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Risk and Protective Factors for Substance Use among Sexual and Gender Minority Youth: A Scoping Review

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Abstract

Purpose of Review: Alcohol and drug use are common among youth. Rates are especially high among sexual and gender minority youth (SGMY; lesbian, gay, bisexual, transgender). We conducted a scoping review of research on risk and protective factors for substance use among SGMY published between 2013–2017.

Recent Findings: Ninety-seven studies met our inclusion criteria. Most focused on individual-level minority stress risk factors, particularly stigma. Fewer studies addressed protective factors such as social support or affirming policies, and few focused on gender minority youth (GMY). We identified important, yet understudied differences by race/ethnicity, sex assigned at birth, and sexual orientation.

Summary: Findings highlight growing interest in this topic as well as methodological/topical gaps in the literature. Research is needed to examine SGMY substance use in nationally representative samples; expand information about GMY; investigate racial/ethnic and sex/gender differences; improve measurement; and increase translation of findings to support prevention and treatment interventions for this at-risk population.

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Conflicts of Interest

The authors have no financial conflicts of interest to declare.

Human and Animal Rights and Informed Consent

This article does not contain any studies with human or animal subjects performed by any of the authors.

Keywords

Sexual minority; gender minority; substance use; alcohol; drug; youth

INTRODUCTION

Substance use is a major public health concern in the United States (US) and globally. The World Health Organization [1] estimates that alcohol, tobacco, and drug use contributed to 12.4% of deaths globally in 2000, and 2002–2030 projections by the Global Burden of Disease Project [2] estimate that five of the six fastest growing causes of global mortality are related to substance use. Many individuals begin using alcohol and drugs in adolescence [3], with 20% of adults with a substance use disorder having begun use before age 20 [4]. In the 2015 Youth Risk Behavior Surveillance System (YRBSS) survey of US 9th to 12th graders, 63.2% reported lifetime alcohol use (17.2% before age 13), 32.8% reported past-month alcohol consumption, 38.6% had used cannabis, and 16.8% reported prescription drug misuse [5].

Adolescence and young adulthood are also periods of identity exploration and consolidation, including sexual orientation and gender identity [6], which may confer additional risk. In this scoping review, we focus on risk and protective factors for alcohol and drug use among sexual and gender minority youth (SGMY)—a term that includes both sexual minority youth (SMY; e.g., lesbian, gay, bisexual, queer) and gender minority youth (GMY; e.g., transgender, genderqueer) as well as youth who are unsure of their sexual orientation and/or gender identity. We use the terms heterosexual and cisgender (individuals whose sex assigned at birth and current gender identity align) to describe individuals who are not SMY or GMY, respectively.

In 2011, the Institute of Medicine (now the National Academies of Medicine) [7] published its landmark report on sexual and gender minority health and concluded that SMY individuals face multiple health disparities beginning in childhood (e.g., suicidality, family rejection, homelessness, victimization, psychological distress). The 2015 YRBSS [5] found further evidence of alcohol and drug use disparities among SMY as compared to heterosexual youth. Although there is notably less research about GMY, existing findings suggest that this group is also at greater risk of heavy episodic drinking (HED), negative alcohol-related consequences, and drug use [8, 9]. Bisexual and questioning youth may be at particularly high risk for hazardous drinking and drug use [10]. Other demographic factors such as race/ethnicity and sex assigned at birth may impact substance use among SGMY. In some studies, racial/ethnic minority SMY have reported similar or lower rates of lifetime alcohol [11, 12] and drug use [13, 14], compared to White SMY. In analyses using YRBSS data, Talley et al [12] found multiple significant interaction effects between sexual orientation and sex, indicating larger alcohol-use disparities among young sexual minority women (SMW) than young sexual minority men (SMM). Adolescent (high-school age) SMW also reported higher rates of lifetime alcohol use and past-month HED than adolescent SMM, heterosexual girls, or heterosexual boys. Reducing these alcohol and drug use

disparities among SGMY requires understanding risk and protective factors relevant to this particular population.

