



Sexual minority youth's mental health and substance use: The roles of victimization, cybervictimization, and non-parental adult support

Meg D. Bishop¹ · Salvatore Ioverno² · Stephen T. Russell¹

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Abstract

Victimization is a well-established driver of sexual minority youth's (SMY) mental health and substance use risk. The current study examined and extended this research by exploring how victimization, cybervictimization, and non-parental supportive adults contribute to SMY's vulnerability to poor mental health and substance use. Using data from the first representative sample of Texas youth that measures sexual identity, we analyzed sex-stratified models of the association between sexual identity, mental health, and substance use, and the confounding effects of victimization, cybervictimization, and non-parental adult support. Victimization was more common among SMY and accounted for a greater proportion of sexual identity disparities on mental health and substance use, especially for males. Sexual minority females were more likely to report cybervictimization than heterosexual youth, and cybervictimization was associated with mental health risk. SMY reported fewer available non-parental supportive adults, which was associated with more sadness, suicidality, and polysubstance use. Our study adds to extant evidence that victimization drives SMY's increased susceptibility to mental health and substance use risk. Schools should implement inclusive policies that prohibit bullying based on sexual minority identity and offer professional development opportunities for supporting SMY.

Keywords Sexual and gender minorities · Victimization · Mental health · Adolescent · Substance-related disorders

Introduction

Mental health and substance use risk behaviors often emerge in adolescence and may result in lifelong health repercussions. Recent data suggests that suicide is the second leading cause of premature death among youth aged 10–24 in the United States (Curtin & Heron, 2019), and the overwhelming majority of youth with suicidal behaviors also exhibit depressive symptoms (Brent & Birmaher, 2002). Alcohol and substance use heighten

youth's vulnerability to disease, violence, and substance dependence as adults (Goldbach et al., 2014; Marshal et al., 2008). Given their associations with morbidity and mortality, it is crucial to identify the exacerbating and buffering mechanisms driving adolescents' early health risk behaviors.

Decades of research have documented disparities in poor mental health and substance use behaviors between sexual minority youth (i.e., SMY) and their heterosexual peers due to SMY-specific discrimination and stigma. Suicidal ideation and behavior are almost 2.5 times more common among SMY relative to heterosexual youth, and SMY are more likely to abuse alcohol and use illicit drugs than heterosexual youth (Kann, 2016). Particularly troubling is that sexual orientation-related disparities may not be diminishing for some youth, despite improvements in cultural acceptance and visibility of sexual minority identity over time (Fish et al., 2017; Russell & Fish, 2019; Watson et al., 2018). As such, key public health organizations have underscored the urgent need to identify the modifiable mechanisms that exacerbate and buffer enduring inequities in mental health and substance use between SMY and their heterosexual peers (National Academies of Sciences, Engineering, and Medicine, 2020; National Institutes of Health, 2020). In the current study, we analyze data from the 2017 Texas Youth Risk

✉ Meg D. Bishop
meg.bishop@utexas.edu

Salvatore Ioverno
Salvatore.Ioverno@ugent.be

Stephen T. Russell
stephen.russell@utexas.edu

¹ Department of Human Development and Family Sciences, University of Texas at Austin, 108 E. Dean Keeton St., Stop A2702, Austin, TX 78712, USA

² Department of Sociology, Ghent University, St. Pietersnieuwstraat 33, 9000 Ghent, Belgium

Behavior Survey, the first representative sample of Texas high-school aged youth measuring sexual identity, to extend the literature documenting sexual identity-based disparities in mental health and substance use, and to examine the confounding effects of victimization, cybervictimization, and non-parental adult support.

Victimization and Cybervictimization

Victimization is deleterious to youth regardless of their sexual orientation. Minority Stress Theory (Meyer, 2003) posits that differences in health statuses between SMY and their heterosexual peers can be attributed to unique minority stressors such as victimization, expectations of rejection, concealment of a sexual orientation, and internalized homophobia. During adolescence, cognizance of peer evaluation is heightened and social regulation of norms related to gender and sexuality are particularly rigid (Pellegrini & Bartini, 2000), resulting in pervasive victimization in the lives of SMY (Johns, 2018; Kann, 2016). Further, a robust literature has demonstrated the association between victimization with depressive symptoms, suicidality, and substance use for SMY (e.g., Burton et al., 2013; Coulter et al., 2019; Fish et al., 2019; Goldbach et al., 2014; National Academies of Sciences, Engineering, and Medicine, 2020; Russell et al., 2011). Additionally, prior studies suggest important sex differences in the experiences of victimization for SMY. For example, male SMY have been shown to report more bias-based victimization than female SMY (Johns, 2018; Toomey & Russell, 2016). Victimization is a clear precursor to poor health among SMY, and understanding sex differences in victimization experiences can assist with developing effective prevention and intervention efforts.

