



Self-Injurious Thoughts and Behaviors Among Sexual and Gender Minority Youth: a Systematic Review of Recent Research

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Abstract

Purpose of Review Research has demonstrated that sexual and gender minority youth are at elevated risk for self-injurious thoughts and behaviors (SITBs). This systematic review aimed to synthesize and critically examine research published within the last 5 years, with a particular emphasis on (1) prevalence rates; (2) disparities over time; and (3) individual- and macro-level risk and protective factors contributing to risk for SITBs within this population.

Recent Findings Overall, 97 peer-reviewed articles, published since 2015, were identified for inclusion. Across studies, rates of SITBs among sexual and gender minority youth were substantially elevated compared to heterosexual and/or cisgender youth and the general population. Studies identified several common risk factors, including bullying and other forms of victimization, minority-specific discrimination and harassment, and general mental health factors, as well as several common protective factors, including support from close others, school-based programs, and statewide policies.

Summary Further research is needed in numerous domains, including the examination of identity-specific factors in large, representative samples, additional protective factors, disparities across subgroups of LGBTQ youth, and intersectionality, as well as the use of longitudinal designs and randomized controlled trials examining interventions in this population. Critical areas for further research on SITBs among this high-risk population are discussed.

Keywords Self-injury · Suicide · Sexual minority · Gender minority · LGBTQ

Suicide is the second-leading cause of death among children and adolescents aged 10 to 24 years in the USA [1, 2]. Results from the Centers for Disease Control and Prevention's 2017 National Youth Risk Behavior Surveillance Survey (YRBSS) indicated that 17.2% of high school students seriously considered attempting suicide, 13.6% made a suicide plan, and 7.4% actually attempted suicide within the past year [3]. Likewise, approximately 18% of adolescents report engaging in non-suicidal self-injury (NSSI) [4], which is especially noteworthy

in the context of accumulating evidence that NSSI increases risk for subsequent suicidal behaviors [5, 6]. Accordingly, understanding self-injurious thoughts and behaviors (SITBs) among youth represents a significant public health priority.

Certain subpopulations exhibit increased prevalence of SITBs. In particular, sexual and gender minority populations, among both youth and adults, have been identified as groups with significantly elevated risk for SITBs [7, 8]. According to data from the 2017 YRBSS, rates of past-year suicidal ideation (lesbian, gay, or bisexual [LGB]: 47.7%, heterosexual: 13.3%), suicide plans (LGB: 38.0%, heterosexual: 10.4%), and suicide attempts (LGB: 23.0%, heterosexual: 5.4%) were approximately 3.5 to 5.0 times higher among sexual minority high school students than among heterosexual students [3]. Similarly, compared to cisgender students, students identifying as transgender and non-binary (TNB) were 3.7 to 6.3 times more likely to report past-year suicidal ideation (TNB: 43.9%; cisgender boy: 11.0%; cisgender girl: 20.3%), suicide plans (TNB: 39.3%; cisgender boy: 10.4%; cisgender girl: 16.0%), and suicide attempts (TNB: 34.6%; cisgender boy: 5.5%; cisgender girl: 9.1%) [9].

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In response to these elevated rates, numerous studies have been conducted to better understand SITBs among children and adolescents who identify as sexual and/or gender minorities. These studies have ranged in their scope and focus, with some aimed at identifying overall rates through epidemiological research and national surveys, and others aimed at examining potential psychological, interpersonal, and societal mechanisms underlying increased rates of SITBs among LGBTQ+ youth. Given the importance of understanding SITBs among sexual and gender minority youth, as well as developing and implementing effective interventions and policies that serve to decrease SITBs within this population, we synthesized and reviewed recent published work (i.e., past 5 years) in this area. Namely, this review aimed to outline and critically examine (1) rates of SITBs among sexual and gender minority youth and (2) individual and societal risk and protective factors influencing risk of SITBs in these populations, as well as (3) discuss current gaps in the literature and highlight areas in need of future research.

We conducted a comprehensive, systematic search for published articles on April 20, 2020, via two leading databases: PsycINFO and PubMed. To gather and synthesize the most up-to-date literature, only articles published since 2015 were identified for potential inclusion. Search term permutations included any combination of the following: *LGB**, *sexual minor**, *gender minor**, *gay*, *lesbian*, *bisexual*, or *trans** to identify sexual and gender minorities, combined with *suicid**, *self-harm*, *self-inj**, *SITB*, or *NSSI* to gather articles related to SITBs, and *youth*, *adolescen**, or *child** to identify articles examining these constructs in individuals aged 18 or younger. Reference sections of relevant articles were also examined for further sources. A total of 614 unique published reports were identified. Titles, abstracts, and full texts of these 614 articles were reviewed by the authors to determine eligibility for inclusion, resulting in a total of 97 articles (see Fig. 1 for details on the study selection process). Inclusion criteria required that studies (1) were original, empirical articles (i.e., not theoretical reports, systematic reviews, or meta-analyses), (2) were written in English, (3) were published in 2015 or later, (4) included individuals aged 18 years or younger and who identified as sexual and/or gender minorities, and (5) presented quantitative data examining SITBs in this population (see Table 1 for a summary of articles included within the review).

Results from the Systematic Review

Overview of Study Characteristics

The vast majority of studies ($k = 78$) were epidemiological in nature/design (e.g., national representative surveys, state/province-based surveys). Additionally, eight studies involved community-based recruitment and data

collection, five examined pediatric patients, four were birth cohort studies, one included students enrolled in a randomized controlled trial, and one involved the review of electronic medical records. Over a third of studies ($k = 37$) used various configurations of the YRBSS. The other most common data sources included original data collection ($k = 17$) and the Minnesota Student Survey ($k = 7$). Most studies were cross-sectional ($k = 92$). Of the five longitudinal studies, lengths of follow-up included 6 months ($k = 1$), 6 years ($k = 2$), and 13–14 years ($k = 2$). Studies were primarily conducted in the USA ($k = 70$), followed by China ($k = 6$), Canada and the UK ($k = 4$), South Korea ($k = 3$), Australia ($k = 2$), and Iceland, Mexico, New Zealand, and the Philippines ($k = 1$). There was significant overlap of data use in the US samples (primarily due to multiple uses of various combinations of YRBSS data), precluding calculation of a number of unique participants included in the review.

Prevalence Rates of SITBs Among Sexual and Gender Minority Youth

Nearly four-fifths ($k = 77$; 78%) of studies identified in the review provided information on prevalence rates of SITBs among sexual ($k = 59$) and/or gender ($k = 19$) minority youth. Detailed findings for each outcome are presented below.

Sexual Minority Youth

Suicidal Ideation In comparison to heterosexual youth, sexual minority youth had higher rates of current [10], past-week [11], past-month [12], past-year [13–41], and lifetime [42–47] suicidal ideation. In contrast, Peters and colleagues [11] found no lifetime differences in suicidal ideation by sexual minority status. Estimates indicated that 31.0% to 46.2% of sexual minority youth (in comparison to approximately 13.3% of heterosexual youth [3]) experienced past-year suicidal ideation [17, 19, 22, 24, 31, 37, 40, 41, 48–52], with bisexual youth at highest risk [19, 20, 37, 53], and LGB youth at higher risk than those who were questioning/unsure of their sexual orientation [36, 40].

Suicide Plans Prevalence rates of sexual minority youth reporting past-year suicide plans ranged from 24.3 to 39.3% [17, 19, 22, 31, 37, 40, 48, 49, 51], with sexual minority youth exhibiting significantly higher rates (i.e., approximately 2.34× to 3.78× higher; [3]) of past-year suicide plans than heterosexual youth [15–17, 19, 22, 25–29, 31, 33, 36–38, 40, 54]. Two studies found higher rates of lifetime suicide plans among sexual minority youth compared to heterosexual youth [43, 46]. However, one study found no association between sexual orientation and suicide plans [55]. Bisexual youth