METHODS

We conducted a scoping review using the following research question: “What risk and protective factors are associated with alcohol and drug use among SGMY?” Scoping reviews are well-suited for broad topics areas that contain primarily emerging literature. Such reviews differ from systematic reviews in that they aim to broadly describe trends and gaps in a particular literature [15], rather than rigorously critiquing study methodology.

Figure 1 illustrates the literature search and article screening process. In September 2017, we searched four databases to identify articles: PubMed [16], PsycInfo [17], Embase [18], and CINAHL [19]. We initially focused on articles published between 2010–2017 by combining three clusters (sexual orientation/gender identity, alcohol/drug, and youth) of search terms and subject headings (e.g., MeSH terms) (see Appendix A). This resulted in 4428 unique references. Next, we reviewed each article and selected those that were peer-reviewed, written in English, and focused on alcohol and/or drug use among SGMY using quantitative or qualitative methods. In keeping with the United Nations research definition of “youth,” we excluded articles focusing on individuals over age 24 [20]. We excluded articles focused on nicotine and tobacco use, behavioral addictions (e.g., gambling disorder), laxative abuse, or non-prescribed hormone use. Given the volume of relevant articles published between 2010–2017 (n=1053), we further restricted our review to the more recent publication years 2013–2017. We also excluded articles related to HIV/STI transmission (the topic of the large majority of SGMY research [21]). Finally, we excluded all articles not related to risk or protective factors (e.g., those that focused on prevalence). This resulted in 97 articles. Consistent with Arskey and O’Malley [22], we extracted information about methodology and key findings from each of the 97 articles to produce a thematic analysis of recent literature. We paid special attention to methodologic trends, the range and scope of findings, and gaps in the literature.

RESULTS

Table 1 summarizes study design characteristics and measurement of sexual orientation and gender identity in the 97 studies. Table 2 summarizes the alcohol and drug-related measures used. Below, we first summarize findings related to substance use generally, followed by separate summaries of alcohol and drug use findings. We then describe risk and protective factors for GMY and adolescent (high-school age) SMY. Finally, we comment on racial/ethnic- and sex-specific findings.

Substance Use Findings: Minority Stress Predictors Predominate the Literature

Over one-third (n=35; 36.1%) of the articles examined minority stress [23] as a predictor of substance use. Enacted stigma (e.g., assault, homophobia, discrimination) and anti-SMY policies were directly associated with overall substance use [24–30] and adverse substance use-related outcomes such as family conflict, car accidents, and legal consequences [11, 31]. School-based victimization was associated with heavier and more frequent substance use-

related consequences [32], an association that was partially explained by differences in peers' substance use norms. Studies that measured multiple sources of victimization reported mixed findings [33, 34], with familial factors potentially accounting for sexual identity differences in the association between victimization and substance use [34]. One study [35] also found that substance use was indirectly associated with prior suicide attempts via a three-way interaction of substance use with depressive and post-traumatic stress disorder (PTSD) symptoms.

Alcohol Use Findings: SMY—Seventy-seven studies (79.4%) examined alcohol use and these primarily focused on individual-level risk factors. Enacted stigma [24–26, 36–38] and perceived homophobia [39] generally predicted elevated rates of alcohol use [24–26] and adverse alcohol-related outcomes [11]. Intimate partner violence (IPV) was also associated with greater odds for alcohol use among adolescent SMM [40]. Generalized anxiety disorder, which has been associated with trauma [41–43], also predicted weekly alcohol consumption among college-age SMW [44]. Findings related to felt stigma (e.g., internalized homophobia, concealment, rejection sensitivity) and alcohol use were more mixed, particularly for adolescent SMM [26, 45].

Several factors were protective against risky alcohol use, including higher educational attainment [46], school engagement [47], and earlier SMY self-identification [48]. Adaptive personality traits (e.g., being ambitious, open to new experiences, less narcissistic) mitigated the adverse relationship between discrimination and alcohol misuse among SMY [49]. At least one study [38] found that connection to the sexual minority community was protective, while other studies either only found this association among a subset of SMY (e.g., gay-identified youth) or found no association at all [50, 51, 45, 52]. This inconsistency in findings may be partially explained by differences in peer group drinking norms [50, 53]. Parental attachment moderated the relationship between bisexual identity and HED risk in at least one study [10]. Finally, SMY-affirming structural factors (i.e., school-based Gay-Straight Alliances and anti-bullying policies) played a protective role and were associated with lower alcohol consumption among both SMY and heterosexual youth [31, 54, 55].

