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ORIGINAL ARTICLE

Binge Drinking and Depression Symptoms as Risk Factors for Teen Dating Violence Among Sexual Minority Youth

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Abstract

Purpose Given sexual minority youth (SMY) are disproportionately impacted by teen dating violence (TDV), this study assessed binge drinking and depression symptoms as possible risk factors contributing to this disparity.

Methods Cross-sectional survey data collected from a nationally representative sample of SMY high school students in the United States in 2017 and 2019 through the national Youth Risk Behavior Surveillance System (YRBSS) (n = 3,424) was used to create 3 logistic regression models. The models estimated the associations between the exposures, binge drinking and depression symptoms, and TDV, including physical TDV, sexual TDV, or both. Additionally, we hypothesized that these associations would be stronger in SMY than heterosexual youth. Therefore, we expanded the study population to include SMY and heterosexual youth (n = 22,798) and tested for interaction.

Results Both binge drinking (adjusted odds ratio [aOR]: 2.6, 95% confidence interval [CI]: 1.8–3.8) and symptoms of depression (aOR: 2.7, 95% CI: 1.8–4.02) were positively associated with TDV among SMY. Additionally, binge drinking was associated with a significantly greater risk of victimization for SMY (aOR = 2.7, 95% CI 1.9–3.9) than heterosexual youth (aOR = 1.5, 95% CI 1.2–2.0).

Conclusions Our results suggest that while both exposures are associated with an increased risk of both physical and sexual TDV, binge drinking may contribute to the disparate rates of dating violence impacting SMY.

Keywords Teen Dating Violence · Sexual Minority Youth · Binge Drinking · Depression

Introduction

Teen dating violence (TDV) is a prevalent public health concern that impacts the wellbeing of millions of youth in America, particularly sexual minority youth (lesbian, gay, bisexual, transgender, and queer [LGBTQ]) (National Center for Injury Prevention & Control, 2022). TDV can consist of multiple behaviors including physical or sexual abuse, stalking, psychological aggression, and/or coercive control between romantic partners. Among high school students in the US who have dated, over 20% of female and 10% of male students report experiencing some form of TDV (Vagi et al., 2015). Additionally, most of these students report multiple incidents of violence, suggesting these experiences are not isolated events. A growing body of literature has identified several individual risk factors for TDV victimization, among those, alcohol use and depressive symptoms are commonly indicated in many studies (Glass et al., 2003; Edwards et al., 2021; Parker & Bradshaw, 2015; Temple & Freeman, 2011; Helweg–Larsen et al., 2008; Brooks-Russell et al., 2013; Cascardi, 2016).

Sexual minority youth consistently report higher rates of TDV than their heterosexual peers (Basile et al., 2020; Luo et al., 2014; Dank et al., 2014; Whitton et al., 2019). Bisexual youth and youth who report sexual contact with more

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than one gender have demonstrated even greater vulnerability when compared to other SMY (Martin-Storey, 2015; Rostad et al., 2020). However, it is not clear what specific exposures contribute to the increased risk of victimization among SMY (Waterman et al., 2019; Parker & Bradshaw, 2015; Lehrer et al., 2006; Glass et al., 2003). Recent data has shown that the number of adolescents who self-identify as a sexual minority nearly doubled, from 7.3% to 2009 to 14.3% in 2017, further emphasizing the importance of targeted research and interventions for this population (Raifman et al., 2020).

Because adolescence is a critical period of development, experiencing interpersonal violence during this time can have a lasting effect on overall development and health that will continue into adulthood (Blakemore & Mills, 2014; Silverman, 2001). In addition to injuries sustained due to the abuse, survivors of TDV are at increased risk for mental health concerns including anxiety, depression, and suicidal ideation (Banyard & Cross, 2008; Callahan et al., 2003; Coker et al., 2000; Exner-Cortens et al., 2013; Tharp et al., 2017). TDV is also associated with increased risky health behaviors that can cause harm both in adolescence and beyond, such as substance use and high-risk sexual behavior (Silverman, 2001; Vagi et al., 2015). Additionally, as an adverse childhood experience (ACE), TDV predisposes survivors to an increased burden of chronic disease, such as hypotension or diabetes, at an earlier onset (Danese et al., 2009; Sonu et al., 2019).