Cybervictimization, the use of digital technology to communicate aggression and/or to inflict harm (Abreu & Kenny, 2018), is increasingly common among contemporary youth. Results from a recent systematic review reported that 20%–40% of children and adolescents have been cyberbullied (Aboujaoude et al., 2015), with another recent systematic review reporting heightened risk for sexual and gender minority youth relative to their heterosexual and cisgender peers (Abreu & Kenny, 2018). Among SMY, cybervictimization is linked with psychological problems including suicidality, depression, and low self-esteem (Duong & Bradshaw, 2014; Schneider et al., 2012; Sinclair et al., 2012); behavioral issues such as increased risk of physical fights (Duong & Bradshaw, 2014); and poor academic performance (Schneider et al., 2012). Additionally, the association between cybervictimization and health risk may be stronger for SMY than for their heterosexual peers (Abreu & Kenny, 2018).

Although a small body of literature has outlined prevalence and correlates of cybervictimization among SMY, studies of cybervictimization to date have largely relied on community samples of youth affiliated with SMY-related organizations (Abreu & Kenny, 2018). Further, although research suggests that SMY report cybervictimization more frequently than their heterosexual peers (Hinduja & Patchin, 2020), there is a dearth of research regarding disparities in cybervictimization at the intersection of sex and sexual identity. Additional research with representative samples of SMY is needed to elucidate the experiences and consequences of cybervictimization.

Non-Parental Adult Support

All youth benefit from adult support. However, social support from adults may be especially important for SMY. Adult support can provide practical protection against victimization and can combat ostracism, both of which SMY report at higher rates than their heterosexual peers (Greytak et al., 2013; Joiner et al., 2009; Ribeiro & Joiner, 2009). Indeed, when adults demonstrate support by intervening in bullying, SMY are more likely to feel safe at school and have better academic outcomes (Greytak et al., 2013; Seelman et al., 2015).

Although a body of literature focuses on the role of parental support for SMY (Feinstein et al., 2017; Needham & Austin, 2010), fewer studies have examined the influence of support from non-parental adults in the lives of SMY. Additionally, while prior research has suggested that there are important sex differences in access to social support during adolescence (Helsen et al., 2000), less is known about sex differences among SMY.

Only a handful of studies have examined the association between non-parental adult support and health among SMY. One prior study investigating the role of feeling connected to an adult at school on LGB youth's substance use and mental health found that youth who did not feel connected to adults at school were at higher risk for substance use, depression, and suicidality (Seil et al., 2014). Another study found that SMY who reported having an adult at school to which they could turn for support missed significantly fewer days of school due to feeling unsafe relative to those who reported a lack of adult support (Seelman et al., 2012). An additional set of studies found that SMY's reports of school connectedness and adult support at school were associated with lower odds of substance use, bias-based victimization, and school avoidance (Darwich et al., 2012; De Pedro et al., 2017).

The Current Study

In order to promote effective strategies and programs for supporting SMY to thrive, more research is needed to

understand the interlocking contextual factors that protect and threaten SMY's risk for mental health and substance use. Extant literature has established that victimization is a mechanism of SMY health disparities, but less frequently examines specific forms of victimization such as cybervictimization and the role of protective mechanisms such as adult support. Further, sex differences in these mechanisms are understudied. With respect to cybervictimization, disparities at the intersection of sex and sexual identity are inconsistent across studies (Kessel Schneider et al., 2015). Although sex differences in perceived adult support have been documented among heterosexual youth (Landman-Peeters et al., 2005; Rueger et al., 2008; Slavin & Rainer, 1990), less is known about whether the influence of adult support on behavioral risk outcomes varies by sex for SMY. Last, although the relations between sexual-orientation based differences in victimization and health are well-established in the literature, much of this research utilizes data from cities and states with more supportive sociopolitical contexts (e.g., Bostwick et al., 2014; Bouris et al., 2016; Seil et al., 2014) that may be distinctive relative to rest of the United States. Examining these associations among samples of youth in historically less supportive sociopolitical contexts may provide additional insight into mechanisms of health and thriving.

In the current study, we extend the literature by investigating the following research questions: How do victimization and cybervictimization function similarly or distinctly as aggravators of poor mental health and substance use for youth in Texas, and how do these associations vary by sexual identity? Are supportive non-parental adults uniquely protective for SMY's risk for mental health and substance use relative to heterosexual youth? Does the role of victimization, cybervictimization, and supportive non-parental adults on youth's mental health and substance use risk vary by sex?

Methods

Participants and Procedure

Data for the current study come from the 2017 Texas Youth Risk Behavior Survey (YRBS), a biennial survey distributed to classrooms of randomly selected public and charter high schools across the state of Texas in the United States. Information about recruitment and data collection in the YRBS is previously published (Centers for Disease Control and Prevention, 2013).