Drug Use Findings: SMY—Drug-related studies (n=66; 68.0%) similarly focused on individual-level risk and protective factors from a minority stress point of view. Enacted stigma predicted increased cocaine, methamphetamine, heroin, injection drug [24], and cannabis [56] use among SMY, and stimulant misuse among adolescent SMM [28]. Physical victimization and bullying were important risk factors [24, 25, 57]. For example, anti-SMY bullying predicted increased risk for anabolic steroid use among adolescent SMM [58], a group already at greater risk for steroid use than heterosexual adolescents [59]. Ioerger et al [60] also found that gender-variance-based victimization was associated with “other” drug use among both cisgender SMY and cisgender heterosexual adolescents, when controlling for sexual attraction. IPV had a more complicated relationship with drug use. Two studies [61, 62] found no association. However, Stults et al. [40] found that IPV victimization and perpetration were associated with significantly greater odds of cannabis, stimulant, and other drug use among adolescent SMM. Further, the longer-term sequelae of victimization may

predict substance use; adolescent SMW with higher levels of PTSD symptoms reported more frequent cannabis use than adolescent girls with lower-level symptomatology [63].

Felt stigma was also associated with drug use. Perceived homophobia predicted significantly higher levels of overall drug use [39] and club drug dependence among SMY [64] and opioid/sedative misuse among adolescent SMM [28]. In contrast and counter-intuitively, one study [64] found that internalized homophobia was associated with less club drug use among SMY.

Several factors were protective against SMY drug use including higher socioeconomic status [65], school connectedness [66], and higher self-esteem [67]. In fact, school enrollment itself predicted less past-3-month drug use in a predominantly Black and Latino SMY sample [68]. At the individual level, Wang et al [69] found that inhaled nitrite (poppers) use was inversely related to Health Belief Model [70] constructs of perceived drug-use severity and perceived self-efficacy and directly related to perceived barriers to reducing use among Chinese young SMM. Parental attachment moderated cannabis risk among bisexual youth [10] and was associated with reduced overall drug use among Chinese young SMM involved in sex work [71]. In contrast, SMY community connectedness did not mitigate general drug use disparities [50, 51, 72, 52, 45], possibly due to differences in peer drug use norms [51]. Finally, policies at the state (e.g., employment non-discrimination; marriage equality) and school levels (e.g., anti-bullying) were associated with lower rates of both general drug and cannabis use [27], and drug-related consequences [31].

Substance Use among Gender Minority Youth (GMY): A Gap in the Literature

Only nine articles (9.3%) presented findings specific to GMY and these focused primarily on individual-level minority stressors. Enacted stigma was associated with overall substance use. For example, healthcare discrimination was related to greater levels of alcohol and drug use among transmasculine youth (assigned female at birth and identify on a masculine-spectrum) [73]. Bullying also partially explained higher rates of alcohol and drug use [74]. Among transfeminine youth (assigned male at birth and identify on a feminine-spectrum), experiences of gender-related discrimination increased the odds of alcohol use compared to transfeminine youth without such experiences [75]; sexual-minority transfeminine youth showed even higher odds of HED than heterosexual transfeminine youth [76]. Internalizing symptoms and felt stigma were also related to alcohol and drug use among GMY. In particular, GMY were more likely than cisgender peers to report drinking alcohol to mitigate stress or interpersonal problems [77]. Additionally, psychological problems, gender-related discrimination, and parental alcohol/drug problems were associated with elevated odds of drug use among transfeminine youth [75]. No studies examined protective factors among GMY.

Substance Use among Adolescent (High-School Age) SMY: A Subset of the Literature

Thirty-seven articles (38.1%) presented data specifically related to adolescent, or high-school age, SMY. Unfortunately, none focused on adolescent GMY. Adolescent SMY are distinct from older youth in that they are typically enrolled full-time in secondary (high) school, reside with adult caregivers, and are legally prohibited from purchasing alcohol in

the US. This developmental period is also when many SMY begin questioning their sexual identity [6].