Minority Stress Theory has been widely used to contextualize the many health disparities affecting sexual minorities, including the high rates of intimate partner violence. This theory suggests that as a marginalized group, SMY experience increased internal and external stressors related to their sexual identity (Bränström et al., 2016; McCabe et al., 2010; Meyer, 2003). In addition, systemic disenfranchisement of marginalized populations limits access to resources and support that can help moderate the effects of these stressors (Meyer et al., 2008). Internal stressors, such as identity conflict, and external stressors, such as homophobia, contribute to the adversity burden SMY must grapple with. Increased adversity burden is tied to increased harmful health behaviors, such as binge drinking and mental health concerns (Baams et al., 2015, 2018; Bränström et al., 2016; McCabe et al., 2010). Sexual minorities consistently report more frequent and heavier alcohol use than heterosexual youth (Talley et al., 2014). Additionally, sexual minorities report significantly higher rates of poor mental health outcomes, including depression.

and more than half of SMY who report wanting mental health services say they have not been able to access care (Steele et al., 2017; The Trevor Project National Survey Results 2021, 2021). A 2020 survey-based study by Edwards et al. (2020) found that sexual minority girls in grades 7–10 reported higher rates of sexual victimization than their heterosexual peers, and that binge drinking and depression fully mediated the relationship between sexual minority identity and victimization (Edwards et al., 2020). Further exploration into the role of binge drinking and depressive symptoms in TDV occurring among SMY could allow for improved prevention measures and health outcomes.

The relationship between TDV and both alcohol use and depressive symptoms is widely acknowledged. A 2015 study found that recent alcohol use is associated with an increased risk of experiencing physical and verbal TDV among high school students, with frequent use of alcohol increasing the odds of experiencing both forms of TDV (Parker et al., 2016). Additionally, the relationship between intimate partner violence and alcohol appears to remain consistent over time. A study examined the longitudinal association between alcohol and dating violence among female high school students. The results indicated that the co-occurrence of alcohol use and dating violence persisted over the course of three years (Choi et al., 2017). While it has been well established that experiencing intimate partner violence at any age can increase the risk for depression or depression symptoms, there is also evidence that this relationship is bidirectional (Brooks-Russell et al., 2013; Collibee et al., 2021). A 2021 study demonstrated that the severity of depression symptoms is positively associated with risk of physical dating violence among adolescent girls and that differences in symptom severity mediated the effectiveness of violence prevention programing (Collibee et al., 2021). The positive association between drinking and intimate partner violence, as well as depressive symptoms and intimate partner violence is significant for both men and women in heterosexual relationships (Anderson, 2002).

Similar associations have been observed in adult sexual minority populations, suggesting binge drinking and psychological or emotional distress are associated with an increased risk of experiencing IPV (Goldberg & Meyer, 2013; Lewis et al., 2015). A 2015 study demonstrated that emotional distress, including negative affect, brooding, and depression, was positively associated with bidirectional IPV among lesbians between the ages 18–35 (Lewis et al., 2015). Furthermore, participants who experienced emotional distress were more likely to use alcohol as a coping mechanism and report risky alcohol use, a behavior that was identified as a risk factor for bidirectional IPV (Lewis et al., 2015). A 2017 by Lewis et al. proposed a novel model demonstrating links between sexual minority discrimination, alcohol use, and IPV among partnered lesbian women (Lewis et al., 2017).

While alcohol use and mental health concerns, including depression, are consistently recognized as risk factors

for IPV, the mechanisms underlying these relationships are less easily identified. Alcohol intoxication can increase the risk of victimization due to an impaired ability to recognize or respond to environmental cues, such as escalating partner aggression (Eckhardt et al., 2015; Temple & Freeman, 2011). Similarly, symptoms of depression may impede a victim's ability to accurately assess their partner's abusive behavior and take steps to leave the relationship (Edwards et al., 2011; Gidycz et al., 2006). Additionally, both depression and alcohol use, particularly in an under-aged population, are associated with significant stigma which creates a barrier to care for both heterosexual and SMY. However, as a result of their sexual identity SMY may have less access to familial or community support to address these concerns, making them more vulnerable to experiencing abuse (Meyer et al., 2008).