Table 1 Summary of articles included in review

Authors	N	Sample type	Study design	Minority focus	Outcome type	Variable type
Agnew-Brune et al. (2019)	547	Community-based	Cross-sectional	Sexual	SI SA	Individual risk/protective
Amos et al. (2019)	9885	Cohort study	Cross-sectional	Sexual	NSSI	Prevalence
Annor et al. (2018)	6790	National survey	Cross-sectional	Sexual	SR	Individual risk/protective
Amarsson et al. (2015)	3813	National survey	Cross-sectional	Sexual	SI	Prevalence
Baiden et al. (2020)	13,697	National survey	Cross-sectional	Sexual	SA	Individual risk/protective
Ballard et al. (2017)	1550	National survey	Cross-sectional	Sexual	SI	Prevalence
Barnett et al. (2019)	10,593	National survey	Cross-sectional	Sexual	SA	Intersectionality
Becerra-Culqui et al. (2018)	1333	Electronic medical record review	Cross-sectional	Gender	SR	Prevalence
Blashill and Calzo (2018)	4519	National survey	Cross-sectional	Sexual	SI	Individual risk/protective
Bouris et al. (2016)	1907	National survey	Cross-sectional	Sexual	SP	Prevalence
Boyas et al. (2019)	451	National survey	Cross-sectional	Sexual	SA	Individual risk/protective
Burk et al. (2018)	21,075	Province survey	Cross-sectional	Sexual	SI	Prevalence
Butler et al. (2019)	8440	School survey	Cross-sectional	Gender	SA	Individual risk/protective
Button (2015)	2649	National survey	Cross-sectional	Sexual	NSSI thoughts	Macro risk/protective
Button (2016)	484	National survey	Cross-sectional	Sexual	SR	Prevalence
Caputi et al. (2017)	15,624	National survey	Cross-sectional	Sexual	SI	Individual risk/protective
Clementis-Nolle et al. (2018)	4955	National survey	Cross-sectional	Sexual	SP	Prevalence
Coulter et al. (2017)	22,834	School survey	Cross-sectional	Sexual	SA	Individual risk/protective
Cutuli et al. (2019)	77,559	National survey	Cross-sectional	Sexual	SI	Prevalence
DeCamp and Bakken (2016)	7326	National survey	Cross-sectional	Sexual	SA	Intersectionality
DeCou and Lynch (2018)	550	Psychiatric inpatient	Cross-sectional	Sexual	SI	Prevalence
Duarte et al. (2018)	1031	Pediatric emergency department	Cross-sectional	Sexual	NSSI	Individual risk/protective
Dunn et al. (2015)	9300	National survey	Cross-sectional	Sexual	SA	Prevalence
Eisenberg et al. (2015)	39,493	State survey	Cross-sectional	Sexual	SI	Individual risk/protective
					SA	Prevalence
					NSSI	Individual risk/protective

Table 1 (continued)

Authors	N	Sample type	Study design	Minority focus	Outcome type	Variable type
Eisenberg et al. (2017)	80,929	State survey	Cross-sectional	Gender	SI SA NSSI	Prevalence
Eisenberg et al. (2016)	122,180	State survey	Cross-sectional	Sexual	SI SA NSSI	Individual risk/protective Macro risk/protective
Espelage et al. (2016)	11,794	County survey	Cross-sectional	Gender Sexual	SI SA	Prevalence Individual risk/protective Macro risk/protective
Feinstein et al. (2019)	18,515	National survey	Cross-sectional	Sexual	SI	Prevalence Intersectionality
Fish and Pasley (2015)	12,679	National survey	Longitudinal	Sexual	SI SA	Prevalence Intersectionality
Fox et al. (2020)	2948	Community-based	Cross-sectional	Gender Sexual	SI SA NSSI	Prevalence Intersectionality
Fraser et al. (2017)	1799	National survey	Cross-sectional	Sexual	NSSI	Prevalence Individual risk/protective
Gattamorta et al. (2019)	5852	National survey	Cross-sectional	Sexual	SI SP SA	Prevalence Intersectionality
Goldbach et al. (2017)	346	Community-based	Cross-sectional	Sexual	SI SA NSSI	Individual risk/protective Macro risk/protective
Goodin et al. (2019)	2577	National survey	Cross-sectional	Sexual	SI SP SA NSSI	Prevalence
Gower et al. (2018)	2168	School survey	Cross-sectional	Gender	SI SA	Prevalence Individual risk/protective Macro risk/protective
Hatchel et al. (2019)	713	RCT Baseline	Cross-sectional	Combined	SI SA	Prevalence Individual risk/protective
Hatchel et al. (2018a)	934	County survey	Cross-sectional	Combined	SI SA	Prevalence Individual risk/protective
Hatchel et al. (2018b)	4778	State survey	Cross-sectional	Gender	SI	Prevalence Intersectionality
Higgins Tejera et al. (2019)	10,386	State survey	Cross-sectional	Sexual	SI	Intersectionality
Hirschtritt et al. (2018)	423	Cohort study	Cross-sectional	Sexual	NSSI	Prevalence
Huang et al. (2018a)	150,822	National survey	Cross-sectional	Sexual	SI SA	Prevalence
Huang et al. (2018b)	123,459	National survey	Cross-sectional	Sexual	SI SA	Individual risk/protective
Huang et al. (2018c)	123,459	National survey	Cross-sectional	Sexual	SI	Prevalence Individual risk/protective
Huang et al. (2018d)	72,409	National survey	Cross-sectional	Sexual	SA	Prevalence Individual risk/protective

Table 1 (continued)

Authors	N	Sample type	Study design	Minority focus	Outcome type	Variable type
Ioerger et al. (2015)	2438	School survey	Cross-sectional	Sexual	SI SP SA	Individual risk/protective
Irish et al. (2018)	4828	Cohort study	Longitudinal	Sexual	NSSI	Prevalence
Jackman et al. (2019)	17,853	National survey	Cross-sectional	Gender	SI SA	Prevalence
Jiang et al. (2018)	14,264	National survey	Cross-sectional	Sexual	SI SP SA	Prevalence
Johns et al. (2019)	131,901	National survey	Cross-sectional	Gender	SI SP SA	Prevalence
Johns et al. (2017)	7006	National survey	Cross-sectional	Sexual	SI SP SA	Prevalence Individual risk/protective
Johns et al. (2018)	30,389	National survey	Cross-sectional	Sexual	SI SP SA	Prevalence
Katz-Wise et al. (2018)	33	Community-based	Cross-sectional	Gender	SI SP SA	Prevalence Individual risk/protective
Kim et al. (2016)	146,621	National survey	Cross-sectional	Sexual	SI SP SA NSSI	Prevalence Individual risk/protective
Kwak and Kim (2017)	3603	National survey	Cross-sectional	Sexual	SI SP SA	Prevalence
Lardier Jr. et al. (2017)	538	School survey	Cross-sectional	Sexual	SI	Individual risk/protective
Lee et al. (2016)	129,900	National survey	Cross-sectional	Sexual	SI SA	Prevalence
Li et al. (2019)	1810	National survey	Cross-sectional	Sexual	NSSI	Prevalence Individual risk/protective
Liu (2019)	21,213	National survey	Cross-sectional	Sexual	NSSI	Prevalence
Liu et al. (2020)	41,636	National survey	Cross-sectional	Sexual	SI SP SA	Prevalence Disparities over time
Lowry et al. (2017)	15,624	National survey	Cross-sectional	Sexual	SI SA	Prevalence Individual risk/protective
Mendoza-Pérez and Ortiz-Hernández (2018)	23,496	National survey	Cross-sectional	Sexual	SI SA	Prevalence Individual risk/protective
Mereish et al. (2019)	1129	State survey	Cross-sectional	Sexual	SI SA	Prevalence Individual risk/protective
Monto et al. (2018)	64,671	National survey	Cross-sectional	Sexual	SP	Prevalence Individual risk/protective
Moyer et al. (2018)	194	Pediatric endocrinology clinic	Cross-sectional	Gender	NSSI	Prevalence
Mueller et al. (2015)	75,344	National survey	Cross-sectional	Sexual	SI	Prevalence Intersectionality

Table 1 (continued)