General Substance Use Findings—Among adolescent SMY, substance use was associated with psychological distress [14] and discrimination based on sexual orientation [78], race [78], or weight [32]. Related to these findings, cisgender adolescent SMM who reported being reprimanded in childhood for gender nonconforming behavior were more likely to report alcohol and cannabis use as well as depressive and anxiety symptoms [79]. Additionally, compared to heterosexual peers, adolescent SMY reported greater overall substance use among their peers and more permissive peer attitudes toward substance use [51]. Both factors mediated the relationship between sexual-minority status and lifetime substance use.

Alcohol Use Findings: Adolescent SMY—Alcohol use was frequently studied in this sub-set of SMY. Earlier SMY self-identification was associated with lower rates of adult HED [48], whereas more frequent changes in self-reported sexual orientation on longitudinal follow-up during this adolescent-young adult period were associated with higher rates of HED among adolescent SMM [80]. Subjective reasons for drinking also played an important role. For example, adolescent SMM who cited stress reduction as a primary drinking motive reported more frequent past-month alcohol use than those who drank for other reasons [81]. Findings related to enacted-stigma in this age group were more mixed, with some studies finding an association [32, 24, 25, 39, 82, 36] and others failing to do so [52, 83]. Additionally, findings indicated that bullying may indirectly predict alcohol use via its association with depression [83], which itself predicted adolescent SMY alcohol use [25, 84].

Some individual, interpersonal, and structural factors were protective against alcohol use among adolescent SMY. At the individual level, use of harm reduction strategies (e.g., not drinking when driving or engaging in sexual activity) was associated with reduced risk of alcohol-related consequences [85]. Social support was also an important protective factor, with perceived parental support predicting lower risk of HED (particularly among adolescent SMW) [86] and peer support being particularly protective for bisexual adolescents [52]. However, these associations were moderated by peer alcohol use norms in one study [50]. School connectedness and overall social support were also associated with lower rates of heavy drinking during high school [66] and adulthood [47]. Finally, the environment in which adolescent SMY learn may impact drinking. Attending an SMY-affirming school was associated with significantly fewer heavy drinking days [55] as well as lower odds of risky drinking and past-year alcohol consequences, both for adolescent SMY generally and in particular for adolescent SMW [54, 31]. However, Coulter et al [55] did not find school climate to be protective for bisexual or questioning youth.

Drug Use Findings: Adolescent SMY—Drug-use studies among adolescent SMY also focused on minority stress factors. Bullying [25, 57, 58, 24], perceived homophobia [39], low self-esteem [67], gender-expression-based discrimination [60], stigmatizing school policies [27], and lack of Gay-Straight Alliances [87] were associated with higher drug use. Cannabis, cocaine, methamphetamine, opioid, prescription medication, and injection drug

use were associated with perceived school safety [24], bullying [25], sexual violence victimization [24], and neighborhood-level rates of anti-SGM hate crimes [56]. Depressive symptoms were associated with both cannabis [25] and anabolic steroid use [58]. Suicidal ideation, physical victimization, and past-month drug use were also associated with anabolic steroid use [58]. Finally, greater sexual orientation fluidity during adolescence [80] and experiencing racial discrimination [78] predicted higher rates of cannabis use. Other demographic factors such as unstable housing and lack of enrollment in school were associated with concurrent use of multiple drugs [88].

Drug-use protective factors were similar to those for alcohol use and included school connectedness and social support. Both were protective against past-month cannabis, inhalant, and non-prescribed pain medication use [66]. Although adolescent SMY with an adult mentor were less likely than other SMY to report cannabis and non-cannabis drug use [89], they were still more likely than heterosexual youth to have used drugs. Additionally, Pearson et al [86] found that higher levels of parental closeness were associated with greater drug use among adolescent SMM; an association that was not present among adolescent SMW.