The purpose of this study is to assess whether binge drinking and symptoms of depression are associated with TDV among SMY. Additionally, we will explore if these associations differ between sexual minority and heterosexual populations. By utilizing a nationally representative sample of high school students in the United States, we hope to fill some gaps in this body of literature, which primarily focuses on dating violence among college students and rarely assesses TDV among SMY. Additionally, much of the existing research uses any drinking behavior as a risk factor for TDV. By narrowing our focus to binge drinking, we will gain a better understanding of how this form of high-risk alcohol use is associated with abusive relationships within our study population. We hypothesized that (1) SMY who report binge drinking or symptoms of depression will have a higher likelihood of experiencing TDV and (2) that these associations will be stronger in SMY than heterosexual youth.

Methods

The current study utilizes data collected through the national Youth Risk Behavior Surveillance System (YRBSS). The YRBSS is conducted by the Center for Disease Control (CDC) to assess key health behaviors among a nationally representative sample of 9th – 12th grade students in the US. YRBSS consists of a self-administered, 99 item questionnaire that is conducted every two years using a three-stage cluster sample design (Underwood et al., 2020). To adjust for nonresponse and oversampling of Black and Hispanic students, a weighting factor is applied to each sampled student (Youth Risk Behavior Surveillance System, 2020). The YRBSS allows respondents to identify their sexual identity as heterosexual, gay/lesbian, bisexual, or unsure. For the purposes of this study, SMY will refer to those who identified as gay/lesbian, bisexual, or questioning in the survey; students who did not respond to this question were excluded.

We combined cross-sectional data collected from 2017 to 2019, resulting in a total sample size of 42,119 students (CDC, 2014). For the first stage of analysis, the primary study population only included SMY (n = 6,340) who had dated in the last year (n = 4,229), responded to at least one survey question assessing TDV (n = 3,963), and responded to both survey questions assessing depression symptoms and binge drinking (n = 3,424). For the comparison analysis, heterosexual youth who met the same inclusion criteria (n = 20,255) were combined with the primary study population.

Measures

Independent Variables

Symptoms of Depression YRBSS assesses history of depression or depression symptoms through one binary yes/no variable: "During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?"

Binge Drinking Current binge drinking behavior is determined through the question "During the past 30 days, on how many days did you have 4 or more drinks of alcohol in a row, that is, within a couple of hours (if you are female) or 5 or more drinks of alcohol in a row, that is, within a couple of hours (if you are male)?" Responses ranged from 0 to 20 or more days. For this study responses were collapsed to create a binary yes/no exposure variable.

Dependent Variables

Teen Dating Violence YRBSS contains two measures of TDV. The first question asks "During the past 12 months, how many times did someone you were dating or going out with 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.)" Responses for both questions ranged from 0 to 6 or more times or participants could indicate that they did not date anyone in the past year. Responses were collapsed to create a binary yes/no exposure variable, excluding those who did not have a relationship in the past year.

The second question asks "During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon.)". Responses for both questions ranged from 0 to 6 or more times or participants could indicate that they

did not date anyone in the past year. Responses were collapsed to create a binary yes/no exposure variable, excluding those who did not have a relationship in the past year.

Additionally, responses to both questions were combined to create a binary yes/no exposure variable to measure any experience of TDV.

Covariates

Covariates were identified based on a Directed Acyclic Graph (DAG), a graphic description of the presupposed causal pathway of the questions of interest. Variables were selected a priori; these included sex, race/ethnicity, age, grade, history of drug use. Each variable was represented as a node within the DAG and connected within the pathway via arrows in order to identify potential confounding. Sex was a binary male/female variable. Race/ethnicity was created as a six-level categorical variable that included White, Asian American and Pacific Islander (AAPI)/ Native Hawaiian, Black/African American, American Indian/Alaska Native, Hispanic/Latino, and Mixed. History of drug use was a binary variable created by combining responses from survey questions assessing any previous use of marijuana, cocaine, heroin, methamphetamines, ecstasy, LSD, and any inhalants or injected illicit substances.

Statistical Analysis

We used descriptive analysis with weighted percentages to assess the prevalence of binge drinking, feeling sad/hopeless, and physical and sexual TDV (analyzed both separately and combined) among SMY, as well as the covariates.

We created three logistic regression models to estimate the crude and adjusted associations between binge drinking and TDV and feeling sad or hopeless and TDV. Multivariable analyses included both exposures in the same model and controlled for covariates that were selected a priori, except grade. Grade was not included to create a more parsimonious model, as it was not associated with the outcomes ($p > 0.1$) and the removal did not change the main effect by $> 10\%$.