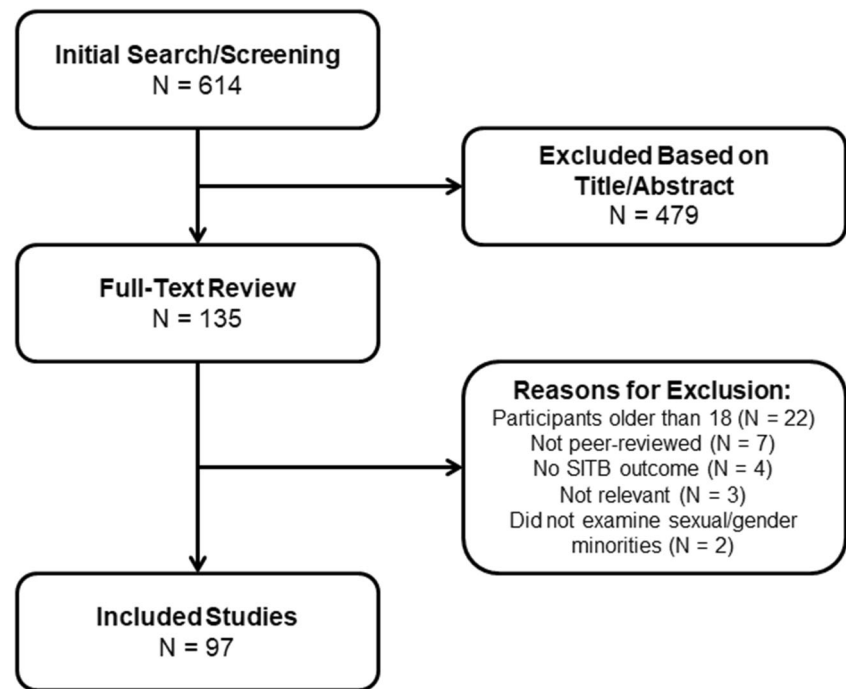
Authors	N	Sample type	Study design	Minority focus	Outcome type	Variable type
Nahata et al. (2017)	79	Pediatric endocrinology clinic	Cross-sectional	Gender	SI SA NSSI	Prevalence
Oginni et al. (2018)	4274	Cohort study	Longitudinal	Sexual	SI NSSI	Prevalence Individual risk/protective Individual risk/protective
Paul and Monahan (2019)	648	National survey	Longitudinal	Sexual	SI SA	Prevalence Individual risk/protective Prevalence
Peng et al. (2019)	385	Community-based	Cross-sectional	Gender	SI SA	Prevalence Individual risk/protective Prevalence
Perales and Campbell (2019)	3318	Cohort study	Cross-sectional	Sexual	SI SP SA NSSI thoughts NSSI	Prevalence Individual risk/protective Disparities over time
Perez-Brumer et al. (2017)	650,045	State survey	Cross-sectional	Gender	SI	Prevalence Individual risk/protective Disparities over time
Peter et al. (2017)	99,347	Province survey	Cross-sectional	Sexual	SI SA	Prevalence Individual risk/protective
Peters et al. (2019)	52	Psychiatric inpatients	Cross-sectional	Sexual	SI SA NSSI	Disparities over time
Porta et al. (2018)	36,782	State survey	Cross-sectional	Sexual	SI SA	Prevalence Macro risk/protective Disparities over time
Proulx et al. (2019)	47,730	National survey	Cross-sectional	Sexual	SI SP SA	Prevalence Macro risk/protective Disparities over time
Raifman et al. (2020)	156,891	National survey	Cross-sectional	Sexual	SI SA	Prevalence Macro risk/protective Disparities over time
Raifman et al. (2017)	762,678	National survey	Cross-sectional	Sexual	SI SA	Prevalence Macro risk/protective Individual risk/protective
Reyes et al. (2015)	340	School survey	Cross-sectional	Sexual	SI	Prevalence Individual risk/protective
Richardson et al. (2020)	3151	National survey	Cross-sectional	Sexual	SI SP SA	Prevalence Individual risk/protective
Roberts et al. (2018)	531	School survey	Cross-sectional	Sexual	SR	Prevalence
Romanelli et al. (2020)	5153	National survey	Cross-sectional	Sexual	SI SP SA	Prevalence
Ross-Reed et al. (2019)	18,451	State survey	Cross-sectional	Gender	SI SA	Prevalence Individual risk/protective Macro risk/protective
Seelman and Walker (2018)	286,568	National survey	Cross-sectional	Sexual	SI SA	Individual risk/protective Individual risk/protective
Smith et al. (2020)	252	Community-based	Longitudinal	Combined	SI SP SA NSSI	Individual risk/protective
Taliaferro and Muehlenkamp (2017)	77,758	State survey	Cross-sectional	Sexual	SI SA NSSI	Prevalence Individual risk/protective

Table 1 (continued)

Authors	N	Sample type	Study design	Minority focus	Outcome type	Variable type
Taliaferro et al. (2017)	922	National survey	Cross-sectional	Sexual	SA	Individual risk/protective
Taliaferro et al. (2018)	2168	State survey	Cross-sectional	Gender	NSSI	Prevalence
Thoma et al. (2019)	2020	Community-based	Cross-sectional	Gender	SI SP SA NSSI	Individual risk/protective Prevalence
Toomey et al. (2018)	116,925	National survey	Cross-sectional	Gender	SA	Prevalence
Turpin et al. (2020a)	849	National survey	Cross-sectional	Sexual	SA	Intersectionality Prevalence
Turpin et al. (2020b)	3357	National survey	Cross-sectional	Sexual	SI SP SA	Intersectionality Prevalence
Turpin et al. (2019)	924	National survey	Cross-sectional	Sexual	SP	Individual risk/protective
Veale et al. (2017)	839	Community-based	Cross-sectional	Gender	SI SA NSSI	Prevalence Individual risk/protective Prevalence
Watson et al. (2018)	99,373	Province survey	Cross-sectional	Sexual	NSSI	Prevalence
Whitaker et al. (2016)	356	State survey	Cross-sectional	Sexual	NSSI	Disparities over time Prevalence
Zaza et al. (2016)	15,624	National survey	Cross-sectional	Sexual	SI	Individual risk/protective Prevalence
Zhang et al. (2018)	13,608	State survey	Cross-sectional	Sexual	SI SP SA SA	Prevalence Macro risk/protective

Note: SI, suicidal ideation; SP, suicide plans; SR, suicide risk; SA, suicide attempts; NSSI, non-suicidal self-injury

Fig. 1 Flowchart describing the study selection process



had higher rates of suicide planning than lesbian/gay youth [19, 37], and LGB youth had higher rates than questioning/unsure youth [36, 40].

Suicide Attempts Estimates from 11 studies indicated that 10.2% to 29.6% of sexual minority youth reported a past-year suicide attempt [17, 19, 22, 24, 31, 40, 41, 48, 49, 51, 56]. Sexual minority youth had significant higher odds (i.e., 1.88× to 5.48× higher; [3]) of reporting a suicide attempt within the past year than their heterosexual counterparts (5.4%; [3]) [9, 13–26, 28–32, 36, 38–41, 53, 54, 57]. Additionally, youth who identified as bisexual exhibited higher suicide attempt rates than lesbian/gay youth in three studies [20, 23, 29], and LGB youth had higher rates than questioning/unsure youth in two studies [36, 40].

Findings were similar across the lifetime. Approximately 29.5% of sexual minority youth reported a lifetime history of suicide attempts [58]. In the vast majority of studies, sexual minority youth had higher rates of suicide attempts (1.92× to 4.21× higher) than their heterosexual peers [12, 42, 43, 45, 46, 59]. In contrast, one study found no differences in suicide attempt history by sexual minority status [11]. Finally, one study found that pediatric inpatients who identified as sexual minorities were more likely to report a suicide attempt at hospital admission than inpatients who did not identify as sexual minorities [60].

NSSI Youth who identify as sexual minorities reported higher rates of NSSI within the past year [20, 35, 36, 39, 61–65] and across the lifespan [11, 22, 44, 45, 66–68] than heterosexual youth. Estimates specifically suggested that sexual minority

youth are 2.25 to 5.80 times more likely to report NSSI than their heterosexual peers [22, 44, 45, 61–64, 66–68]. Moreover, one study indicated that bisexual youth have significantly elevated rates of NSSI (6 to 8 times higher), compared to lesbian/gay and heterosexual youth [20].

Gender Minority Youth

Suicidal Ideation TNB youth had higher rates of suicidal ideation within the past month [12], past 6 months [69], past year [9, 70–73], and across the lifetime [45, 69, 74] than cisgender youth. Rates varied by timeframe: 29.7% of TNB youth reported suicidal ideation within the past 2 weeks, with rates significantly elevated for non-binary youth (63.6%), compared to transgender girls (27.7%) or transgender boys (27.6%). In contrast, rates ranged from 30.0 to 65.0% within the past year [72, 73, 75–77] and from 50.9 to 74.7% across the lifetime [78, 79]. One study found higher rates among those assigned female at birth (AFAB) than those assigned male at birth (AMAB; Eisenberg et al., 2017). However, another study found higher rates among transgender girls than transgender boys [79], whereas yet another found no differences across gender minority identities [78].

Suicide Plans Three studies provided evidence that TNB youth had higher rates of suicide plans in the past year (20.0% to 45.8%) [9, 72] and across the lifetime (1.82× higher) [74] than cisgender youth (9.4% to 16.8%).

Suicide Attempts Rates of suicide attempts within the past year were higher among TNB youth compared to cisgender

youth [9, 70–72, 80], with suicide attempt rates for TNB youth ranging from 15.0 to 36.1% [72, 75, 77, 80], compared to 4.9% to 10.1% for cisgender youth [9]. One study [70] found that youth AFAB had higher rates of past-year suicide attempts than those AMAB. Similarly, TNB youth reported higher rates of suicide attempts across the lifespan than cisgender youth [12, 45, 74]; rates for TNB youth in these studies ranged from 15.8 to 30.4% [78, 79] and were 1.65× higher than among cisgender youth [74]. One study found no disparities across gender minority identities [78], although another study found interactions between gender identity and sexual orientation among all youth, such that rates of suicide attempts were especially elevated for transgender girls who also identified as mostly/totally gay/lesbian, and rates were especially elevated for all transgender boys who identified as a sexual minority [59].

NSSI One study examining thoughts/urges for NSSI indicated that transgender youth had the highest rates of thoughts of NSSI (34.5%), followed by gender non-conforming (10.0%), cisgender girl (2.3%), and cisgender boy (0.7%) youth [81]. With regard to engagement in NSSI, approximately half of TNB youth reported NSSI in the past year (49.0–54.8%; Katz-Wise et al., 2018; Ross-Reed et al., 2019; Taliaferro, McMorris, et al., 2018), with 40.3% reporting repetitive (i.e., 10+ times) NSSI within the past year [82], and approximately 55.7% reporting lifetime NSSI [78]. Rates were higher among TNB youth than among cisgender youth in the past 6 months [69], past year [70, 72, 80], and lifetime [45, 69, 74]. Disparities across gender identities were found in two studies—rates were higher among those AFAB, transgender boys, and non-binary individuals [70, 77] than among other gender minority identities—but one study found no differences in rates by gender minority identities [78].