We conducted a secondary data analysis of survey data from youth who participated in the 2017 Texas YRBS. Our total analytic sample was comprised of 2045 youth and was limited to youth ages 14 and older who provided valid responses to survey items about sexual identity, sex, and age. Of those youth, 306 (14.16%) reported a sexual minority

identity. No racial/ethnic or age differences were present across heterosexual youth and SMY (see Table 1).

Measures

Sexual Identity Sexual identity was measured with one item that asked, "Which of the following best describes you?" Response options included, "Heterosexual (straight)", "Gay or lesbian", "Bisexual", or "Not sure". A binary LGBTQ item was created wherein youth who self-identified as lesbian, gay, bisexual, or not sure were coded as 1, and the remaining participants were coded as 0.

Sex Sex was measured with one binary item that asked, "What is your sex?" Response options included, "Female (0)" and "Male (1)".

Feeling Sad Participants were asked, "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?" Responses were coded 0 for "no" and 1 for "yes".

Suicidality Suicidality was measured with two items. One binary item examined suicidal ideation by asking, "During the past 12 months, did you ever seriously consider attempting suicide?" Responses were coded 0 for "no" and 1 for "yes". A second item measured suicidal attempts by asking, "During the past 12 months, how many times did you actually attempt suicide?" Responses were dichotomized into those who had attempted suicide one or more times during the 12 months before the survey and those who had not.

Binge Drinking Binge drinking was measured using a survey item that asked, "During the past 30 days, on how many days did you have 4 or more drinks of alcohol in a row (if you are female) or 5 or more drinks of alcohol in a row (if you are male)?" We dichotomized this item into participants who had or had not drunk 4 or more drinks of alcohol in a row if female or 5 or more drinks of alcohol in a row if male in the past 30 days.

Marijuana Marijuana use was measured using a survey item that asked, "During the past 30 days, how many times did you use marijuana?" We dichotomized this item into participants who had or had not used marijuana in the past 30 days.

Illicit Drug Use We measured illicit drug use by constructing a binary variable from several other binary variables measuring whether participants ever used cocaine, inhalants, heroin, crystal methamphetamines, ecstasy, or injected drugs. Participants who had ever used any of these drugs were coded

Table 1 Descriptive statistics for study variables by sex and sexual identity

	Heterosexual (<i>n</i> = 1,739)		LGBQ (<i>n</i> = 306)		F/ χ^2
	Females (<i>n</i> = 887) <i>M</i> (<i>SE</i>) <i>n</i> (%)	Males (<i>n</i> = 852) <i>M</i> (<i>SE</i>) <i>n</i> (%)	Females (<i>n</i> = 214) <i>M</i> (<i>SE</i>) <i>n</i> (%)	Males (<i>n</i> = 92) <i>M</i> (<i>SE</i>) <i>n</i> (%)	
<i>Covariates</i>					
Age (Years)	16.11(.12)	16.14(.12)	16.09(.13)	15.93(.12)	.66
White	210(33.54%)	183(30.23%)	38(27.16%)	16(25.16%)	
Black or African American	58(11.62%)	58(12.42%)	15(14.58%)	10(21.41%)	
Hispanic	557(50.38%)	521(49.61%)	138(51.04%)	56(46.95%)	
Other race/ethnicity	43(4.47%)	68(7.74%)	16(7.22%)	6(6.49%)	18.56
<i>Confounders</i>					
Victimization	.44(.03) _{abc}	.53(.03) _{ade}	.70(.06) _{bdf}	1.00(.10) _{cef}	10.94***
Cybervictimization	153(18.27%) _{ab}	68(8.61%) _{ac}	61(28.55%) _{bc}	17(16.22%)	64.94***
Non-Parental Adult Support	3.21(.07) _{ab}	3.23(.11) _{cd}	2.74(.10) _{ac}	2.65(.16) _{bd}	9.88***
<i>Outcomes</i>					
Feeling Sad	363(40.21%) _{abc}	181(21.30%) _{ade}	127(58.88%) _{bd}	44(52.29%) _{ce}	146.66***
Suicidal Thought	146(17.67%) _{abc}	87(9.87%) _{ade}	87(40.57%) _{bd}	39(43.88%) _{ce}	152.76***
Suicidal Attempt	76(10.69%) _{ab}	59(8.65%) _{cd}	41(22.74%) _{ac}	21(28.47%) _{bd}	50.43***
Binge Drinking	82(10.89%)	87 (11.89%)	28 (16.55%) _a	7(6.72%) _a	6.23
Marijuana use	117(13.39%) _{ab}	145(16.47%) _c	58(27.10%) _{ac}	20(23.83%) _b	24.75***
Illicit drug use	84(9.11%) _{ab}	114(12.92%) _c	40(18.99%) _a	26(29.83%) _{bc}	42.48***
Polysubstance use	.26(.02) _{abc}	.41(.04) _{ad}	.58(.10) _b	.90(.16) _{cd}	6.79*

Note. * $p < .05$; ** $p < .01$; *** $p < .001$. Values followed by the same subscripts are significantly different at the $p < .05$ level. Frequencies are unweighted and percentages are weighted.

as (1) “yes”. Those who had never used these drugs were coded as (0) “no”.