Using the SMY population, three models were created, one for each of the TDV outcomes (Any, Sexual, or Physical violence). Each model included both exposure variables (binge drinking and sad/hopeless). To assess differences in association between the two exposure variables and experiencing any form of TDV by sexual minority identity we also performed interaction analysis. Additionally, we hypothesized that the associations of binge drinking and feeling sad/hopeless might be stronger in sexual minority youth. Therefore, we expanded the study population to include all youth (SMY and heterosexual youth) and tested for interaction by generating cross-product terms between each exposure and sexual minority status. The alpha for statistical significance was set at $p < 0.05$. All analyses were performed using Stata BE 17.0 (StataCorp. 2021).

Our study was exempt from full human subjects review by the University of California, Berkeley Center for the Protection of Human Subjects as the data used are deidentified and publicly available online.

Results

Table 1. presents the weighted percentages of sexual minority identity, feeling sad or hopeless, binge drinking behavior, any experience of dating violence, and associated covariates. Based on an analytical sample of 3,424 SM high school students, an estimated 21.9% of SMY in the United States have experienced TDV in the past year. A population estimate of 51% of these youth have experienced feeling sad or hopeless in the past year, 4.7% have engaged in binge drinking, and 14.4% experienced both exposures.

Table 2. presents the distribution of covariates by exposure. There were significant differences in the population estimate of feeling sad or hopeless in the past year by sexual minority identity, sex, race/ethnicity, and history of drug use. Female SMY (70.9%) reported a higher population estimate for feeling sad or hopeless than males (47.4%). Among racial/ethnic groups, Mixed SMY had the highest report of feeling sad or hopeless (77.0%), followed by Hispanic/Latino (66.3%), White (69.4%), AAPI/Native Hawaiian (67.4%), Black/African American (44.9%), and American Indian/Alaskan Native (30.6%).

There were significant differences in the population estimate of binge drinking in the past 30 days by age, race, and history of drug use. Among racial/ethnic groups, American Indian/Alaskan Native SMY had the highest population estimate for binge drinking (21.9%), followed by White (21.5%), Hispanic/Latino (19.9%), Mixed (15.0%), AAPI/Native Hawaiian (17.7%), and Black/African American (10.3%).

Table 3. presents the distribution of covariates by TDV outcomes. There were significant differences in the population estimates of Any Dating Violence between sexual minority identities. Gay/Lesbian SMY had the lowest estimates of Any TDV at 14.8%, bisexual SMY had the highest at 24.4%, followed by questioning SMY at 19.9%. Female SMY and those with a history of drug use also demonstrated significantly higher population estimates of TDV than their respective counterparts.

The only significant difference in the population estimates of Physical Dating Violence is between those who

Table 1 Weighted percentages of selected characteristics among Sexual Minority Youth (SMY) in the Youth Risk Behavior Surveillance Survey (YRBSS) from 2017 and 2019. n = 3,424

	N	Weighted %
Sexual Minority Identity		
Gay/Lesbian	584	16.01%
Bisexual	2,089	62.07%
Questioning	751	21.92%
Sad/Hopeless + Binge Drinking		
Neither	1,021	29.93%
Sad/Hopeless Only	1,765	50.98%
Binge Drinking Only	184	4.66%
Sad/Hopeless and Binge Drinking	454	14.43%
Any Dating Violence (Sexual or Physical)		
No	2,676	78.09%
Yes	748	21.91%
Sex		
Male	752	23.66%
Female	2,602	76.34%
Age		
14 and younger	428	11.68%
15	807	23.22%
16	917	26.46%
17	806	24.11%
18 and older	446	14.53%
Grade		
9th	844	23.62%
10th	950	27.10%
11th	816	25.12%
12th	772	24.16%
Race/Ethnicity		
White	1,500	51.24%
AAPI/Native Hawaiian	103	2.82%
Black/African American	625	14.05%
American Indian/Alaska Native	33	0.49%
Hispanic/Latino	825	25.07%
Mixed	245	6.32%
Age of Alcohol Initiation		
Never	1,024	31.93%
10 and younger	467	13.52%
11–12 yrs	330	9.21%
13–14 yrs	714	21.46%
15–16 yrs	641	19.93%
17 yrs and older	111	3.95%
History of Drug Use		
No	1,589	44.80%
Yes	1,821	55.20%

have a history of drug use (18.4%) and those who do not (6.1%).