Disparities and Changes in Rates Over Time

Given shifts in cultural attitudes resulting in increased acceptance toward sexual and gender minority individuals [83, 84], disparities in rates of SITBs between sexual/gender minority and heterosexual/cisgender youth may diminish over time. Five studies [31, 56, 65, 85, 86] addressed this research question by examining trends in rates of SITBs among sexual minority youth over time in comparison to heterosexual youth. Across all samples examining suicide-related outcomes, few existing disparities changed over time. Results from the Minnesota Student Survey indicated that, although the gap in lifetime suicidal ideation narrowed between bisexual and heterosexual boys from 2004 to 2010, there were no other changes in rates over time between groups from 1998 to 2010 [86]. Rather, prevalence rates of past-year suicidal ideation, plans, and attempts, as assessed by the Massachusetts Youth Risk Behavior Survey, declined from 1995 and 2017

for both sexual minority and heterosexual youth, though this decrease plateaued in 2007 among heterosexual youth [31]. Another study found decreases in suicide attempt rates among sexual minority youth from 2009 to 2017; however, given the overall increase in youth identifying as sexual minorities, sexual minority adolescents accounted for an increasing proportion of all adolescent suicide attempts during this time period [56]. In contrast, results of the British Columbia Adolescent Health Survey indicated that rates of suicidal ideation among bisexual and lesbian girls increased from 1998 and 2013, and that the gap in the disparity of suicidal ideation between bisexual and heterosexual girls widened during this timeframe [85].

Only one of these studies examined trends in NSSI over time [65]. Namely, rates of past-year NSSI were significantly elevated for bisexual and gay/lesbian youth during the entire study period (i.e., 1998 to 2013), compared to mostly heterosexual and completely heterosexual youth. Although the gap in rates of self-injury narrowed between gay and heterosexual boys from 2008 to 2013, there were no other changes in disparities of NSSI over time between sexual minority and heterosexual youth. Altogether, these findings suggest that, with few exceptions, disparities in rates of SITBs among sexual minority and heterosexual youth have remained largely unchanged over the past 15 years.

No studies to date have examined changes in disparities of SITBs over time between gender minority and cisgender youth, representing a gap in the extant literature.

Intersectionality with Other Sociodemographic Characteristics

Ten studies identified in this review examined the intersection between sexual orientation or gender identity and other sociodemographic characteristics that may jointly increase risk for SITBs among youth. Of these, eight studies investigated the role of race/ethnicity, one examined the role of disability status, and one examined homelessness as a contributing factor. Findings regarding race/ethnicity were mixed. Several studies found few, if any, significant interactions between race/ethnicity and sexual orientation/gender identity [34, 50, 76], suggesting that differences in risk across races/ethnicities for sexual and gender minority youth may be minimal. However, other studies found that Black gender minority and sexual minority youth were less likely to report NSSI [45], and that Black sexual minority—particularly bisexual—youth were less likely to report suicidal ideation [45, 50, 87] and suicide attempts [45] than White or Hispanic sexual minority youth. Hispanic gay/lesbian/bisexual and American Indian/Native American bisexual/questioning youth had increased odds of reporting a suicide attempt compared to White heterosexual youth [13, 59], whereas identifying as Asian and bisexual was associated with less suicide risk than

identifying as a White heterosexual [59]. In contrast to these findings, however, two studies found that Black bisexual youth had increased odds of reporting suicidal behavior than White heterosexual [13] and gay [58] youth. Overall, more research is needed to elucidate the effects of intersectionality on SITBs, as well as explain discrepancies across studies.

Researchers found a significant interaction between sexual orientation and disability status in predicting suicidal ideation, such that sexual minority adolescents with a disability had the highest risk of suicidal ideation (ARR = 2.82), followed by sexual minority adolescents without a disability (ARR = 2.17) and heterosexual youth with a disability (ARR = 1.97), compared to heterosexual youth without a disability [88]. In contrast, other investigators did not find a significant interaction between sexual orientation and homelessness in predicting suicide-related outcomes [54].

Individual-Level Risk and Protective Factors

Minority Stress Meyer's [89] minority stress model offers culture-specific insights as to why sexual minority individuals are at elevated risk for suicidal thoughts and behaviors. Specifically, the minority stress model theorizes that external prejudice (e.g., harassment, victimization, rejection) experienced by sexual minority individuals may generate internal minority stress processes (e.g., internalized stigma, expectations of rejection, concealment) that contribute to poorer psychological well-being and risk for suicidality [90, 91]. Components of this model have been tested with sexual and gender minority youth. Most prominently, the effects of bullying and victimization on SITBs among sexual and gender minority youth have been examined in 28 published studies within the past 5 years. In the vast majority of these studies, bullying victimization and other forms of victimization were associated with greater risk of SITBs among sexual [12, 15, 16, 20, 39, 44, 46, 48, 49, 52, 58, 76, 92–96] and gender [12, 76, 79, 82, 95] minority youth. Moreover, bullying and other victimization experiences accounted for the association (e.g., mediating effect) between sexual orientation/gender identity and SITBs in several studies [24, 33, 43, 97, 98], though this indirect effect was not found in other studies [11, 14, 42]. In addition to bullying victimization more generally, five studies examined the effects of anti-LGBT and gender-based victimization. In all five studies, LGBT-specific victimization was positively associated with SITBs in sexual minority youth [15, 33, 43, 52, 99].

Other minority stress factors, particularly internal minority stressors, have been examined among this population less frequently. Goldbach and colleagues [100] identified family rejection, difficulties with identity management, negative sexual/gender identity disclosure experiences, homonegative communication with others, negative expectancies about future treatment, stress associated with religion, and internalized

homonegativity as predictors of SITBs. However, Smith and colleagues [101] found that the vast majority of gender/sexual minority-specific factors did not remain significant predictors of SITBs after accounting for lifetime SITBs and general mental health. Likewise, sexual concerns/internalized homophobia did not account for the association between sexual orientation and lifetime NSSI [67]. Finally, sexual minority youth with numerous adverse childhood experiences or maltreatment had higher rates of SITBs [18, 62, 102], though the link between sexual orientation and these outcomes was not explained by abuse history [11].

General Mental Health Several facets of general mental health were examined as risk factors for SITBs among sexual and gender minority youth, including depression/hopelessness, alcohol/substance use, emotion regulation, self-compassion and self-esteem, help-seeking beliefs, sleep, body mass index (BMI)/body image, and engagement in physical activity. Among all 12 studies examining depression and hopelessness, these factors were consistently and perniciously linked to suicide ideation, plans, attempts, and NSSI among sexual [11, 35, 39, 44, 46, 48, 97] and gender [73, 79, 82, 101, 103] minority youth. Indeed, in several studies, depression accounted for the link between sexual/gender minority status and suicidal ideation [35, 73, 97]. Similarly, sexual minority youth who used alcohol [42, 52] and/or engaged in other substance use or high-risk behaviors [44, 48, 96], and sexual and gender minority youth who reported intentions to use substances [103], were at higher risk for suicide ideation, plans, and attempts. In one study, researchers examined emotion regulation skills and found that emotion regulation accounted for the association between sexual orientation and NSSI [67].

Findings related to the self were mixed. Self-esteem was protective against suicide-related outcomes and self-harm, and accounted for the relation between sexual minority status and these outcomes [35]. Likewise, self-compassion was protective against suicidal ideation and suicide attempts among sexual and gender minority youth, buffering the association between peer victimization and suicide attempts [95]. However, although self-efficacy was protective against suicidality (a combined variable reflecting the presence of suicide ideation, plans, and/or attempts) in heterosexual students, this effect was not found among sexual minority students [16]. On the other hand, self-criticism was positively associated with suicide plans and NSSI among sexual and gender minority youth, but it was unrelated to suicidal ideation and suicide attempts [101]. Finally, among sexual and gender minority youth, help-seeking beliefs directly related to suicide attempts, whereas the interaction between help-seeking beliefs and depression related to suicidal ideation [103].

Finally, five studies examined factors related to sexual and gender minority youths' bodies and physical health in association with SITBs. BMI and perceptions of weight moderated

the association between sexual minority status and suicide ideation, plans, and attempts among sexual minority girls [26], and between sexual minority status and suicide attempts among sexual minority boys [53]. Namely, girls who perceived themselves as overweight and boys with a BMI in the obese range were at highest risk for suicide-related outcomes compared to those across all other weight categories and genders. Body image, on the other hand, was unrelated to SITBs after accounting for other risk factors, including a lifetime history of SITBs, self-criticism, and minority stress factors [101]. Similarly, sleep quality accounted for the relationship between sexual minority status and suicidal ideation and suicide attempts [104]. Overall, sexual minority adolescents who engage in more protective behaviors, including getting adequate sleep and physical activity/participation in sports, tend to be less likely to report engaging in suicidal behaviors than those who engage in few protective, but many risky, behaviors [96].

