle of child sexual abuse: Links between being a victim and becoming a perpetrator. *The British Journal of Psychiatry*, 179(6), 482–494. [PubMed: 11731348]
- Grella CE, Cochran SD, Greenwell L, & Mays VM (2011). Effects of sexual orientation and gender on perceived need for treatment by persons with and without mental disorders. *Psychiatric services*, 62(4), 404–410. [PubMed: 21459992]
- Halpern CT, Young ML, Waller MW, Martin SL, & Kupper LL (2004). Prevalence of partner violence in same-sex romantic and sexual relationships in a national sample of adolescents. *Journal of adolescent health*, 35(2), 124–131.
- Kellogg ND (2009). Clinical report—the evaluation of sexual behaviors in children. *Pediatrics*, 124(3), 992–998. [PubMed: 19720674]
- King RA, & AACAP Work Group on Quality Issues. (1997). Practice parameters for the psychiatric assessment of children and adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(10), 4S–20S. [PubMed: 9606102]
- Loh C, Gidycz CA, Lobo TR, & Luthra R (2005). A prospective analysis of sexual assault perpetration: Risk factors related to perpetrator characteristics. *Journal of interpersonal violence*, 20(10), 1325–1348. [PubMed: 16162492]

- Martin-Storey A, & Fromme K (2016). Trajectories of dating violence: differences by sexual minority status and gender. *Journal of adolescence*, 49, 28–37. [PubMed: 26994347]
- Maxwell CD, Robinson AL, & Post LA (2003). The nature and predictors of sexual victimization and offending among adolescents. *Journal of youth and adolescence*, 32(6), 465–477.
- McLaughlin KA, Koenen KC, Hill ED, Petukhova M, Sampson NA, Zaslavsky AM, & Kessler RC (2013). Trauma Exposure and Posttraumatic Stress Disorder in a National Sample of Adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, 52(8), 815–830.e814. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0890856713003389>. doi:10.1016/j.jaac.2013.05.011 [PubMed: 23880492]
- Miller E, Tancredi DJ, McCauley HL, Decker MR, Virata MCD, Anderson HA, ... Silverman JG (2013). One-year follow-up of a coach-delivered dating violence prevention program: A cluster randomized controlled trial. *American journal of preventive medicine*, 45(1), 108–112. [PubMed: 23790995]
- Miller E, Tancredi DJ, McCauley HL, Decker MR, Virata MCD, Anderson HA, ... Silverman JG (2012). “Coaching boys into men”: A cluster-randomized controlled trial of a dating violence prevention program. *Journal of adolescent health*, 51(5), 431–438.
- Moffitt TE (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100(4), 674–701. [PubMed: 8255953]
- Morris RE, Anderson MM, & Knox GW (2002). Incarcerated adolescents’ experiences as perpetrators of sexual assault. *Archives of pediatrics & adolescent medicine*, 156(8), 831–835. [PubMed: 12144376]
- Moyano N, Monge FS, & Sierra JC (2017). Predictors of sexual aggression in adolescents: Gender dominance vs. rape supportive attitudes. *The European Journal of Psychology Applied to Legal Context*, 9(1), 25–31. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1889186116300312>. doi:10.1016/j.ejpal.2016.06.001
- Olshen E, McVeigh KH, Wunsch-Hitzig RA, & Rickert VI (2007). Dating violence, sexual assault, and suicide attempts among urban teenagers. *Archives of pediatrics & adolescent medicine*, 161(6), 539–545. Retrieved from 10.1001/archpedi.161.6.539. doi:10.1001/archpedi.161.6.539 [PubMed: 17548757]
- Ozer EJ, Tschann JM, Pasch LA, & Flores E (2004). Violence perpetration across peer and partner relationships: Co-occurrence and longitudinal patterns among adolescents. *Journal of adolescent health*, 34(1), 64–71.
- Pathela P, & Schillinger JA (2010). Sexual behaviors and sexual violence: adolescents with opposite-, same-, or both-sex partners. *Pediatrics*, 126(5), 879–886. [PubMed: 20974791]
- Remafedi G, French S, Story M, Resnick MD, & Blum R (1998). The relationship between suicide risk and sexual orientation: results of a population-based study. *American journal of public health*, 88(1), 57–60. [PubMed: 9584034]
- Reyes HLM, & Foshee VA (2013). Sexual dating aggression across grades 8 through 12: Timing and predictors of onset. *Journal of youth and adolescence*, 42(4), 581–595. [PubMed: 23180071]
- Roberts AL, Rosario M, Corliss HL, Koenen KC, & Austin SB (2012). Elevated risk of posttraumatic stress in sexual minority youths: mediation by childhood abuse and gender nonconformity. *American journal of public health*, 102(8), 1587–1593. [PubMed: 22698034]
- Seto MC, Babchishin KM, Pullman LE, & McPhail IV (2015). The puzzle of intrafamilial child sexual abuse: A meta-analysis comparing intrafamilial and extrafamilial offenders with child victims. *Clinical psychology review*, 39, 42–57. [PubMed: 25935749]
- Seto MC, & Lalumière ML (2010). What is so special about male adolescent sexual offending? A review and test of explanations through meta-analysis. *Psychological bulletin*, 136(4), 526. [PubMed: 20565168]
- Starzyk KB, & Marshall WL (2003). Childhood family and personological risk factors for sexual offending. *Aggression and violent behavior*, 8(1), 93–105.
- Swartout KM, Koss MP, White JW, Thompson MP, Abbey A, & Bellis AL (2015). Trajectory analysis of the campus serial rapist assumption. *JAMA pediatrics*, 169(12), 1148–1154. [PubMed: 26168230]