Significant differences in the population estimates of sexual dating violence are present between sexual minority identities. Bisexual SMY had the highest at 17.8%, followed by questioning SMY at 14.1%, and gay/lesbian SMY at 7.5%. Female SMY had significantly higher estimates of sexual dating violence (16.9%) when compared to males (9.59%). There were also significant differences between SMY with and without a history of drug use.

Table 4. presents results of multivariate logistic regression analyses conducted in the subpopulation of SMY for the three TDV outcomes (any TDV, physical TDV, and sexual TDV) in relation to either feeling sad/hopeless or binge drinking. Feeling sad/hopeless was significantly associated with any TDV (adjusted odd ratio [aOR] = 2.7, 95% confidence interval [CI] 1.8–4.02), physical TDV (aOR = 2.6, CI 1.6–4.2), and sexual TDV (aOR = 2.7, CI 1.6–4.8). Binge drinking was also significantly associated with any TDV (aOR = 2.6, CI 1.8–3.8), physical TDV (aOR = 3.4, CI 2.2–5.2), and sexual TDV (aOR = 2.2, CI 1.4–3.3).

To better assess the differences between sexual minority identities we tested for effect modification for both exposures in relation to experiencing any form of TDV. Youth who identified as questioning and engaged in binge drinking were at significantly greater risk (Interaction P-value = < 0.001, aOR = 2.8, 95% CI 1.8–4.5) when compared to their gay/lesbian (aOR = 1.6, 95% CI 0.92–2.7) and bisexual peers (aOR = 1.1, 95% CI 0.83–1.5). A significant interaction was also seen when looking at the association between feeling sad/hopeless and experiencing TDV. Bisexual youth with these depression symptoms were at significantly lower risk of victimization (Interaction P-value = < 0.001, aOR = 0.61, 95% CI 0.46–0.8) when compared to gay/lesbian youth (aOR = 0.78, 95% CI 0.44–1.4) and questioning youth (aOR = 1.27, 95% CI 0.79–2.0).

Table 5. presents the results from the two interaction analyses used to determine if differences existed in the two exposure and outcome relationships in SMY and their heterosexual peers. Both feeling sad/hopeless and binge drinking were associated with increased risk of experiencing TDV for both SMY and heterosexual youth. However, no effect modification was found when comparing the association between feeling sad/hopeless and experiencing any TDV. A significant interaction was seen when comparing the associations between binge drinking and experiencing any TDV among SMY and heterosexual youth (Interaction P-value = < 0.01). Binge drinking was associated with a significantly greater risk of victimization for SMY (aOR = 2.7, 95% CI 1.9–3.9) than heterosexual youth (aOR = 1.5, 95% CI 1.2–2.0).

Discussion

We found that, in a nationally representative sample of high school students, both binge drinking and feeling sad/hopeless are strongly associated with physical and sexual TDV among SMY. Furthermore, binge drinking is associated

Table 2 Selected characteristics by exposure to feeling sad/hopeless or binge drinking among SMY in the Youth Risk Behavior Surveillance Survey (YRBSS) from 2017 and 2019. n = 3,424

	No		Yes		F Test	P-value
	N	Weighted %	N	Weighted %		
Sad/Hopeless						
Sexual Minority Identity					9.0589	< 0.001
Gay/Lesbian	239	39.97%	345	60.03%		
Bisexual	631	29.76%	1458	70.24%		
Questioning	335	44.34%	416	55.66%		
Sex					61.8562	< 0.001
Male	386	52.61%	366	47.39%		
Female	794	29.14%	1808	70.86%		
Age					0.6579	0.61
14 and younger	151	33.49%	277	66.51%		
15	275	35.01%	532	64.99%		
16	298	31.74%	619	68.26%		
17	283	34.86%	523	65.14%		
18 and older	191	39.17%	255	60.83%		
Race/Ethnicity					10.4961	< 0.001
White	448	30.61%	1052	69.39%		
AAPI/ Native Hawaiian	34	32.56%	69	67.44%		
Black/African American	332	55.13%	293	44.87%		
American Indian/ Alaska Native	17	69.39%	16	30.61%		
Hispanic/Latino	266	33.75%	559	66.25%		
Mixed	65	23.00%	180	77.00%		
History of Drug Use					38.8309	< 0.001
No	675	43.28%	923	56.72%		
Yes	528	27.57%	1293	72.43%		
Binge Drinking						
Sexual Minority Identity					0.2907	0.75
Gay/Lesbian	462	80.60%	122	19.40%		
Bisexual	1698	80.41%	391	19.59%		
Questioning	626	82.56%	125	17.44%		
Sex					1.0838	0.3
Male	625	83.63%	127	16.37%		
Female	2,118	80.33%	484	19.67%		
Age					5.299	< 0.001
14 and younger	340	82.35%	88	17.65%		
15	705	89.03%	102	10.97%		
16	763	82.38%	154	17.62%		
17	627	76.85%	179	23.15%		
18 and older	338	71.24%	108	28.76%		
Race/Ethnicity					2.3703	0.046
White	1193	78.54%	307	21.46%		
AAPI/ Native Hawaiian	88	82.32%	15	17.68%		
Black/African American	551	89.74%	74	10.26%		
American Indian/Alaska Native	27	78.09%	6	21.91%		
Hispanic/Latino	654	80.12%	171	19.88%		
Mixed	208	85.05%	37	14.95%		
History of Drug Use					155.517	< 0.001
No	1517	96.38%	81	3.62%		
Yes	1264	68.33%	557	31.67%		