Sexual/Intimate Factors Researchers have examined several characteristics related to sexual history/behaviors in relation to SITBs among sexual minority youth, including age of sexual debut, discordance between sexual behaviors and sexual identity, having multiple lifetime partners, and engaging in unsafe sexual practices. Having multiple (e.g., 4+) sexual partners within the past year has been linked to the likelihood of past-year suicide attempts [96, 105], whereas unsafe sexual practices were associated with both suicidal ideation and attempts [105]. Moreover, those whose sexual behaviors were discordant from their sexual identity were at highest risk for suicide [106]. On the other hand, there was no association between initial age of sexual experience (i.e., “sexual debut”) and SITBs among sexual minority youth [32, 105].

Dating/intimate partner violence also demonstrated positive associations with suicide ideation, plans, and attempts among sexual [12, 46, 48] and gender [12] minority youth. Likewise, experiencing sexual assault was linked to higher rates of suicide ideation, plans, and attempts [44, 46, 48], as well as NSSI among sexual minority girls [44]. These risk factors largely align with those among adolescents and youth more broadly.

Social Support Numerous studies ($k = 17$) investigated the role of various types of social support (e.g., parental, peers, school/teachers) on SITBs among sexual and gender minority youth. Studies examining social support broadly indicated that, although social support was protective against suicidal ideation for heterosexual youth, this effect was not found among sexual minority youth [16, 19]. Likewise, another study found that social support was not directly associated with suicidal ideation among sexual minority youth but, rather, had an indirect relationship with ideation via depression symptoms [97], suggesting that social support more generally may not

relate directly to suicide-related outcomes among sexual minority youth. Findings were also mixed regarding the role of parental connection and support vs. neglect and rejection. For instance, several studies have provided evidence that parental connectedness may be protective against NSSI, suicidal ideation, and suicide attempts among gender minority youth [75, 82] and bisexual, but not gay or lesbian, youth [39]. Likewise, parental rejection, particularly maternal rejection, was linked to more severe suicidal ideation among sexual minority youth [107]. Family connection and support more broadly were similarly associated with lower rates of NSSI [72, 80, 101] and suicide attempts [80], but not suicidal ideation or plans [101] among gender minority youth. However, other studies found that parental abuse/neglect is unrelated to suicidal ideation [79], that good communication with parents does not reduce rates of suicidal ideation and attempts [42], and that parental support does not moderate the relationship between peer victimization and suicide ideation or attempts [95].

Outside of the home, connectedness to non-parental adults has been linked to less NSSI [82] and suicide ideation/attempts [75] among gender minority youth, as well as less suicidal ideation among bisexual (but not gay/lesbian) youth [39]. Similar findings emerged within schools. Greater teacher and school connectedness/belongingness were linked to lower levels of suicidal ideation [52, 95], but not suicide attempts [95], among sexual and gender minority youth. Likewise, the effect of school-based victimization on suicidal ideation and attempts was stronger among sexual minority youth with poor classmate and/or teacher relationships than among those with average or good classmate and teacher relationships [24]. Peer relationships, on the other hand, yielded more mixed findings. One study found a protective effect for perceived caring from friends on NSSI among bisexual, but not gay or lesbian, youth [39]. However, another study indicated that peer connectedness was unrelated to NSSI among gender minority youth [82], and yet others indicated that peer support and being able to discuss problems with friends was associated with *higher* levels of NSSI [80] and suicidality [49].

Macro-Level Risk and Protective Factors

A total of 10 studies examined macro- or societal-level risk and protective factors for SITBs among sexual and gender minority youth [12, 37, 41, 48, 57, 75, 94, 100, 108, 109]. Of these, seven studies investigated school environments, whereas four investigated the impact of state policies on SITB-related outcomes among sexual and gender minority youth.

School Environment Several characteristics of school environments have been linked to SITBs among sexual minority youth. Specifically, perceptions of a homonegative climate at school (e.g., “it’s hard to be an LGB student at my school”),

as well as perceptions of school violence and feeling less safe at school, were positively associated with NSSI, suicidal ideation, and suicide attempts among sexual and gender minority adolescents [12, 75, 100]. Conversely, the presence of a school-based health center was protective against suicide ideation and attempts among sexual minority adolescents [41], and among sexual minority girls, a greater presence of LGBTQ students in one's school was protective against suicide attempts and buffered the effects of bullying victimization on suicide attempts [94]. Moreover, LGBTQ-specific educational presentations [108], including LGBTQ-inclusive sex education [37], and youth development opportunities more generally [75] were protective against suicidal ideation. Together, these findings suggest that environmental factors at school may influence individual-level risk for suicide among sexual minority youth.

State-Level Policies The little research that examined statewide anti-bullying laws [109] or anti-LGBTQ discrimination policies [37] over the past 5 years found minimal associations between these laws and policies and reduced likelihood of suicide ideation or attempts among sexual minority youth. Similarly, state-level immigration climates were unrelated to suicidal ideation, plans, or attempts among Hispanic/Latino(a) sexual minority adolescents [48]. However, the statewide adoption of same-sex marriage policies was associated with a modest (7.0%) reduction in the proportion of high school students, particularly sexual minority students, who reported a past-year suicide attempt [57]. Associations between state-level policies and SITBs among gender minority youth were not examined during the timeframe of this review.

General Discussion

Limitations and Future Directions of the Evidence

This review summarizes nearly 100 empirical studies published within the past 5 years that examine factors associated with SITBs among sexual and gender minority youth. Nonetheless, this review reveals numerous gaps in our current knowledge. First, the vast majority of studies ($k = 78$) were epidemiological in nature, and moreover, over a third of all studies ($k = 37$) used various configurations of the YRBSS. Although the YRBSS provides excellent data on national representative samples of youth, the potential overlap across samples in this review limits the conclusions that can be drawn from these studies. Moreover, two limitations of the YRBSS include the lack of items assessing identity-specific factors that may help explain rates of SITBs among this population and the lack of an item assessing gender identity in the national survey. Second, many of these studies included only a small proportion of sexual and/or gender minority youth, which

limits the representativeness of these samples to the LGBTQ population more broadly. Third, nearly all studies included in this review were cross-sectional ($k = 92$); although longitudinal studies were included, caution is warranted in extrapolating from these findings.

Overall, further delineation of factors underlying rates of SITBs among sexual and gender minority youth is needed. In particular, assessing identity-specific factors among large, representative samples of youth may be informative, as would additional research on protective factors more generally. As identified in this review, most studies examining individual factors contributing to SITBs among sexual and gender minority youth focused on risk, as opposed to protective, factors. Thus, a dearth of research exists that examines factors that enhance resilience, especially identity-specific protective factors, among this population. Moreover, examination of disparities and differences in risk across various subgroups of LGBTQ youth is needed. Given the identification of disparities among subgroups of LGBTQ youth (e.g., bisexual vs. gay/lesbian vs. questioning; transgender vs. non-binary) in this review, clarification of the nature and causes of these disparities may inform the development of targeted interventions. Likewise, intersectionality research is crucial, particularly given evidence that other sociodemographic factors, including race/ethnicity, disability status, and homelessness, may interact with sexual orientation and gender identity to further exacerbate risk.

Finally, as noted previously, nearly all studies included in this review were cross-sectional, precluding any examination of temporality or causality. The utilization of longitudinal designs in future research may clarify the nature of individual and macro risk and protective factors, facilitate understanding of the development and course of SITBs over time, and identify periods of heightened risk. This information may then be used to inform the development, implementation, and evaluation of evidence-based interventions that serve to reduce risk for SITBs among sexual and gender minority youth.

Strengths and Limitations of the Present Review

Notwithstanding the strengths of the present review, including a systematic approach to reviewing the recent (i.e., past five years) empirical literature on SITBs among sexual and gender minority youth, there are a few noteworthy limitations to consider. First, although the focus of the review was on recent research, the population, culture, and rates of SITBs among sexual and gender minority youth are constantly evolving, so findings may not accurately represent SITBs among current sexual and gender minority youth. Second, as with any review, there is a risk of publication bias. Only peer-reviewed studies were discussed. Although this approach enhanced the scientific rigor of the findings, the process may have led to the omission of other recent reports (e.g., dissertations). Finally,

this review was limited to papers published in English, so included studies were predominantly from the USA and other English-speaking countries (though with exceptions, including several studies conducted in China and South Korea). Thus, the literature included in this review may not be generalizable to other countries, particularly non-Western countries, and important findings may not have been identified for inclusion.

Conclusions

Findings from this systematic review revealed that sexual and gender minority youth continue to demonstrate elevated risk for SITBs compared to heterosexual youth and the general population. Although most studies were epidemiological in design and primarily examined prevalence rates in these populations, several individual risk factors were consistently identified, including bullying and other forms of victimization, minority identity-specific discrimination and harassment, general mental health facets (e.g., depression, hopelessness, substance use), and sexual assault and intimate partner violence. Conversely, evidence for individual protective factors—particularly social support—was mixed. Nonetheless, several studies examined the role of macro-level (i.e., school-based and statewide) policies that reduced risk of SITBs among sexual and gender minority youth, including LGBTQ-specific education, youth development opportunities, and statewide anti-bullying, anti-LGBT discrimination, and same-sex marriage policies.