- Taylor BG, Stein ND, Mumford EA, & Woods D (2013). Shifting Boundaries: An Experimental Evaluation of a Dating Violence Prevention Program in Middle Schools. *Prevention Science*, 14(1), 64–76. Retrieved from 10.1007/s11121-012-0293-2. doi:10.1007/s11121-012-0293-2 [PubMed: 23076726]
- Teten Tharp A, DeGue S, Valle LA, Brookmeyer KA, Massetti GM, & Matjasko JL (2013). A systematic qualitative review of risk and protective factors for sexual violence perpetration. *Trauma, Violence, & Abuse*, 14(2), 133–167.
- White JW, & Smith PH (2004). Sexual assault perpetration and reperpetration: From adolescence to young adulthood. *Criminal Justice and Behavior*, 31(2), 182–202.
- Wolfe DA, Crooks C, Jaffe P, Chiodo D, Hughes R, Ellis W, ... Donner A (2009). A school-based program to prevent adolescent dating violence: A cluster randomized trial. *Archives of pediatrics & adolescent medicine*, 163(8), 692–699. [PubMed: 19652099]
- Ybarra ML, & Mitchell KJ (2013). Prevalence rates of male and female sexual violence perpetrators in a national sample of adolescents. *JAMA pediatrics*, 167(12), 1125–1134. Retrieved from 10.1001/jamapediatrics.2013.2629. doi:10.1001/jamapediatrics.2013.2629 [PubMed: 24100409]
- Ybarra ML, Mitchell KJ, Palmer NA, & Reisner SL (2015). Online social support as a buffer against online and offline peer and sexual victimization among US LGBT and non-LGBT youth. *Child abuse & neglect*, 39, 123–136. [PubMed: 25192961]
- Zinzow HM, & Thompson M (2015). A longitudinal study of risk factors for repeated sexual coercion and assault in US college men. *Archives of sexual behavior*, 44(1), 213–222. [PubMed: 24567167]

Table 1.

Frequency of Sexual Violence Perpetration among all students and among those using Sexual Violence by specific tactic (coercion, alcohol or drug facilitated, and physically forced sex)