Polysubstance Use We measured polysubstance use as using marijuana, cocaine, inhalants, heroin, crystal methamphetamines, ecstasy, or injected drugs. We created a count variable, with scores ranging from 0 (never used any of these drugs) to 8 (used all 7 of these drugs).

Victimization and Cybervictimization The Texas YRBS included 4 items related to victimization: 1) “During the past 12 months, how many times were you in a physical fight? (0=0 times; 7=12 or more times)”, 2) “During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property? (0=0 times; 7=12 or more times)”, 3) “During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school? (0=days; 4=6 or more days)”, and 4) “During the past 12 months, have you ever been bullied on school property? (0=no, 1=yes)”. Except for the last item, the other items were skewed and kurtotic. Therefore, we dichotomized them into (0) zero times or days, and (1) at least one time or day. We conducted a confirmatory factor analysis (CFA) to test the unidimensionality of the index. The examination of CFA model fit indices supported a one-factor model ($RMSEA = .004$; $CFI = 1.00$, $TLI = 1.00$). We

summed the items for a total score (range 0–4). Originally, one item measuring cybervictimization was included in the CFA. However, results showed no adequate fit indices ($RMSEA = .216$; $CFI = 0.77$, $TLI = 0.54$) suggesting the exclusion of this item from the victimization index. Consequently, we measured cybervictimization as a separate binary item: “During the past 12 months, have you ever been electronically bullied?” Response options were (0) “no” or (1) “yes”.

Non-parental Adult Support We measured non-parental adult support with a survey item that asked, “Besides your parents, how many adults would you feel comfortable seeking help from if you had an important question affecting your life?” Response options were, “(0) 0 adults”, (1) “1 adult”, (2) “2 adults”, (3) “3 adults”, (4) “4 adults”, or (5) “5 or more adults”.

Covariates Covariates in the models included age (14–18 years or older) and race/ethnicity (White, Black or African American, Hispanic/Latino, and Another Race including American Indian/Alaska Native, Asian, Native Hawaiian, Multiracial-Hispanic, and Multiracial-non-Hispanic).

Data Analysis

We conducted analyses with the SVY command in STATA version 15 (StataCorp, 2015) to account for sample weights,

stratification, and clustering design. We first calculated basic descriptive statistics among all of our variables. We then conducted linear, logistic, and Poisson regressions to test sex and sexual identity group differences on all study variables. Logistic and Poisson regressions were used to investigate the effect of sexual identity (the reference category was non-LGBQ youth) on all mental health and substance use indicators (unconditional models). Logistic regressions were used for dichotomous variables, and Poisson regression models were used for count data (i.e., polysubstance use). We stratified analyses by sex and controlled for age and race/ethnicity. Next, for each model, we entered the hypothesized confounders of victimization, cybervictimization, and non-parental adult support (conditional models). We used decomposition analyses using the Karlson-Holm-Breen (KHB) method to compare regression coefficients between nested models and to assess the decomposition of confounding effects (Karlson & Holm, 2011). We listed the proportion of reduction in the effect of sexual identity coefficients across nested models caused by the confounders, as well as a *p* value for the reduction attributable to each confounder. Finally, we conducted a series of Wald chi-square tests of parameter constraints in MPlus 8 to test sex differences on all the direct and indirect beta coefficients in the regression models. A significant Wald chi-square indicates that the coefficients are not equal and that differences exist.

Results

Table 1 displays the weighted percentages, means, and standard errors of covariates, confounders, and outcome variables by sexual identity and sex. On average, sexual minority males reported the highest levels of victimization, followed by sexual minority females, heterosexual males, and heterosexual females. Sexual minority females reported significantly higher rates of cybervictimization than heterosexual females and males, and heterosexual males reported significantly lower rates of cybervictimization than heterosexual and sexual minority females. Sexual minority males did not differ from any other groups on rates of cybervictimization. Sexual minority males and females both reported significantly less non-parental adult support than heterosexual youth.

Overall, SMY reported significantly higher rates of sad feelings, suicidal thoughts, and suicidal attempts than heterosexual youth. Sexual minority females reported more marijuana use than heterosexual youth and sexual minority males reported more marijuana use than heterosexual females, but sexual minority males and females did not differ. Sexual minority males reported significantly more illicit drug use and polysubstance use than heterosexual youth, but did not differ from sexual minority females. Sexual minority females and heterosexual males reported similar rates of illicit drug use and

polysubstance use, with heterosexual females reporting lower rates of illicit drug use than sexual minority youth and lower rates of polysubstance use than all other groups.