Ultimately, further research is warranted to better understand factors contributing to the prevalence of SITBs among sexual and gender minority youth. In particular, the use of a social-ecological perspective that integrates multiple levels of influence may be warranted. In doing so, evidence-based interventions—at the individual, interpersonal, community, and societal levels—can then be developed, empirically tested, and disseminated broadly, with the ultimate aim of reducing suffering and rates of SITBs among sexual and gender minority youth.

Compliance with Ethical Standards

Conflict of Interest The authors have no disclosures or conflicts of interest to report.

References

- Centers for Disease Control and Prevention [CDC]. WISQARS: web-based inquiry statistics query and reporting system [Internet]. 2016. Available from: <http://www.cdc.gov/ncipc/wisqars/default.htm>.

- Miron O, Yu K, Wilf-Miron R, Kohane IS. Suicide rates among adolescents and young adults in the United States, 2000–2017. *JAMA*. 2019;321:2362–4.
- Kann L, McManus T, Harris WA, Shanklin SL, Flint KH, Queen B, et al. Youth risk behavior surveillance—United States, 2017. *MMWR Surveill Summ*. 2018;67:1–114.
- Muehlenkamp JJ, Claes L, Havertape L, Plener PL. International prevalence of adolescent non-suicidal self-injury and deliberate self-harm. *Child Adolesc Psychiatry Ment Health*. 2012;6:10.
- Asarnow JR, Porta G, Spirito A, Emslie G, Clarke G, Wagner KD, et al. Suicide attempts and nonsuicidal self-injury in the treatment of resistant depression in adolescents: findings from the TORDIA trial. *J Am Acad Child Adolesc Psychiatry*. 2011;50:772–81.
- Ribeiro JD, Franklin JC, Fox KR, Bentley KH, Kleiman EM, Chang BP, et al. Self-injurious thoughts and behaviors as risk factors for future suicide ideation, attempts, and death: a meta-analysis of longitudinal studies. *Psychol Med*. 2016;46:225–36.
- Haas AP, Eliason M, Mays VM, Mathy RM, Cochran SD, D’Augelli AR, et al. Suicide and suicide risk in lesbian, gay, bisexual, and transgender populations: review and recommendations. *J Homosex*. 2011;58:10–51.
- Plöderl M, Wagenmakers E, Tremblay P, Ramsay R, Kralovec K, Fartacek C, et al. Suicide risk and sexual orientation: a critical review. *Arch Sex Behav*. 2013;42:715–27.
- Johns MM, Lowry R, Andrzejewski J, Barrios LC, Demissie Z, McManus T, et al. Transgender identity and experiences of violence victimization, substance use, suicide risk, and sexual risk behaviors among high school students—19 states and large urban school districts, 2017. *MMWR Morb Mortal Wkly Rep*. 2019;68:67–71.
- Blashill AJ, Calzo JP. Sexual minority children: mood disorders and suicidality disparities. *J Affect Disord*. 2019;246:96–8.
- Peters JR, Mereish EH, Krek MA, Chuong A, Ranney ML, Solomon J, et al. Sexual orientation differences in non-suicidal self-injury, suicidality, and psychosocial factors among an inpatient psychiatric sample of adolescents. *Psychiatry Res*. 2020;284:112664.
- Espelage DL, Merrin GJ, Hatchel T. Peer victimization and dating violence among LGBTQ youth: the impact of school violence and crime on mental health outcomes. *Youth Violence Juvenile Justice US*: Sage Publications. 2018;16:156–73.
- Baiden P, LaBrenz CA, Asiedua-Baiden G, Muehlenkamp JJ. Examining the intersection of race/ethnicity and sexual orientation on suicidal ideation and suicide attempt among adolescents: findings from the 2017 Youth Risk Behavior Survey. *J Psychiatr Res*. 2020;125:13–20.
- Ballard ME, Jameson JP, Martz DM. Sexual identity and risk behaviors among adolescents in rural Appalachia. *J Rural Ment Health US*: Educational Publishing Foundation. 2017;41:17–29.
- Barnett AP, Molock SD, Nieves-Lugo K, Zea MC. Anti-LGBT victimization, fear of violence at school, and suicide risk among adolescents. *Psychol Sex Orientat Gend Divers US*: Educational Publishing Foundation. 2019;6:88–95.
- Button DM. A general strain approach comparing the effects of victimization, social support, and perceived self-efficacy on LGBQ and heterosexual youth suicidality. *Crim Justice Stud Routledge*. 2015;28:484–502.
- Caputi TL, Smith D, Ayers JW. Suicide risk behaviors among sexual minority adolescents in the United States, 2015. *JAMA*. 2017;318:2349–51.
- Clements-Nolle K, Lensch T, Baxa A, Gay C, Larson S, Yang W. Sexual identity, adverse childhood experiences, and suicidal behaviors. *J Adolesc Health*. 2018;62:198–204.
- Coulter RWS, Kessel Schneider S, Beadnell B, O’Donnell L. Associations of outside- and within-school adult support on