Racial/Ethnic Similarities and Differences among SMY

Fewer studies (n=20; 20.6%) compared differences in substance use by race/ethnicity among SMY; no studies focused on racial/ethnic differences among GMY. Existing studies tended to dichotomously compare White SMY and racial/ethnic minority SMY and focused on risk factors (rather than protective factors). Swann et al [90] observed racial/ethnic differences among young SMM in the trajectory of substance use over the adolescent and young adulthood period. Black young SMM reported slower increases in alcohol, cannabis, and non-cannabis drugs, compared to White young SMM. In contrast, Latino young SMM reported steeper increases in alcohol use but slower increases in poly-drug use (3 or more substances). Black and Latino adolescent SMM were also more likely than Whites to report lifetime anabolic steroid use [59], a disparity that was associated with depressive symptomatology [58]. Asian young SMM reported decreasing rates of inhalant use over time, a finding not observed in other racial/ethnic groups [65]. Among Black SMY, race-based discrimination was also associated with adolescent HED and cannabis use [78]. Black SMY with higher levels of life stress had higher odds of past-year cannabis, cocaine, and prescription opioid use [91]. In contrast, school enrollment was associated with less drug use among Black SMY [68]. Compared to Whites, racial/ethnic minority adolescent SMY also reported disproportionately high rates of stigma [92], physical threats/victimization, and feeling unsafe at school [28]. Each of these was associated with greater risk of substance use [78, 58, 24, 36, 39]. Findings for Asian adolescent SMY showed a particularly strong association between victimization and substance use [36], compared to other racial/ethnic minority SMY.

Sex-Specific Findings among SMY: An Understudied Area

Thirty-two studies (33%) reported sex-specific findings. Minority stress was the most common theoretical framework used in these studies. In particular, violence (enacted stigma) was a major area of sex-specific inquiry. For example, peer victimization was more strongly

associated with substance use among young SMW than among young SMM [36]. Researchers found higher rates of verbal aggression among female same-sex couples than different-sex couples; however, verbal aggression was not associated with HED or cannabis use [61]. Adolescent SMW were more likely than their age-matched heterosexual counterparts to report cyber and school-based peer bullying [37, 24], experiences that were associated with alcohol and drug use [25, 84, 57, 58, 24]. Bullying was a particularly strong predictor of risky alcohol use among bisexual youth, a finding that was not consistently found for other SGMY sub-groups [37]. Across a number of studies, felt stigma was also associated with substance use, but adolescent SMW reported significantly higher levels of felt stigma than adolescent SMM [64]. Interestingly, coping with such stressors was more commonly cited by adolescent SMM than adolescent SMW as a primary reason for alcohol use [81]. Regarding social and structural factors, young SMW college athletes were more likely than female heterosexual athletes to report prescription and non-prescription drug use; however, athletic participation was only associated with non-prescription drug use among young SMM [93]. School-based Gay-Straight Alliances and anti-bullying policies, while protective for all adolescent SMY, were most protective against risky alcohol use and substance-use-related consequences for adolescent SMW [31]. Finally, there may also be sex differences in how previous substance use predicts current substance use among SMY. For example, in a study comparing SMY to same-sex heterosexual peers, adolescent tobacco use was predictive of young adult substance use among young SMW. In contrast, adolescent alcohol use was a stronger antecedent for adolescent heterosexual and bisexual SMM [94].

CONCLUSIONS

As evidenced by the number of research reports included in our review, there is growing interest in risk and protective factors associated with substance use among SGMY. However, substantially more attention has been given to risk rather than protective factors. Despite difficulties in comparing findings across studies because of variations in how substance use and SGMY status were operationalized, findings suggest that SGMY experience discrimination, bullying, and violence at higher rates than heterosexual youth, and the preponderance of studies found evidence of positive, small-to-medium strength associations between these experiences and substance use. However, it is difficult to make cross-study comparisons because analytic methods, outcome measures, and adjustment for confounding variables varied widely among studies. Additionally, findings suggest that individual coping strategies and institutional policies/programs that promote acceptance of SGMY youth can protect against risky substance use. Peer and parental support also partially mitigated risk of alcohol and drug use among some SGMY, and such support has also been shown to protect against other negative outcomes such as suicidal ideation [95]. Although more research is needed to better understand factors that protect against risk and promote resilience among SGMY, particularly GMY, findings highlight the need for intervention efforts aimed at preventing discrimination and victimization and equipping SGMY youth with tools for coping with these experiences when they occur.