Decomposition Analysis

We ran KHB regression models stratified by sex and adjusted for age and race/ethnicity to assess the associations of sexual identity on indicators of mental health (Table 2) and substance use (Table 3) and the confounding effects of victimization, cybervictimization and non-parental adult support. In the unconditional models, we observed significant sexual identity disparities in all indicators among males and females, except for binge drinking and marijuana use (see Table 3): sexual minority females were on average more likely to report binge drinking and marijuana use than heterosexual females, while no differences were found between sexual minority and heterosexual males. Wald chi-square difference tests showed that the direct association between sexual identity and mental health outcomes significantly differed across sex groups except for suicide attempts, and the direct association between sexual identity and substance use variables were equivalent across sex groups except for binge drinking.

The hypothesized confounding variables (i.e., victimization, cybervictimization, and non-parental adult support) were entered into the conditional models in order to assess the extent to which the association between sexual identity and the outcomes were accounted for by the three confounders. Considering that no differences were found between sexual minority and heterosexual males on binge drinking and marijuana use, we assessed the confounding influences on these outcomes only among females.

Victimization was significantly associated with all the indicators of mental health and substance use for both females and males. Cybervictimization and non-parental adult support were significantly associated with feeling sad and suicidal thoughts among males and females. Non-parental adult support was significantly associated with polysubstance use among males and females. Finally, cybervictimization was significantly associated with suicidal attempts only among females, and non-parental adult support was significantly associated with suicidal attempts only among males. Further analyses using a series of Wald tests to compare the direct associations of victimization, cybervictimization, and non-parental adult support on mental health and substance use across sex groups revealed no significant differences except for polysubstance use: The association between victimization and polysubstance use was stronger among males compared to females.

Decomposition analyses showed that victimization accounts for a significant proportion of the statistical association between sexual identity and all outcomes. Additionally, Wald tests comparing the indirect associations showed that

Table 2 Unconditional and conditional models testing the confounding effects of victimization, cybervictimization, and non-parental adult support in the association between sexual identity and mental health outcomes

	Females						Males						Sex differences		
	Unconditional Model			Conditional Model			Unconditional Model			Conditional Model			Direct Assoc.	Indirect Assoc.	
	<i>B</i>	<i>SE</i>	<i>OR</i>	<i>B</i>	<i>SE</i>	<i>OR</i>	% Reduction	<i>B</i>	<i>SE</i>	<i>OR</i>	<i>B</i>	<i>SE</i>	<i>OR</i>	Wald χ^2	Wald χ^2
Feeling Sad															
LGBQ	.86	.17	2.37***	.59	.19	1.81**		1.62	.38	5.08***	1.22	.36	3.40**	4.27*	
Victimization				.63	.12	1.88***	16.00%**				.60	.14	1.83***	0.80	2.51
Cybervictimization				.78	.13	2.19***	7.51%				.80	.23	2.22**	0.03	
Non-Parental Adult Support				-.13	.03	.88***	7.76%**				-.13	.04	0.88**	0.18	0.16
Suicidal Thoughts															
LGBQ	1.34	.22	3.80***	1.06	.22	2.89***		2.30	.31	9.92***	1.80	.29	6.03***	4.32*	
Victimization				.60	.11	1.82***	9.79%**				.65	.15	1.92***	0.38	3.23
Cybervictimization				.75	.21	2.13***	4.72%				1.05	.38	2.87**	2.13	
Non-Parental Adult Support				-.16	.07	0.85*	5.94%*				-.22	.06	0.80***	0.01	0.01
Suicidal Attempts															
LGBQ	.96	.22	2.62***	.76	.22	2.13***		1.60	.33	4.97***	1.24	.32	3.47***	2.44	
Victimization				.55	.18	1.73**	11.07%*				.50	.12	1.65***	1.09	1.14
Cybervictimization				.72	.23	2.05**	5.32%				.41	.33	1.51	0.60	
Non-Parental Adult Support				-.09	.06	0.91	4.99%				-.20	.07	0.82**	0.24	0.20

Note. *** $p < .001$; ** $p < .01$; * $p < .05$. % Reduction = percentage reduction in coefficients of LGBQ attributable to the confounder variable. N_{female} range = 926–1047 and N_{male} range = 753–885. Coefficients are adjusted by age, race and ethnicity. Wald Chi-square tests were employed by constraining each direct and indirect association of sexual identity and the confounders on the outcomes to be equal across females and males. A significant wald chi square indicates that beta coefficients are significantly different between females and males