Sexual Violence Perpetration (SVP)	N in stratum (%)		# (%), Sexual Minority by sex n=2,326		# (%), Sexual Majority by sex n=14,458	
	All, N=16,784		Male n=694	Female n=1,632	Male n=6,766	Female n=7,692
No SVP	15,598	(92.9)	581 (83.7)	1,451 (88.9)	6,149 (90.9)	7,417 (96.4)
Any of three tactics	1,186	(7.1)	113 (16.3)	181 (11.1)	617 (9.1)	275 (3.6)
% by Tactic						
-Coerced sex	497	(3.0)	65 (9.4)	67 (4.1)	267 (4.0)	98 (1.3)
- Alcohol or Drug facilitated	944	(5.6)	93 (13.4)	146 (9.0)	488 (7.2)	217 (2.8)
-Physically forced sex	365	(2.2)	60 (8.7)	48 (2.9)	200 (3.0)	57 (0.7)
Co-occurring tactics						
- Coerced only	139	(0.8)	8 (1.2)	24 (1.5)	66 (1.0)	37 (0.5)
- Alcohol/drug only	608	(3.6)	34 (4.9)	103 (6.3)	294 (4.4)	164 (2.1)
- Physically forced only	43	(0.3)	8 (1.2)	4 (0.3)	24 (0.4)	5 (0.1)
-Alcohol/drug <u>and</u> coerced	93	(0.6)	11 (1.6)	6 (0.4)	57 (0.8)	17 (0.2)
-Physically forced <u>and</u> coerced	65	(0.4)	6 (0.9)	7 (0.4)	39 (0.6)	16 (0.2)
-Physically forced <u>and</u> alcohol/drug facilitated	52	(0.3)	4 (0.6)	7 (0.4)	32 (0.5)	8 (0.1)
-All three SVP tactics	212	(1.3)	42 (6.1)	30 (1.8)	105 (1.6)	28 (0.4)

- Coerced sex (perpetration): In the last 12 months, how many times have you had sexual activities with a high school student because you either threatened to end your friendship or romantic relationship if they did not or because you pressured the other person by arguing or begging?

- Drug or alcohol facilitated sex (perpetration): In the last 12 months, how many times have you had sexual activities with a high school student because she/he were drunk or on drugs?

- Physically forced sex (perpetration): In the last 12 months how many times have you had sexual activities with another high school student by threatening to sue or used physical force (for example, twisting their arm or holding them down)?

Table 2.

Demographic and violence risk factors by Sexual Violence Perpetration and Victimization combinations

		Number (%)				
	N in stratum	SVP & SVV	SVP-only	SVV-only	No SV	Chi-square_{df} p
All Students	16,784	780 (4.7%)	432 (2.6%)	2080 (12.4%)	13492 (80.4%)	
Sex						
Males	7,460	448 (6.0%)	298 (4.0%)	462 (6.2%)	6252 (83.8%)	594.62 ₁ p<.0001
Females	9,324	332 (3.6%)	134 (1.4%)	1618 (17.4%)	7240 (77.7%)	
Sexual Minority Status						
Minority	2,326	220 (9.5%)	79 (3.4%)	455 (19.6%)	1572 (67.6%)	308.58 ₁ p<.0001
Majority	14,458	560 (3.9%)	353 (2.4%)	1625 (11.2%)	11920 (82.5%)	
Year in School						
9 th grade	4,741	196 (4.1%)	110 (2.3%)	524 (11.1%)	3911 (82.5%)	37.04 ₉ p<.0001
10 th grade	4,667	241 (5.2%)	109 (2.3%)	549 (11.8%)	3768 (80.7%)	
11 th grade	4127	201 (4.9%)	130 (3.2%)	566 (13.7%)	3230 (78.3%)	
12 th grade	3249	142 (4.4%)	83 (2.6%)	441 (13.6%)	2583 (79.5 %)	
Race						
Non White	2972	243 (8.2%)	83 (2.8%)	357 (12.0%)	2289 (77.0%)	102.97 ₁ p<.0001
White	13812	537 (3.9%)	349 (2.5%)	1723 (12.5%)	11203 (81.1%)	
Sexually Active						
Yes	8309	679 (8.2%)	358 (4.3%)	1651 (19.9%)	5621 (67.7%)	1707.38 ₁ p<.0001
No	8446	101 (1.2%)	74 (0.9%)	424 (5.0%)	7847 (92.9%)	
In a relationship, past 12 months						
Yes	13318	705 (5.3%)	392 (2.9%)	1980 (14.9%)	10241 (76.9%)	508.48 ₁ p<.0001
No	3466	75 (2.20%)	40 (1.2%)	100 (2.9%)	3251 (93.8%)	
Witnessed parental partner violence						
Yes	3536	336 (9.5%)	115 (3.3%)	705 (19.9%)	2380 (67.3%)	536.70 ₁ p<.0001
No	13229	442 (3.3%)	317 (2.4%)	1374 (10.4%)	11096 (83.9%)	

Table 3.