Table 3 Covariate by TDV outcomes among SMY in the Youth Risk Behavior Surveillance Survey (YRBSS) from 2017 and 2019. n = 3,424

	No		Yes		F Test	P-value
	N	Weighted %	N	Weighted %		
Any Dating Violence						
Sexual Minority Identity					4.9845	< 0.01
Gay/Lesbian	471	85.19%	113	14.81%		
Bisexual	1613	75.55%	476	24.45%		
Questioning	592	80.11%	159	19.89%		
Sex					2.0544	0.16
Male	611	81.75%	141	18.25%		
Female	2028	77.45%	574	22.55%		
Age					1.9694	0.10
14 and younger	327	75.93%	101	24.07%		
15	653	83.40%	154	16.60%		
16	716	77.74%	201	22.26%		
17	604	74.09%	202	25.91%		
18 and older	362	79.50%	84	20.50%		
Race/Ethnicity					1.3653	0.24
White	1167	77.43%	333	22.57%		
AAPI/ Native Hawaiian	91	87.40%	12	12.60%		
Black/African American	520	83.42%	105	16.58%		
American Indian/ Alaska Native	26	78.33%	7	21.67%		
Hispanic/Latino	627	77.53%	198	22.47%		
Mixed	183	72.77%	62	27.23%		
History of Drug Use					50.5408	< 0.001
No	1371	87.52%	227	12.48%		
Yes	1303	70.51%	518	29.49%		
Physical Dating Violence						
Sexual Minority Identity					0.5348	0.58
Gay/Lesbian	488	88.01%	94	11.99%		
Bisexual	1799	86.29%	284	13.71%		
Questioning	618	84.89%	127	15.11%		
Sex					0.6276	0.43
Male	624	0.8524	123	0.1476		
Female	2243	87.16%	352	0.1284		
Age					1.5786	0.18
14 and younger	360	0.8512	65	0.1488		
15	707	0.9026	96	0.0974		
16	780	0.8687	134	0.1313		
17	665	0.8424	141	0.1576		
18 and older	378	0.8408	64	0.1592		
Race/Ethnicity					0.3444	0.86

Table 3 (continued)

	No		Yes		F Test	P-value
	N	Weighted %	N	Weighted %		
White	1673	87.71%	253	12.29%		
AAPI/ Native Hawaiian	122	91.27%	9	8.73%		
Black/African American	714	89.32%	106	10.68%		
American Indian/ Alaska Native	40	83.64%	8	16.36%		
Hispanic/Latino	805	87.10%	138	12.90%		
Mixed	241	86.24%	43	13.76%		
History of Drug Use					47.8688	< 0.001
No	1953	93.88%	156	6.12%		
Yes	1725	81.64%	432	18.36%		
Sexual Dating Violence						
Sexual Minority Identity					7.2774	< 0.01
Gay/Lesbian	455	92.54%	48	7.46%		
Bisexual	1505	82.23%	276	17.77%		
Questioning	533	85.92%	92	14.08%		
Sex					7.7816	< 0.01
Male	591	90.41%	59	9.59%		
Female	1866	83.10%	343	16.90%		
Age					1.1055	0.35
14 and younger	283	82.69%	58	17.31%		
15	564	88.72%	82	11.28%		
16	689	82.82%	124	17.18%		
17	590	82.84%	106	17.16%		
18 and older	352	86.98%	44	13.02%		
Race/Ethnicity					2.2477	0.06
White	1125	84.04%	199	15.96%		
AAPI/ Native Hawaiian	71	86.81%	10	13.19%		
Black/African American	477	92.60%	34	7.40%		
American Indian/ Alaska Native	23	91.66%	2	8.34%		
Hispanic/Latino	596	82.83%	126	17.17%		
Mixed	150	78.61%	39	21.39%		
History of Drug Use					39.092	< 0.001
No	1245	91.21%	137	8.79%		
Yes	1247	79.26%	277	20.74%		