- suicidality: moderating effects of sexual orientation. *Am J Orthop*. 2017;87:671–9.
20. Eisenberg ME, Gower AL, McMorris BJ. Emotional health of lesbian, gay, bisexual and questioning bullies: does it differ from straight bullies? *J Youth Adolesc*. 2016;45:105–16.
 21. Fish JN, Pasley K. Sexual (minority) trajectories, mental health, and alcohol use: a longitudinal study of youth as they transition to adulthood. *J Youth Adolesc*. 2015;44:1508–27.
 22. Goodin A, Elswick A, Fallin-Bennett A. Mental health disparities and high-risk alcohol use among non-heterosexual high school students. *Perspect Psychiatr Care*. 2019;55:570–5.
 23. Huang Y, Li P, Guo L, Gao X, Xu Y, Huang G, et al. Sexual minority status and suicidal behaviour among Chinese adolescents: a nationally representative cross-sectional study. *BMJ Open*. British Medical Journal Publishing Group. 2018;8:e020969.
 24. Huang Y, Li P, Lai Z, Jia X, Xiao D, Wang T, et al. Association between sexual minority status and suicidal behavior among Chinese adolescents: a moderated mediation model. *J Affect Disord*. 2018;239:85–92.
 25. Jiang Y, Reilly-Chammat R, Cooper T, Viner-Brown S. Disparities in health risk behaviors and health conditions among Rhode Island sexual minority and unsure high school students. *J Sch Health*. 2018;88:803–12.
 26. Johns MM, Lowry R, Demissie Z, Robin L. Harassment and mental distress among adolescent female students by sexual identity and BMI or perceived weight status. *Obesity*. 2017;25:1421–7.
 27. Johns MM, Lowry R, Rasberry CN, Dunville R, Robin L, Pampati S, et al. Violence victimization, substance use, and suicide risk among sexual minority high school students-United States, 2015–2017. *MMWR Morb Mortal Wkly Rep*. 2018;67:1211–5.
 28. Kim GH, Ahn HS, Kim HJ. Type of sexual intercourse experience and suicidal ideation, plans, and attempts among youths: a cross-sectional study in South Korea. *BMC Public Health*. 2016;16:1229. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5142152/>.
 29. Kwak Y, Kim J. Associations between Korean adolescents' sexual orientation and suicidal ideation, plans, attempts, and medically serious attempts. *Iran J Public Health*. 2017;46:475–84.
 30. Lee D, Kim S, Woo SY, Yoon B, Choi D. Associations of health-risk behaviors and health cognition with sexual orientation among adolescents in school: analysis of pooled data from Korean nationwide survey from 2008 to 2012. *Medicine (Baltimore)*. 2016;95:e3746.
 31. Liu RT, Walsh RFL, Sheehan AE, Cheek SM, Carter SM. Suicidal ideation and behavior among sexual minority and heterosexual youth: 1995–2017. *Pediatrics*. 2020;145(3):e20192221. Available from: <https://pediatrics.aappublications.org/content/145/3/e20192221>.
 32. Lowry R, Dunville R, Robin L, Kann L. Early sexual debut and associated risk behaviors among sexual minority youth. *Am J Prev Med*. 2017;52:379–84.
 33. Mereish EH, Sheskie M, Hawthorne DJ, Goldbach JT. Sexual orientation disparities in mental health and substance use among Black American young people in the USA: effects of cyber and bias-based victimisation. *Cult Health Sex*. 2019;21:985–98.
 34. Mueller AS, James W, Abrutyn S, Levin ML. Suicide ideation and bullying among US adolescents: examining the intersections of sexual orientation, gender, and race/ethnicity. *Am J Public Health American Public Health Association*. 2015;105:980–5.
 35. Oginni OA, Robinson EJ, Jones A, Rahman Q, Rimes KA. Mediators of increased self-harm and suicidal ideation in sexual minority youth: a longitudinal study. *Psychol Med*. 2019;49:2524–32.
 36. Perales F, Campbell A. Early roots of sexual-orientation health disparities: associations between sexual attraction, health and well-being in a national sample of Australian adolescents. *J Epidemiol Community Health*. 2019;73:954–62.
 37. Proulx CN, Coulter RWS, Egan JE, Matthews DD, Mair C. Associations of lesbian, gay, bisexual, transgender, and questioning-inclusive sex education with mental health outcomes and school-based victimization in U.S. high school students. *J Adolesc Health*. 2019;64:608–14.
 38. Romanelli M, Xiao Y, Lindsey MA. Sexual identity–behavior profiles and suicide outcomes among heterosexual, lesbian, and gay sexually active adolescents. *Suicide Life Threat Behav*. 2020. Available from: <https://doi.org/10.1111/sltb.12634>.
 39. Taliaferro LA, Muehlenkamp JJ. Nonsuicidal self-injury and suicidality among sexual minority youth: risk factors and protective connectedness factors. *Acad Pediatr*. 2017;17:715–22.
 40. Zaza S, Kann L, Barrios LC. Lesbian, gay, and bisexual adolescents: population estimate and prevalence of health behaviors. *JAMA*. 2016;316:2355–6.
 41. Zhang L, Finan LJ, Bersamin M, Fisher DA. Sexual orientation–based depression and suicidality health disparities: the protective role of school-based health centers. *J Res Adolesc*. 2020;30:134–42.
 42. Arnarsson A, Sveinbjomsdottir S, Thorsteinsson EB, Bjarnason T. Suicidal risk and sexual orientation in adolescence: a population-based study in Iceland. *Scand J Public Health*. 2015;43:497–505.
 43. Bouris A, Everett BG, Heath RD, Elsaesser CE, Neilands TB. Effects of victimization and violence on suicidal ideation and behaviors among sexual minority and heterosexual adolescents. *LGBT Health*. 2016;3:153–61.
 44. DeCamp W, Bakken NW. Self-injury, suicide ideation, and sexual orientation: differences in causes and correlates among high school students. *J Inj Violence Res*. 2016;8:15–24.
 45. Fox KR, Choukas-Bradley S, Salk RH, Marshal MP, Thoma BC. Mental health among sexual and gender minority adolescents: examining interactions with race and ethnicity. *J Consult Clin Psychol US: American Psychological Association*. 2020;88:402–15.
 46. Richardson SC, Hales T, Meehan E, Waters A. Sexual minorities and teen suicide attempts in a southeastern state with prominent exclusionary policies. *Death Stud*. 2020;1–6. Available from: <https://doi.org/10.1080/07481187.2020.1744202>.
 47. Roberts R, Black G, Hart T. Same-sex-attracted adolescents in rural Australia: stressors, depression and suicidality, and barriers to seeking mental health support. *Rural Remote Health*. 2018;18:4364.
 48. Boyas JF, Villarreal-Otálora T, Alvarez-Hernandez LR, Fatehi M. Suicide ideation, planning, and attempts: the case of the Latinx LGB youth. *Health Promot Perspect*. 2019;9:198–206.
 49. Button DM. Understanding the effects of victimization: applying general strain theory to the experiences of LGBQ youth. *Deviant Behav*. United Kingdom: Taylor & Francis. 2016;37:537–56.
 50. Feinstein BA, Turner BC, Beach LB, Korpak AK, Phillips G. Racial/ethnic differences in mental health, substance use, and bullying victimization among self-identified bisexual high school-aged youth. *LGBT Health*. Mary Ann Liebert, Inc., publishers. 2019;6:174–83.
 51. Turpin RE, Rosario A, Wang MQ. Victimization, depression, and the suicide cascade in sexual minority youth. *J Ment Health Abingdon Engl*. 2020;29:225–33.
 52. Whitaker K, Shapiro VB, Shields JP. School-based protective factors related to suicide for lesbian, gay, and bisexual adolescents. *J Adolesc Health*. 2016;58:63–8.
 53. Huang Y, Li P, Lai Z, Jia X, Xiao D, Wang T, et al. Chinese sexual minority male adolescents' suicidality and body mass index. *Int J Environ Res Public Health*. 2018;15:2558. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6266787/>.

54. Cutuli JJ, Treglia D, Herbers JE. Adolescent homelessness and associated features: prevalence and risk across eight states. *Child Psychiatry Hum Dev.* 2020;51:48–58.
55. Turpin RE, Boekeloo B, Dyer T. Sexual identity modifies the association between bullying and suicide planning among adolescents with same-sex sexual partners. *J LGBT Youth Routledge.* 2019;16:300–16.
56. Raifman J, Charlton BM, Arrington-Sanders R, Chan PA, Rusley J, Mayer KH, et al. Sexual orientation and suicide attempt disparities among US adolescents: 2009–2017. *Pediatrics.* 2020;145:e20191658. Available from: <https://pediatrics.aappublications.org/content/145/3/e20191658>.
57. Raifman J, Moscoe E, Austin SB, McConnell M. Difference-in-differences analysis of the association between state same-sex marriage policies and adolescent suicide attempts. *JAMA Pediatr.* 2017;171:350–6.
58. Turpin RE, Rosario AD, Dyer TV. Substance use and suicide attempts among adolescent males who are members of a sexual minority: a comparison of synthesized substance-use measures. *Am J Epidemiol.* 2020. Available from: <https://doi.org/10.1093/aje/kwaa055/5819315>.
59. Toomey RB, Syvertsen AK, Flores M. Are developmental assets protective against suicidal behavior? Differential associations by sexual orientation. *J Youth Adolesc.* 2019;48:788–801.
60. DeCou CR, Lynch SM. Sexual orientation, gender, and attempted suicide among adolescent psychiatric inpatients. *Psychol Serv US: Educational Publishing Foundation.* 2018;15:363–9.
61. Irish M, Solmi F, Mars B, King M, Lewis G, Pearson RM, et al. Depression and self-harm from adolescence to young adulthood in sexual minorities compared with heterosexuals in the UK: a population-based cohort study. *Lancet Child Adolesc Health.* Elsevier. 2019;3:91–8.
62. Li X, Zheng H, Tucker W, Xu W, Wen X, Lin Y, et al. Research on relationships between sexual identity, adverse childhood experiences and non-suicidal self-injury among rural high school students in less developed areas of China. *Int J Environ Res Public Health.* 2019;16:3158.
63. Liu RT. Temporal trends in the prevalence of nonsuicidal self-injury among sexual minority and heterosexual youth from 2005 through 2017. *JAMA Pediatr.* 2019. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6547150/>.
64. Monto MA, McRee N, Deryck FS. Nonsuicidal self-injury among a representative sample of US adolescents, 2015. *Am J Public Health.* 2018;108:1042–8.
65. Watson RJ, Peter T, McKay T, Edkins T, Saewyc E. Evidence of changing patterns in mental health and depressive symptoms for sexual minority adolescents. *J Gay Lesbian Ment Health.* 2018;22:120–38.
66. Amos R, Manalastas EJ, White R, Bos H, Patalay P. Mental health, social adversity, and health-related outcomes in sexual minority adolescents: a contemporary national cohort study. *Lancet Child Adolesc Health.* 2020;4:36–45.
67. Fraser G, Wilson MS, Garisch JA, Robinson K, Brocklesby M, Kingi T, et al. Non-suicidal self-injury, sexuality concerns, and emotion regulation among sexually diverse adolescents: a multiple mediation analysis. *Arch Suicide Res.* 2018;22:432–52.
68. Hirschtritt ME, Dauria EF, Marshall BDL, Tolou-Shams M. Sexual minority, justice-involved youth: a hidden population in need of integrated mental health, substance use, and sexual health services. *J Adolesc Health.* 2018;63:421–8.
69. Becerra-Culqui TA, Liu Y, Nash R, Cromwell L, Flanders WD, Getahun D, et al. Mental health of transgender and gender nonconforming youth compared with their peers. *Pediatrics.* 2018;141:e20173845. Available from: <https://pediatrics.aappublications.org/content/141/5/e20173845>.
70. Eisenberg ME, Gower AL, McMorris BJ, Rider GN, Shea G, Coleman E. Risk and protective factors in the lives of transgender/gender nonconforming adolescents. *J Adolesc Health.* 2017;61:521–6.
71. Jackman KB, Caceres BA, Kreuze EJ, Bockting WO. Suicidality among gender minority youth: analysis of 2017 youth risk behavior survey data. *Arch Suicide Res.* 2019;1–16. <https://doi.org/10.1080/13811118.2019.1678539>.
72. Katz-Wise SL, Ehrensaft D, Veters R, Forcier M, Austin SB. Family functioning and mental health of transgender and gender-nonconforming youth in the Trans Teen and Family Narratives Project. *J Sex Res.* 2018;55:582–90.
73. Perez-Brumer A, Day JK, Russell ST, Hatzembuehler ML. Prevalence and correlates of suicidal ideation among transgender youth in California: findings from a representative, population-based sample of high school students. *J Am Acad Child Adolesc Psychiatry.* 2017;56:739–46.
74. Thoma BC, Salk RH, Choukas-Bradley S, Goldstein TR, Levine MD, Marshal MP. Suicidality disparities between transgender and cisgender adolescents. *Pediatrics.* 2019;144:e20191183. Available from: <https://pediatrics.aappublications.org/content/144/5/e20191183>.
75. Gower AL, Rider GN, Brown C, McMorris BJ, Coleman E, Taliaferro LA, et al. Supporting transgender and gender diverse youth: protection against emotional distress and substance use. *Am J Prev Med.* 2018;55:787–94.
76. Hatchel T, Valido A, De Pedro KT, Huang Y, Espelage DL. Minority stress among transgender adolescents: the role of peer victimization, school belonging, and ethnicity. *J Child Fam Stud.* 2019;28:2467–76.
77. Veale JF, Watson RJ, Peter T, Saewyc EM. Mental health disparities among Canadian transgender youth. *J Adolesc Health.* 2017;60:44–9.
78. Nahata L, Quinn GP, Caltabellotta NM, Tishelman AC. Mental health concerns and insurance denials among transgender adolescents. *LGBT Health.* 2017;4:188–93.
79. Peng K, Zhu X, Gillespie A, Wang Y, Gao Y, Xin Y, et al. Self-reported rates of abuse, neglect, and bullying experienced by transgender and gender-nonbinary adolescents in China. *JAMA Netw Open American Medical Association.* 2019;2:e1911058.
80. Ross-Reed DE, Reno J, Peñaloza L, Green D, FitzGerald C. Family, school, and peer support are associated with rates of violence victimization and self-harm among gender minority and cisgender youth. *J Adolesc Health Elsevier.* 2019;65:776–83.
81. Butler C, Joiner R, Bradley R, Bowles M, Bowes A, Russell C, et al. Self-harm prevalence and ideation in a community sample of cis, trans and other youth. *Int J Transgend Taylor & Francis.* 2019;20:447–58.
82. Taliaferro LA, McMorris BJ, Eisenberg ME. Connections that moderate risk of non-suicidal self-injury among transgender and gender non-conforming youth. *Psychiatry Res.* 2018;268:65–7.
83. Meyer IH. Does an improved social environment for sexual and gender minorities have implications for a new minority stress research agenda? *Psychol Sex Rev.* 2016;7:81–90.
84. Smith TW, Son J, Kim J. Public attitudes toward homosexuality and gay rights across time and countries. *Unpubl Manuscr.* 2014. Available from: <https://escholarship.org/uc/item/4p93w90c>.
85. Peter T, Edkins T, Watson R, Adjei J, Homma Y, Saewyc E. Trends in suicidality among sexual minority and heterosexual students in a Canadian population-based cohort study. *Psychol Sex Orientat Gen Divers.* 2017;4:115–23.
86. Porta CM, Watson RJ, Doull M, Eisenberg ME, Grumdahl N, Saewyc E. Trend disparities in emotional distress and suicidality among sexual minority and heterosexual Minnesota adolescents from 1998 to 2010. *J Sch Health.* 2018;88:605–14.