There were several noteworthy methodologic trends observed in the review. First, the majority of SMY-focused studies and all GMY-focused studies used a cross-sectional design or only presented cross-sectional findings from longitudinal studies; far fewer followed

youth longitudinally. Although such studies provide valuable insights into substance use among SGMY, they are unable to draw conclusions about causality. Additionally, most studies used volunteer or convenience samples, which limits generalizability. While convenience sampling can provide in-depth information about a particular group of SGMY [96], these types of studies are subject to selection bias such that SGMY who participate are more likely to be open about and comfortable with their SGMY status [97]. Because of the challenges involved in obtaining representative samples of SGMY, many researchers rely on national probability samples to overcome the limitations of convenience sampling. Therefore, it is important that measures of sexual orientation and gender identity be administered confidentially and included in all nationally representative studies (contrary to recent US Department of Health and Human Services proposals to remove such survey items [98, 99]).

The use of varying sexual orientation and gender identity measures limited our ability to compare results across studies. Most studies classified SGMY based on sexual identity and did not take into account sexual attraction. Sexual attraction is particularly relevant when studying SGMY because it allows researchers to identify youth whose sexual identity may not be stable or who may not yet be sexually active [100]. Few studies included assessment of youth who were “questioning” or otherwise unsure of their sexual orientation; those that did found this group to be at particular risk. Additionally, several studies cited sample size concerns to justify combining all SGMY into a single category, thereby increasing statistical power but obscuring within-group differences. Similarly, when gender identity was assessed, SGMY were often either dropped from the analysis or combined with SGMY. Studies that reported SGMY-specific findings tended to use only self-reported gender identity rather than the recommended operational definition based on a combination of current gender identity and sex assigned at birth [101]. When possible, data from SGMY should be examined separately from SGMY to understand variations in risk and resilience in these groups.

Measures of alcohol and drug use also varied substantially across studies. Some focused simply on use (over a variety of time-periods) while others examined risk (e.g., HED or use-related consequences). Such variation limited cross-study comparisons. All studies relied on self-report, which is subject to recall and social desirability bias. Triangulating self-report with objective measures (e.g., urine toxicology) could improve reliability. Additionally, certain measures may be more appropriate for certain sub-groups of SGMY than others. For example, “lifetime use” might be appropriate for adolescent SGMY but less clinically meaningful in college-age youth, when overall use is more common and when risky use and use-related consequences are of particular interest. Developing accepted measurement standards for alcohol and drug use in this population could alleviate some of this variability and permit more accurate cross-study comparisons and meta-analyses.

Aside from Wang et al [69], most studies focused on minority stressors (e.g., discrimination, stigma, prejudice) or related concepts (e.g., victimization) as risk factors. In part, this is appropriate because research has linked minority stress to myriad SGMY health disparities [23]. However, additional research is needed to investigate other theoretical models (e.g., Theory of Gender and Power [102], Health Belief Model [70]) and factors that are likely associated with substance use among SGMY (e.g., gender dysphoria, access to health care,

gender-affirming medical/surgical interventions). Information is also needed about factors (e.g., discrimination) that are associated with substance use treatment acceptability and engagement among SGMY.

Finally, few of the recent studies investigated racial/ethnic, sex, or sexual orientation differences in risk/protective factors despite earlier findings that suggest important differences. Improved understanding of how such demographic factors interact to affect risk could support the development of tailored interventions that target SGMY at highest risk. For example, Swann et al [90] found that increases in substance use during adolescence and young adulthood occurred more slowly among Black young SMM compared to White young SMM. It is conceivable that such findings could lead to treatment interventions that attempt to harness and lengthen this lag period. It is important that researchers strive to increase racial/ethnic diversity of samples and to include both young SMM and SMW. Equally important, research is needed to investigate potential racial/ethnic and sex/gender differences, rather than simply controlling for these demographic variables.