Table 4 Association of Feeling Sad/Hopeless or Binge Drinking with TDV among SMY in the Youth Risk Behavior Surveillance Survey (YRBSS) from 2017 and 2019. n = 3,424

	Model 1: Any Dating Violence				Model 2: Physical Dating Violence				Model 3: Sexual Dating Violence			
	OR	(95% CI)	aOR	(95% CI)	OR	(95% CI)	aOR	(95% CI)	OR	(95% CI)	aOR	(95% CI)
Sad/Hopeless												
No		*Ref*			Ref				*Ref*			
Yes	2.9	(1.9, 4.5) ***	2.7	(1.8, 4.02) ***	2.5	(1.5, 4.3) ***	2.6	(1.6, 4.2) ***	3.4	(2.0, 5.9) ***	2.7	(1.6, 4.8) ***
Binge Drinking												
No		*Ref*			Ref				*Ref*			
Yes	3.7	(2.6, 5.2) ***	2.6	(1.8, 3.8) ***	4.7	(3.2, 7.0) ***	3.4	(2.2, 5.2) ***	3.1	(2.1, 4.5) ***	2.2	(1.4, 3.3) ***

All adjusted models included: sad/hopeless, binge drinking, sexual minority identity, sex, age, race/ethnicity, and history of drug use. **P < 0.01. ***P < 0.001. Abbreviations: TDV = Teen Dating Violence SMY = Sexual Minority Youth

Table 5 Sexual Identity as an Effect Modifier in Relationship Between Feeling Sad/Hopeless or Binge Drinking and TDV in the Youth Risk Behavior Surveillance Survey (YRBSS) from 2017 and 2019. n = 22,798

	Sexual Minority		Heterosexual		Interaction P-value
	aOR	(95% CI)	aOR	(95% CI)	
Any TDV					
Sad/Hopeless	2.7	(1.8–4.0)	3.4	(2.7–4.3)	0.29
Binge Drinking	2.7	(1.9–3.9)	1.5	(1.2–2.0)	< 0.01

Separate models were created for Feeling Sad/Hopeless and Binge Drinking. Both models controlled for sex, age, race/ethnicity, and history of drug use. Abbreviations: TDV = Teen Dating Violence

with a greater risk of victimization for SMY than heterosexual youth. However, SMY should not be viewed monolithically as risk varied by sexual minority identity. Previous research on TDV has primarily centered heterosexual youth, with less of a focus on the specific risk factors affecting SMY. To our knowledge, this is the first study to examine how depressive symptoms and binge drinking are associated with both physical and sexual TDV among SMY in a nationally representative sample of high school students and to compare these relationships with heterosexual youth.

It is not surprising that binge drinking was significantly associated with all three categories of TDV considering the robust body of literature that supports the hypothesis that substance use increases the risk of dating violence victimization. There are several theories as to why alcohol use leads to victimization; one explanation is that the physiological effects of heavy alcohol use make youth more vulnerable to abuse (Temple & Freeman, 2011). Binge drinking has been linked to impaired cognition and emotional dysregulation; experiencing this could make it more difficult for SMY to navigate high-risk situations that result in TDV (Briones & Woods, 2013; Stephens & Duka, 2008). Additionally, it is possible that binge drinking reported by TDV survivors is indicative of the perpetrator's risky drinking behavior (Bartel et al., 2020). Numerous studies have found an association between substance use and dating violence perpetration (Haynie et al., 2013; Shorey et al., 2011; Temple et al., 2013).