87. Gattamorta KA, Salerno JP, Castro AJ. Intersectionality and health behaviors among US high school students: examining race/ethnicity, sexual identity, and sex. *J Sch Health*. 2019;89:800–8.
88. Higgins Tejera C, Horner-Johnson W, Andresen EM. Application of an intersectional framework to understanding the association of disability and sexual orientation with suicidal ideation among Oregon teens. *Disabil Health J*. 2019;12:557–63.
89. Meyer IH. *Minority stress and mental health in gay men*. New York: Columbia University Press; 2003. pp. 699–731. Available from: <http://search.proquest.com/psycinfo/docview/619998052/A2AF9615B7F34ED7PQ/7?accountid=4840>.
90. Baams L, Grossman AH, Russell ST. Minority stress and mechanisms of risk for depression and suicidal ideation among lesbian, gay, and bisexual youth. *Dev Psychol*. 2015;51:688–96.
91. Hatzenbuehler ML. How does sexual minority stigma “get under the skin”? A psychological mediation framework. *Psychol Bull*. 2009;135:707–30.
92. Duarte C, Pittman SK, Thorsen MM, Cunningham RM, Ranney ML. Correlation of minority status, cyberbullying, and mental health: a cross-sectional study of 1031 adolescents. *J Child Adolesc Trauma Germany: Springer*. 2018;11:39–48.
93. Dunn HK, Clark MA, Pearlman DN. The relationship between sexual history, bullying victimization, and poor mental health outcomes among heterosexual and sexual minority high school students: a feminist perspective. *J Interpers Violence*. SAGE PublicationsSage CA: Los Angeles, CA; 2015. Available from: <https://doi.org/10.1177/0886260515599658>.
94. Eisenberg ME, McMorris BJ, Gower AL, Chatterjee D. Bullying victimization and emotional distress: is there strength in numbers for vulnerable youth? *J Psychosom Res*. 2016;86:13–9.
95. Hatchel T, Merrin GJ, Espelage D. Peer victimization and suicidality among LGBTQ youth: the roles of school belonging, self-compassion, and parental support. *J LGBT Youth*. United Kingdom: Taylor & Francis; 2018.
96. Taliaferro LA, Gloppen KM, Muehlenkamp JJ, Eisenberg ME. Depression and suicidality among bisexual youth: a nationally representative sample. *J LGBT Youth*. Routledge. 2018;15:16–31.
97. Lardier DT Jr, Bermea AM, Pinto SA, Garcia-Reid P, Reid RJ. The relationship between sexual minority status and suicidal ideations among urban Hispanic adolescents. *J LGBT Issues Couns Routledge*. 2017;11:174–89.
98. Mendoza-Pérez JC, Ortiz-Hernández L. Violence as mediating variable in mental health disparities associated to sexual orientation among Mexican youths. *J Homosex*. 2019;66:510–32.
99. Ioeberger M, Henry KL, Chen PY, Cigularov KP, Tomazic RG. Beyond same-sex attraction: gender-variant-based victimization is associated with suicidal behavior and substance use for other-sex attracted adolescents. *PLoS One*. 2015;10:e0129976.
100. Goldbach JT, Schrage SM, Mamey MR. Criterion and divergent validity of the Sexual Minority Adolescent Stress Inventory. *Front Psychol*. 2017;8:2057. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5712417/>.
101. Smith DM, Wang SB, Carter ML, Fox KR, Hooley JM. Longitudinal predictors of self-injurious thoughts and behaviors in sexual and gender minority adolescents. *J Abnorm Psychol*. 2020;129:114–21.
102. Paul JC, Monahan EK. Sexual minority status and child maltreatment: how do health outcomes among sexual minority young adults differ due to child maltreatment exposure? *Child Abuse Negl*. 2019;96:104099.
103. Hatchel T, Ingram KM, Mintz S, Hartley C, Valido A, Espelage DL, et al. Predictors of suicidal ideation and attempts among LGBTQ adolescents: the roles of help-seeking beliefs, peer victimization, depressive symptoms, and drug use. *J Child Fam Stud*. 2019;28:2443–55.
104. Huang Y, Li P, Lai Z, Jia X, Xiao D, Wang T, et al. Role of sleep quality in mediating the relationship between sexual minority status and suicidal behavior among Chinese adolescents. *Psychol Res Behav Manag*. 2018;11:607–15.
105. Agnew-Brune CB, Balaji AB, Mustanski B, Newcomb ME, Prachand N, Braunstein SL, et al. Mental health, social support, and HIV-related sexual risk behaviors among HIV-negative adolescent sexual minority males: three U.S. cities, 2015. *AIDS Behav*. 2019;23:3419–26.
106. Amor FB, Clayton HB, Gilbert LK, Ivey-Stephenson AZ, Irving SM, David-Ferdon C, et al. Sexual orientation discordance and nonfatal suicidal behaviors in U.S. high school students. *Am J Prev Med*. 2018;54:530–8.
107. Reyes MES, Victorino MC, Chua AP, Oquendo FY, Puti AS, Reglos AA, et al. Perceived parental support as a protective factor against suicidal ideation of self-identified lesbian and gay Filipino adolescents. *N Am J Psychol*. 2015. Available from: /paper/Perceived-Parental-Support-as-a-Protective-Factor-Reyes-Victorino/408aee73a322f5dd6f7a8605572e853fdc8d80e1.
108. Burk J, Park M, Saewyc EM. A media-based school intervention to reduce sexual orientation prejudice and its relationship to discrimination, bullying, and the mental health of lesbian, gay, and bisexual adolescents in western Canada: a population-based evaluation. *Int J Environ Res Public Health*. 2018;15:2447.
109. Seelman KL, Walker MB. Do anti-bullying laws reduce in-school victimization, fear-based absenteeism, and suicidality for lesbian, gay, bisexual, and questioning youth? *J Youth Adolesc*. 2018;47:2301–19.

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