Table 3 Unconditional and conditional models testing the confounding effects of victimization, cybervictimization, and non-parental adult support in the association between sexual identity and substance use

	Females						Males						Sex differences			
	Unconditional Model			Conditional Model			Unconditional Model			Conditional Model			Direct Assoc.	Indirect Assoc.		
	B	SE	OR	B	SE	OR	B	SE	OR	B	SE	OR	% Reduction	Wald χ^2	Wald χ^2	
Binge drinking																
LGBQ	.59	.30	1.81*	.48	.29	1.62	.48	.68	.48	-.73	.68	.48	-.98	.67	0.37	7.27**
Victimization				.37	.12	1.44**							.71	.14	2.03***	2.36
Cybervictimization				.37	.25	1.45							.63	.40	1.88	1.32
Non-Parental Adult Support				.00	-.05	1.00							.05	.07	1.06	0.51
Marijuana use																
LGBQ	1.01	.31	2.76**	.86	.29	2.35**	.44	.27	1.56	.19	.29	1.21	.19	.29	1.21	2.01
Victimization				.37	.07	1.45***				.59	.14	1.81***	.59	.14	1.81***	0.61
Cybervictimization				.15	.28	1.16				-.40	.28	0.67	-.40	.28	0.67	1.04
Non-Parental Adult Support				-.10	.07	0.90				-.03	.04	0.97	-.03	.04	0.97	1.22
Illicit drug use																
LGBQ	.97	.25	2.64***	.77	.24	2.16**	.93	.39	2.53*	.55	.38	1.74	.55	.38	1.74	0.14
Victimization				.52	.10	1.68***				.71	.11	2.04***	.71	.11	2.04***	6.61*
Cybervictimization				.36	.28	1.43				-.13	.39	0.88	-.13	.39	0.88	0.50
Non-Parental Adult Support				-.09	.06	0.91				-.11	.06	0.90	-.11	.06	0.90	0.06
Polysubstance use																
LGBQ	.79	.19	2.14***	.64	.19	1.89**	.58	.21	1.79**	.30	.22	1.33	.30	.22	1.33	0.02
Victimization				.36	.07	1.44***				.63	.09	1.87***	.63	.09	1.87***	3.57†
Cybervictimization				.13	.21	1.14				.03	.26	1.03	.03	.26	1.03	0.01
Non-Parental Adult Support				-.12	.05	1.13*				-.09	.03	1.10**	-.09	.03	1.10**	0.01

Note. ** $p < .001$; *** $p < .01$; * $p < .05$; † $p < .10$. % Reduction = percentage reduction in coefficients of LGBQ attributable to the confounder variable. N_{female} range = 948–1049 and N_{male} range = 796–891. Coefficients are adjusted by age, race and ethnicity. Wald Chi-square tests were employed by constraining each direct and indirect association of sexual identity and the confounders on the outcomes to be equal across females and males. A significant wald chi square indicates that beta coefficients are significantly different between females and males

compared to females, victimization among males accounted for a greater proportion of the association of sexual identity with illicit drug use and polysubstance use observed in the unconditional models (see Wald tests on indirect effects in Table 3). Among females, between 10.67% and 12.47% of the sexual identity coefficients in the unconditional models was attributed to victimization. Notably, the percentages were much higher among males: between 35.77% and 45.97%.

Overall, non-parental adult support accounted for a significant proportion of the sexual identity coefficient on feeling sad, suicidal thoughts and polysubstance use in the unconditional models for females. For males, non-parental adult support accounted for a significant proportion of the sexual identity coefficient on suicidal thoughts. Based on preliminary descriptive statistics showing no differences between sexual minority and heterosexual males on cybervictimization, we assessed the confounding percentage of cybervictimization only among females. However, cybervictimization did not significantly contribute to the association between sexual identity and any of the outcomes observed in the unconditional models.

Discussion

Using data from the first representative sample of Texas youth that includes measures of sexual minority identity, the current study extends the literature examining sexual identity-based disparities in behavioral risk by examining the confounding roles of victimization, cybervictimization, and non-parental adult support in the link between sexual minority identity and risk behaviors. Further, this study advances understandings of how risk- and health-promoting factors influence males and females differently.

Victimization

We found that victimization was strongly associated with mental health and substance use risk. These results mirror findings from a sizable literature demonstrating that experiencing victimization in adolescence places youth at risk for negative health outcomes (Hong et al., 2014; Swearer & Hymel, 2015). Consistent with the literature (Toomey & Russell, 2016), we also found that SMY, and males in particular, report more victimization than other groups. This greater vulnerability, which is likely due to discrimination and stigma associated with sexual minority status, is theorized as a main driver of poorer mental and physical health among SMY (Price-Feeney et al., 2018). The current study corroborates this hypothesis by showing that sexual identity disparities on mental health and substance use are contingent on victimization.