Rates of Depressive Symptoms in the past 12 months and Sexual Violence Perpetration and Victimization aRR (95% CI) by sex (female and male) and Sexual minority status

		Depressive symptoms (n, % SE)		Adjusted Prevalence Rate Ratio (95% Confidence Interval) ¹		
		n = 5,766	% (SE)	All Students	Among Females ²	Among Males ³
All Students	N=16,784	n= 5,766				
SVP&SVV	780	451	69.8% (0.025)	1.56 (1.44-1.68)	1.58 (1.46-1.73)	1.53 (1.33-1.76)
SVP-only	175	175	44.4% (0.023)	1.20 (1.07-1.35)	1.29 (1.08-1.54)	1.14 (0.88-1.49)
SVV-only	2080	1245	60.4% (0.013)	1.59 (1.50-1.68)	1.60 (1.51-1.70)	1.54 (1.35-1.76)
No SV	13492	3895	33.9% (0.007)	1.00 REF	1.00 REF	1.00 REF
Sexual minority	N=2326	n=1,235				
SVP&SVV	220	145	63.2% (0.039)	1.31 (1.16-1.48)	1.29 (1.14-1.45)	1.33 (1.04-1.69)
SVP-only	79	40	48.6% (0.049)	1.08 (0.88-1.32)	1.08 (0.89-1.31)	1.06 (0.66-1.72)
SVV-only	455	340	70.0% (0.018)	1.44 (1.31-1.58)	1.47 (1.33-1.62)	1.36 (1.13-1.65)
No SV	1572	710	43.3% (0.016)	1.00 REF	1.00 REF	1.00 REF
Sexual majority	N=14458	n=4,531				
SVP&SVV	560	306	56.6% (0.022)	1.85 (1.70-2.02)	1.95 (1.75-2.18)	1.76 (1.57-1.98)
SVP-only	353	135	40.7% (0.026)	1.34 (1.18-1.53)	1.54 (1.16-2.05)	1.23 (1.07-1.41)
SVV-only	1625	905	52.5% (0.013)	1.75 (1.68-1.82)	1.74 (1.64-1.85)	1.74 (1.49-2.02)
No SV	11920	3185	26.6% (0.005)	1.00 REF	1.00 REF	1.00 REF

SVP&SVV = Sexual Violence Victimization and Perpetration; SVV = Sexual Violence Victimization; SVP = Sexual Violence Perpetration

¹ Adjusting for condition ($X^2 = 0.56$ 1 p=NS), sex ($X^2 = 16.30$ 1 p<.0001), svp-svv 4 level combination ($X^2 = 21.38$ 3 p<.0001), not exclusively attracted to the opposite sex: yes v no ($X^2 = 11.60$ 1 p<.0001), nexhet*svp-svv ($X^2 = 12.29$ 3 p=.006), sexually active: yes v no ($X^2 = 15.5$ 1 p<.0001), grade: 9th, 10th, 11th, 12th ($X^2 = 19.88$ 3 p=.0002), in a relationship in last 12 months: yes v no ($X^2 = 17.14$ 1 p<.0001), Race: not white v white ($X^2 = 6.61$ 1 p=.01)

² AMONG Females Adjusting for condition ($X^2 = 0.75$ 1 p=NS), svp-svv 4 level combination ($X^2 = 21.68$ 3 p<.0001), not exclusively attracted to the opposite sex: yes v no ($X^2 = 7.67$ 1 p=.006), nexhet*svp-svv ($X^2 = 12.95$ 3 p=.005), sexually active: yes v no ($X^2 = 10.30$ 1 p=.001), grade: 9th, 10th, 11th, 12th ($X^2 = 19.92$ 3 p=.0002), in a relationship in last 12 months: yes v no ($X^2 = 16.49$ 1 p<.0001), Race: not white v white ($X^2 = 1.57$ 1 p=NS)

³ AMONG Males Adjusting for condition ($X^2 = 0.22$ 1 p=NS), svp-svv 4 level combination ($X^2 = 16.60$ 3 p=.0009), not exclusively attracted to the opposite sex: yes v no ($X^2 = 6.42$ 1 p=.01), nexhet*svp-svv ($X^2 = 5.77$ 3 p=.12), sexually active: yes v no ($X^2 = 14.39$ 1 p=.0001), grade: 9th, 10th, 11th, 12th ($X^2 = 4.72$ 3 p=.19), in a relationship in last 12 months: yes v no ($X^2 = 5.15$ 1 p=.02), Race: not white v white ($X^2 = 9.80$ 1 p=.002)

Rates of ≥ 2 Post-Traumatic Symptoms (PTSS) in the past 12 months and Sexual Violence Perpetration and Victimization by Sex and Sexual minority status

Table 4.