Limitations of this scoping review include restriction of the sample to peer-reviewed articles published between 2013–2017 and omitting so-called “gray-literature” (e.g., doctoral dissertations, practice guidelines, government reports). We also omitted articles in which the samples included youth under 25 but which did not conduct age comparisons to support distinct youth-focused conclusions. The authors are also all US-based and therefore our inclusion/exclusion criteria may not fully reflect the research priorities or cultural contexts of substance use in other locations. Although we did not specifically exclude research conducted outside the US, many non-US-based articles were excluded because they focused solely on prevalence or involved populations defined by HIV/STI risk. Our restriction to non-HIV/STI-focused risk and protective factor research was intentional. Prevalence studies and HIV/STI-defined populations make up the bulk of research in this area [21], and narrowing our focus allowed us to comment on and draw attention to other segments of the literature. Understanding general risk and protective factors for substance use among SGMY is a necessary prerequisite for developing targeted or tailored treatment interventions.

Our results highlight the field’s interest in risk and protective factors for substance use among SGMY—and the particular focus on minority stress as an important risk factor. Results also highlight important methodologic and theoretical limitations in the currently available literature. Future directions include continued examination of SGMY substance use in nationally representative samples; expanded inquiry among GMY; further examination of racial/ethnic and sex/gender differences among SGMY; improved standardization of sexual orientation, gender identity, and alcohol/drug use measures; and increased efforts to translate what is known about alcohol and drug use among SGMY into clinical and public health interventions that address the well-documented substance use disparities in this at-risk population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Abbreviations

GMY	gender minority youth
HED	heavy episodic drinking
IPV	intimate partner violence
PTSD	post-traumatic stress disorder
SGMY	sexual and gender minority youth
SMM	sexual minority men
SMW	sexual minority women
SMY	sexual minority youth
US	United States
YRBSS	Youth Risk Behavior Surveillance System

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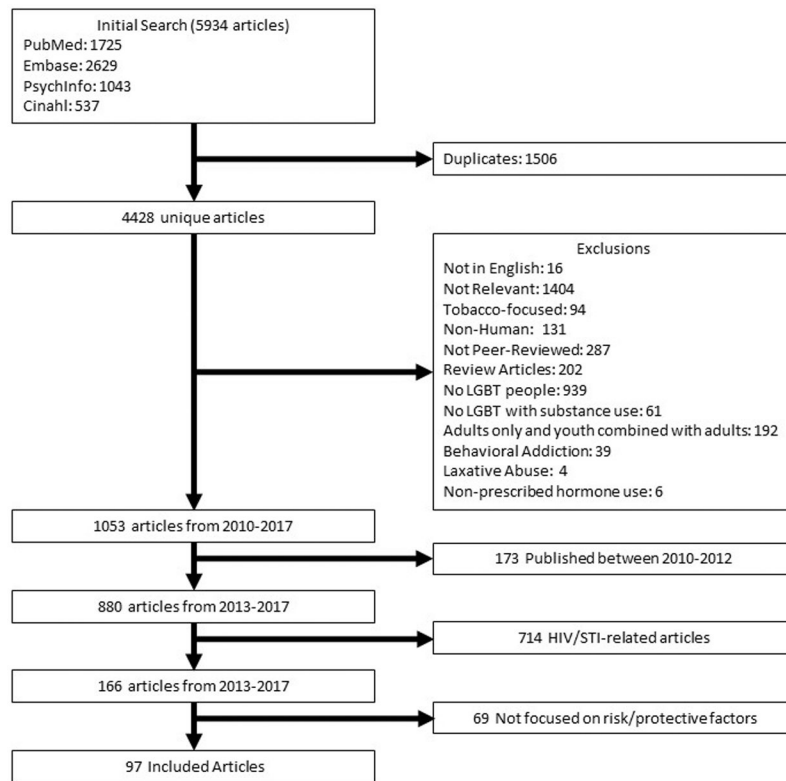


Figure 1. Literature search and article screening process.

Table 1.

Study design, sample characteristics, and measures of sexual orientation and gender identity in the 97 articles reviewed.