This study extends prior research by accounting for sex differences in the role of victimization on sexual identity

disparities in mental health and substance use. We found that victimization accounted for a greater proportion of the association between sexual minority identity and behavioral risk (i.e., illicit drug use, and polysubstance use) for male SMY than for female SMY. This finding is congruent with our descriptive results showing that sexual minority males reported greater victimization than sexual minority females, and indicates that victimization is a primary source of health disparities for male SMY. It is also consistent with a growing literature demonstrating gender differences in victimization experiences among SMY (Toomey & Russell, 2016). These differences may be linked to adolescent gender socialization mechanisms, whereby peers regulate gender through rewards for traditional gender role behaviors and punishment for non-traditional ones (Reigeluth & Addis, 2016). Overall, sexual minority males' violations of traditional gender norms may be more noticeable and likely to be punished compared to those of sexual minority females, placing sexual minority males at higher risk for peer punishment in the form of victimization (Reigeluth & Addis, 2016). For example, one recent study found that among sexual minority youth, gender nonconformity was more likely to be associated with homophobic name-calling for boys than for girls (Lisdonk et al., 2015). This trend may be especially strong in Texas, where dominant cultural norms and values have been rooted in traditional masculinity (Molina II, 2014; Sáenz et al., 2013). Attitudes regarding traditional masculinity are strongly linked to homophobic attitudes and behaviors (Whitley, 2001), and prior studies have found that male students report more homophobic bullying perpetration and victimization than females (Birkett & Espelage, 2015). In line with prior research, our results suggest that victimization is a critical issue that needs to be considered when exploring mental and physical health disparities among SMY, particularly for males.

Cybervictimization

This study contributes to a growing literature regarding the prevalence of cybervictimization at the intersection of sex and sexual identity. We found that females in the current study reported more cybervictimization than heterosexual males. Further, sexual minority females were more likely to report cybervictimization than heterosexual males and females, whereas sexual minority males did not significantly differ from other youth. The disproportionate risk of cybervictimization among females, particularly among sexual minority females, is consistent with prior research demonstrating higher rates of cybervictimization among sexual minority than heterosexual youth (Abreu & Kenny, 2018; Schneider et al., 2012) and higher rates among females than males (Sun & Fan, 2018; Wang et al., 2009). Further, our results corroborate prior findings describing sexual minority females as disproportionately burdened by cybervictimization

(Hinduja & Patchin, 2020; Rice et al., 2015), and diverge from other studies which have found that both male and female SMY report greater cybervictimization than heterosexual youth (DeSmet et al., 2018; Priebe & Svedin, 2012). Inconsistency in the measurement of cybervictimization may contribute to these divergent findings. Some studies assess the venues at which cybervictimization occurs (DeSmet et al., 2018; Priebe & Svedin, 2012), while others measure the frequency of electronic harassment (Kessel Schneider et al., 2015). Our measure examined broad reports of presence or absence of electronic bullying in the past 12 months. More research with consistent measurement of cybervictimization is needed to better understand cybervictimization experiences among SMY, and its variability across the intersection of sex, sexual identity, and other social identities.

Notably, experiences of cybervictimization were associated with mental health risk but not with substance use. Previous findings on the relation between cybervictimization, mental health, and substance use are mixed, possibly due to inconsistent measures of cybervictimization. For example, Sinclair et al. (2012) found that harassment online or in text messaging in the past 12 months was associated with both mental health and substance use. Díaz and Fite (2019) used a scale to measure the frequency of cybervictimization experiences since the beginning of the academic year and reported associations only with substance use. Accordingly, it is possible that the risk for substance use is specific to the frequency and the different methods of cybervictimization (i.e., text messaging, picture sharing) and not to the experience of electronic harassment as a whole.

Contrary to findings for victimization and non-parental adult support, analyses showed no confounding effects when cybervictimization was included in the model. This result was unexpected, given that a recent study (Luk et al., 2018) found that cybervictimization significantly mediated the association between sexual identity and depressive symptoms. A possible methodological explanation is that previous findings were based on a measure of the frequency of cybervictimization over the past two months, whereas our study focuses on the presence of experienced cybervictimization. It may be relevant to distinguish between presence and frequency of cybervictimization experiences when examining sexual identity disparities.

Non-parental Adult Support

Similar to prior research (Eisenberg & Resnick, 2006; Stone et al., 2015), our study showed that SMY reported fewer non-parental supportive adults relative to heterosexual youth, and that the availability of non-parental supportive adults was associated with reduced mental health risk and polysubstance use. These results are consistent with an extensive literature documenting the strong association between social support

and adolescent psychological well-being (Brausch & Decker, 2014; Watson et al., 2019). Contrary to prior evidence (Culyba et al., 2016; De Pedro et al., 2017; Seil et al., 2014), we found that non-parental adult support was not associated with less marijuana use, binge drinking, and illicit drug use. However, our findings corroborated prior research using composite indices of substance use (Darwich et al., 2012; LaRusso et al., 2008) by showing that greater access to non-parental supportive adults was associated with less polysubstance use. It may be more difficult to hide polysubstance use from supportive adults as compared to single substance use, particularly if youth are surrounded by multiple supportive adults. Prior research has demonstrated that youth are less likely to engage in polysubstance use when they receive support from adults at school and from family members (Zuckermann et al., 2020).