	All Students N=16,784	n= 5,766	PTSS (n, % SE)	Adjusted Prevalence Rate Ratio (95% Confidence Interval) ¹		
				All Students % (SE)	Among Females ²	Among Males ³
SVP&SVV	780	298		40.4% (0.016)	1.96 (1.77-2.16)	2.10 (1.89-2.34)
SVP-only	175	14		27.8% (0.025)	1.36 (1.15-1.61)	1.41 (1.00-1.99)
SVV-only	2080	906		42.4% (0.012)	2.04 (1.90-2.20)	2.08 (1.94-2.25)
No SV	13492	2296		19.3% (0.006)	1.00 REF	1.00 REF
Sexual minority	N=2326	n=798				
SVP&SVV	220	102		44.2% (0.030)	1.75 (1.48-2.06)	1.82 (1.56-2.14)
SVP-only	79	28		33.0% (0.047)	1.33 (1.02-1.75)	1.31 (0.85-2.02)
SVV-only	455	257		49.8% (0.019)	1.93 (1.73-2.16)	1.98 (1.78-2.20)
No SV	1572	411		24.1% (0.012)	1.00 REF	1.00 REF
Sexual majority	N=14458	n=2806				
SVP&SVV	560	196		36.9% (0.019)	2.20 (1.96-2.46)	2.43 (2.08-2.83)
SVP-only	353	76		23.5% (0.024)	1.39 (1.14-1.71)	1.52 (1.03-2.25)
SVV-only	1625	649		36.2% (0.012)	2.16 (1.99-2.34)	2.20 (2.02-2.39)
No SV	11920	1885		15.6% (0.003)	1.00 REF	1.00 REF

¹ Adjusting for condition ($X^2 = 1.27$ 1 $p=NS$), sex ($X^2 = 18.30$ 1 $p<.0001$), svp-svv 4 level combination ($X^2 = 22.30$ 3 $p<.0001$), not exclusively attracted to the opposite sex: yes v no ($X^2 = 11.08$ 1 $p<.0001$), nexhet*svp-svv ($X^2 = 4.18$ 3 $p=.24$), sexually active: yes v no ($X^2 = 5.57$ 1 $p=.02$), grade: 9th, 10th, 11th, 12th ($X^2 = 12.43$ 3 $p=.006$), in a relationship in last 12 months: yes v no ($X^2 = 13.96$ 1 $p<.0001$), Race: not white v white ($X^2 = .46$ 1 $p=NS$)

² AMONG Females Adjusting for condition ($X^2 = 1.09$ 1 $p=NS$), svp-svv 4 level combination ($X^2 = 21.85$ 3 $p<.0001$), not exclusively attracted to the opposite sex: yes v no ($X^2 = 6.25$ 1 $p=.01$), nexhet*svp-svv ($X^2 = 6.36$ 3 $p=.10$), sexually active: yes v no ($X^2 = 2.91$ 1 $p=.09$), grade: 9th, 10th, 11th, 12th ($X^2 = 13.79$ 3 $p=.003$), in a relationship in last 12 months: yes v no ($X^2 = 12.68$ 1 $p=.0004$), Race: not white v white ($X^2 = 0.05$ 1 $p=NS$)

³ AMONG Males Adjusting for condition ($X^2 = 0.10$ 1 $p=NS$), svp-svv 4 level combination ($X^2 = 17.93$ 3 $p=.0005$), not exclusively attracted to the opposite sex: yes v no ($X^2 = 9.39$ 1 $p=.002$), nexhet*svp-svv ($X^2 = 3.34$ 3 $p=.34$), sexually active: yes v no ($X^2 = 3.90$ 1 $p=.05$), grade: 9th, 10th, 11th, 12th ($X^2 = 3.12$ 3 $p=NS$), in a relationship in last 12 months: yes v no ($X^2 = 6.46$ 1 $p=.01$), Race: not white v white ($X^2 = 0.58$ 1 $p=NS$)