STUDY DESIGN AND SAMPLE CHARACTERISTICS	
Category	# of Articles (% of total n=97)
Sample ^a	
<i>Representative/Population-Based</i>	29 (29.9)
<i>Convenience</i>	63 (64.9)
<i>Other</i>	8 (8.2)
Study Design	
<i>Cross-sectional</i>	75 (77.3)
<i>Longitudinal</i>	21 (21.6)
<i>Other</i>	1 (1.0)
Separated findings by sex/gender	
<i>Young SMM</i>	36 (37.1)
<i>Young SMW</i>	22 (22.7)
<i>Transfeminine GMY</i>	5 (5.1)
<i>Transfeminine GMY</i>	2 (2.1)
Examined differences among SGMY by sex/gender	32 (33.0)
Examined difference among SGMY by race/ethnicity	20 (20.6)
Non-US based	14 (14.4)
Included findings for adolescent (high-school age) groups	37 (38.1)
SEXUAL ORIENTATION & GENDER IDENTITY MEASURES	
Category	# of Articles (% of total n=97)
Domains of sexual orientation ^a	
<i>Sexual identity</i>	75 (77.3)
<i>Sexual attraction</i>	22 (22.7)
<i>Sexual behavior</i>	30 (30.9)
Assessed gender identity	23 (23.7)
Assessed gender identity using both current identity and sex-assigned-at-birth	5 (5.1)
Combined all SMY in the analysis (e.g., LGB)	51 (52.6)
Combined all SGMY in the analysis (e.g., LGBT)	10 (10.3)
Examined differences by SMY identity (e.g., lesbian vs gay vs bisexual)	31 (31.9)
Presented risk/protective factors separately for GMY	9 (9.3)
Single sex/gender samples	41 (42.3)
Included a heterosexual (vs SMY) or cisgender (vs GMY) comparison group	46 (47.4)

^aSome studies used more than one sampling strategy or measured multiple domains of sexual orientation, therefore column frequencies and percentages do not add up to 97 or 100%, respectively.

Table 2.

Alcohol and drug use measures in the 97 studies included in the scoping review.

ALCOHOL USE (n=77; 79.4% of articles reviewed)					
Category	# articles (% total alcohol articles n=77)				
Time-frame of frequency measure					
<i>Lifetime</i>	7 (9.1)				
<i>Past-year</i>	23 (29.9)				
<i>Past 30-days</i>	28 (36.4)				
<i>Other</i>	34 (44.1)				
Type of alcohol use assessed					
<i>Heavy episodic drinking</i>	37 (48.0)				
<i>Risky drinking (NIAAA criteria* or validated measure)</i>	20 (26.0)				
<i>Alcohol-related consequences</i>	14 (18.2)				
<i>DSM-IV alcohol use disorder</i>	1 (1.3)				
Method for measuring use					
<i>Self-report</i>	77 (100)				
<i>Other</i>	0				
DRUG USE (n=66; 68.0% of articles reviewed)					
Category	(# Articles; % total drug articles n=66)	Time Frame Assessed (# Articles)			
		Lifetime	Past-Year	Past 30-days	Other
<i>Drug use</i>	19 (28.8)	4	4	3	8
<i>Non-cannabis drug use</i>	16 (24.2)	4	4	3	5
<i>Cannabis</i>	37 (56.1)	3	8	14	12
<i>Cocaine (crack or powder)</i>	15 (22.7)	6	3	3	3
<i>Benzodiazepines</i>	5 (7.6)	3	0	0	2
<i>Amphetamines/Methamphetamine</i>	14 (21.2)	7	4	1	2
<i>MDMA/GHB/Ketamine</i>	12 (18.2)	5	2	2	3
<i>Hallucinogens</i>	6 (9.1)	2	2	1	1
<i>Inhalants (including poppers)</i>	8 (12.1)	4	1	2	1
<i>Opioids (heroin, oxycodone, etc)</i>	12 (18.2)	7	3	0	2
<i>General prescription drug misuse</i>	18 (27.3)	3	3	3	9
<i>Anabolic steroids</i>	5 (7.6)	4	0	0	1
Method for assessing drug use	# of articles (% of total drug articles n=66)				
Self-report measure	66 (100)				
Other	0 (0)				

Note: Column percentages do not add to 100% because some studies used more than one time-frame or measured more than one drug.

* NIAAA Risky Drinking Criteria: For men, more than four drinks in a single day or more than 14 in a week. For women, more than three drinks in a single day or more than six in a week.