Finally, the present study makes an important contribution to understandings of sexual minority disparities at the intersection of sex by showing confounding effects of non-parental adult support on the association of sexual identity on feeling sad, suicidal thoughts, and polysubstance use for females, and on suicidal thoughts for males. These results suggest that intervention efforts aimed at reducing disparities in psychological and behavioral risk among SMY and their heterosexual peers should focus on building a network of non-parental supportive adults on which SMY can rely in times of need.

Limitations and Future Directions

Several limitations to our study warrant the need for continued research. First, although the geographical scope of the study is novel in that it focuses on SMY in geographical regions that are historically less politically progressive than those utilized in other studies, findings should be interpreted as specific to the Texas context and may not be comparable to other studies utilizing YRBS data from different states or regions. Relatedly, the construction of the victimization variable in the current study diverges from prior research, as the 2017 Texas YRBS included different victimization items relative to previous studies (Rosario et al., 2014; Russell et al., 2014). This limits the comparability of our findings with prior studies. Further, as is common with studies that use large, representative datasets (e.g., Seil et al., 2014), the Texas YRBS contained single-item measures of cybervictimization and non-parental adult support. The current study's cybervictimization measure captures the occurrence of electronic bullying in the past year. However, additional items measuring the frequency, source, and severity of the cybervictimization would increase the reliability and comparability of our findings (Abreu & Kenny, 2018). Similarly, although several prior studies have also employed single-item measures of non-parental adult support (Rueger et al., 2008; Seelman et al., 2012, 2015; Seil et al., 2014), future

research should include more robust measures of non-parental adult support that capture the source, quality, and frequency of support (De Pedro et al., 2017) in order to improve the validity of findings.

The use of an omnibus variable measuring sexual minority identity obscures potential within-group variability (e.g., bisexual vs. lesbian vs. gay identities). Further, the Texas YRBS did not measure gender identity, therefore we were unable to measure subgroup differences across youth with cisgender, transgender, and other gender identities. Given that subgroup differences in mental and behavioral risk across subgroups of sexual minority and gender minority youth are well established (Li et al., 2016; Toomey et al., 2018), future research should prioritize understanding risk and protective factors for health in the context of youth's diverse identities and experiences. Perhaps consistent with pressures of traditional masculinity, there was a disproportionate number of female compared to male youth in the sexual minority subsample. Although this finding is not uncommon in samples of sexual minority youth (e.g., De Pedro et al., 2017; Price-Feeney et al., 2018), research with larger samples of sexual minority male youth may yield the statistical power for additional analysis. Finally, our study relies on cross-sectional data, precluding the ability to determine the directionality of associations.

Conclusion

We present one of the first studies of SMY using a probability sample from the state of Texas, and the first to focus on mental health and substance use. Most prior population-based studies of SMY have been conducted in states with more supportive policy contexts (e.g. Minnesota, California, Massachusetts). Texas is home to nearly one in ten youth in the United States and has historically been unsupportive of policies that support or affirm SMY. Our findings are consistent with those from other states that underscore the critical role of minority stressors such as victimization in the lives of SMY across diverse sociopolitical climates. As such, the implications for practice generalize to SMY in secondary schools both within and beyond Texas.

Our study adds to extant evidence that victimization and a dearth in availability of non-parental adult support drives SMY's increased vulnerability to poor mental health and substance use. Schools should implement inclusive, enumerated policies that explicitly prohibit bullying based on sexual minority identity. In addition, empowering adults with the tools to support SMY through professional development and access to LGBTQ-related resources could provide a critical buffer of behavioral health risk. Future research should bolster information about the ways that subgroups of SMY's experiences are distinct in order to develop culturally-sensitive and context-

specific practices that promote thriving for sexual minority, and all, youth.

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Data Availability The data that support the findings of this study are available upon request from the Texas Department of State Health Services, <https://dshs.texas.gov/chs/yrbs>.

Declarations

Conflict of Interest The authors do not have any conflicts of interest to report.

Compliance with Ethical Standards The publicly available and non-identifiable secondary data used in this research was determined to be non-human subjects research, consistent with institutional IRB standards.

Informed Consent Information regarding the informed consent process for the data that support the findings of this study are available from <https://dshs.texas.gov/chs/yrbs>.

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