Minority stress theory offers some context as to why binge drinking would differentially impact SMY. In addition to the common stressors associated with adolescence, SMY must manage the adversity burden associated with their marginalized status, often with less access to the resources or safety net that could mitigate the consequences of risky drinking behaviors (Lewis et al., 2015; Meyer et al., 2008; The Trevor Project National Survey Results 2021, 2021). In addition to formal forms of intervention, social support,

particularly from family members, can reduce the harm caused by alcohol misuse (Villar et al., 2022). Social support is thought to improve health outcomes by providing a buffer that allows the supported individual to more effectively assess and respond to stressful situations (Pauley & Hesse, 2009; Villar et al., 2022). A perceived lack of social support and belonging is commonly noted to be a concern for SMY, and is associated with poorer wellbeing, including an increased risk of victimization (Button et al., 2012; Perales & Campbell, 2020). While both heterosexual and sexual minority youths may be participating in similar binge drinking behaviors, SMY may be less insulated from the associated harms than their heterosexual peers.

Similar to substance use, it is possible that poor mental health increases vulnerability to dating violence by compromising SMY's perceived agency to leave a perpetrator (Foshee, 2004; Roberts et al., 2003; Vézina & Hébert, 2007). Youth who have experienced depression or psychological distress are less likely to recognize their own vulnerability, "red flags" in their relationship, or alternative partners (Edwards et al., 2011; Gidycz et al., 2006). As a result, depressed youth are more likely to begin and stay in an abusive relationship. Furthermore, symptoms of depression can be perceived by perpetrators as signs of vulnerability, leading them to preferentially pursue relationships with these youth (Tran et al., 2012).

It is less clear, however, why symptoms of depression, unlike binge drinking, were not associated with an increased risk of TDV among SMY when compared to heterosexual peers. While SMY have higher rates of depression symptoms, this did not correlate with a significantly stronger association with TDV for SMY. It is possible that the broad description of "feeling sad or hopeless" fails to capture the specific dimensions of depression that differentially impact SMY and their relationships. Particularly, as this is a binary variable, it may not accurately represent differences in the severity of symptoms. Because the survey asks participants to consider their emotional state over the past 12 months, recall bias may have impacted the validity of the data. Additionally, it is also possible that the mechanisms underlying the strong association between depression symptoms and TDV do not operate differently between the two populations, and this could be a reason we do not see a difference in association between SMY and their heterosexual peers.

While these findings offer new insights, some limitations should be considered. First, the use of cross-sectional data does not allow for the assessment of temporal relationships. We cannot be certain that the sequential categorization of depressive symptoms and binge drinking as exposures that lead to TDV is accurate. Both symptoms of depression and binge drinking could result from the trauma of experiencing TDV. In addition, the YRBSS only asks about sex, not gender. This limitation, as well as the limited sexual identity categories (heterosexual, gay/lesbian, bisexual, or questioning) fail to capture the full spectrum of gender and sexuality, possibly causing some participants to skip the questions or choose an option that does not accurately represent their identity. Additionally, due to the sensitive nature of these survey items it is likely that some participants did not feel comfortable responding and we are missing data that reflects their experiences. Furthermore, in an effort to avoid arbitrarily combining racial and ethnic groups there are some small cell sizes. Finally, we were not able to assess or control for characteristics of socioeconomic status based on the available items included in the YRBSS.

Despite these limitations, our study has several strengths. The large sample size taken from a nationally representative population suggests greater generalizability of the results. Additionally, unlike many other studies that assess the role of general alcohol usage in experiences of TDV, our research was able to isolate binge drinking specifically. We were also able to analyze two separate forms of TDV, physical violence and sexual violence. Finally, this study helps to address the lack of research into the specific risk factors that affect SMY to better understand why this population is disproportionately impacted by TDV.

This study indicates that both feeling sad/hopeless and binge drinking puts SMY at higher risk for both physical and sexual TDV. Furthermore, binge drinking is associated with greater risk of TDV in SMY than heterosexual youth who engage in the same behavior. Our research suggests that interventions targeting depression and binge drinking may reduce rates of TDV. These findings highlight the need for programming tailored to the specific needs of SMY. Future research should utilize longitudinal methodologies to determine the temporal relationship between symptoms of depression, binge drinking, and TDV. Additionally, this methodology may allow for a better understanding of the mechanisms that underlie the associations described in our findings; particularly, the differential impact of binge drinking on SMY health and wellbeing.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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