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Sex While Intoxicated: A Meta-Analysis Comparing Heterosexual and Sexual Minority Youth

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Abstract

Background—The social marginalization and victimization experienced by sexual minority youth (SMY) may lead to increased risk behaviors and higher rates of negative health outcomes compared with their heterosexual peers.

Methods—We conducted a meta-analysis to examine whether SMY reported higher rates of sex while intoxicated. Studies that report rates of substance use during sex in both SMY and heterosexual youth and had a mean participant age of 18 or less were included in our meta-analysis. Effect sizes were extracted from six studies (nine independent data sets and 24 effect sizes) that met study criteria and had high inter-rater reliability (.98).

Results—Results indicated that SMY were almost twice as likely to report sex while intoxicated as compared with heterosexual peers. A random-effects meta-analysis showed a moderate ([overall weighted effect OR]= 1.91, $p < .0001$) weighted effect size for the relationship between sexual orientation and the use of drugs at the time of sexual intercourse, with the mean effect size for each study ranging from 1.21 to 3.50 and individual effect sizes ranging from .35 to 9.86.

Discussion—Our findings highlight the need for healthcare providers to screen SMY for participation in substance use during sexual intercourse and to offer risk reduction counseling during office visits.

Keywords

LGBT health; Adolescent health; Health disparities; Adolescent sexual health

Sexual minority youth (SMY) are youth who experience same-sex sexual attraction, identity, and/or behavior. Although SMY are a diverse group, their shared minority status universally places them at greater risk for victimization and social marginalization than heterosexual youth [1–3]. Jessor and Jessor's Problem-Behavior Theory (PBT) suggests that this hostile

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context may contribute to health-compromising behaviors that lead to disparities in health [4].

One disparity that SMY face is higher rates of negative sexual health outcomes (e.g., STIs, HIV, and unintended pregnancies) [1,5,6], which may be because of higher rates of health-compromising behavior such as sex while under the influence of drugs and alcohol [7]. Understanding the relationship between sexual orientation and sex while intoxicated may explain the sexual health disparities among SMY. The goal of this meta-analysis was to aggregate and summarize current published data to determine whether SMY are more likely than heterosexual youth to report having sex while intoxicated.

Methods

CDC reporting guidelines were followed closely for this meta-analysis [8]. To be included, studies had to meet two criteria: (1) report rates of substance use during sex in both SMY and heterosexual youth or an effect size estimating the relationship between the two; and (2) the mean age of the sample was ≥18, and the upper bound of the range was not more than 21 years. First, we conducted a systematic search of two databases (PsychInfo, MedLine) using combinations of key terms including “risky sex,” “substance use,” “lesbian,” “bisexual,” “youth,” and more. The search yielded 2,734 abstracts that were considered for inclusion. Second, articles that appeared to meet our criteria were reviewed to confirm eligibility (n = 183). Third, all the eligible studies were read in detail and citation lists were reviewed to identify studies not identified by the database search. Using these methods, six studies were identified. The majority of articles that were excluded in step 1 through step 3 were excluded either for (1) not having a comparison by sexual orientation (i.e., containing only SMY but not heterosexual youth), or (2) reporting sexual practices or substance use, but not the co-occurrence of the two. Pertinent effect-size data were extracted by two co-authors. These data were continuous; thus, inter-rater agreement was measured using an intra-class correlation coefficient, which was high (.98). Disagreements and coding errors were resolved before analyses. Diagnostic procedures were performed to identify potential outliers, publication biases, and other threats to the validity of our statistical conclusions [9]. Data management and analyses were conducted using NIH-sponsored software [10].

Results

The six identified studies (Table 1) [1–3,5,6,11] included nine independent data sets and 24 effect size estimates (Figure 1). A random-effects meta-analysis [9] found a moderate relationship between sexual orientation and sex while intoxicated (OR = 1.91, $z = 5.68$, $p < .0001$). The mean effect sizes for each study ranged from 1.21 [1] to 3.50 [6]. Individual effect sizes ranged from .35 [1] to 9.86 [6]. When the overall effect was recalculated with each study removed, the re-estimated effect sizes ranged from 1.77 to 2.08 (all p-values <. 0001). Begg and Mazumdar’s rank correlation test ($p = .27$) and Egger’s linear regression test ($p = .17$) indicated no significant relationship between the standard errors and the effect sizes. Rosenthal’s Fail-safe N test suggests that 641 missing studies with null effects would be needed to increase the overall p value more than .05 and show no effect.

Discussion

Results of this meta-analysis indicated that SMY were almost twice as likely to report sex while intoxicated compared with their heterosexual peers. The co-occurrence of substance use and sexual behaviors may help explain sexual health disparities among SMY, and on the basis of PBT, may be a marker for other short- and long-term psychosocial health problems and disparities [4].

Although this meta-analysis suggested that SMY are more likely to have sex under the influence, it cannot address the question of why these behaviors were more likely to occur. It may be, in part, a response to the victimization and marginalization that SMY face on a daily basis through both overt homophobia (such as bullying and name calling) and institutionalized heterosexism (such as anti-gay marriage amendments). Victimization and marginalization make SMY more vulnerable to substance use, self-harm, sensation seeking, and the need to disassociate as they become sexually active, which may all lead to elevated rates of sex while intoxicated [12].

Some limitations warrant caution when drawing conclusions from these data. First, there was variability across the studies in measurement of the variables, time periods of recall, and sampling methods (population versus convenience). Although our analyses showed that these substantive and methodological variables did not moderate the effect, more studies are needed to adequately test moderation and fully explain the heterogeneity across studies. The statistical trend suggesting that convenience samples might yield a larger overall effect size (reported in Table 1) suggests that caution is warranted when generalizing the effects from studies that use convenience samples. Because we were only able to synthesize the data presented in the identified articles, we were not able to look at the effect of demographic factors such as age, race, or socioeconomics—all factors that may affect sexual and substance use behaviors. However, we did examine gender of participant, bisexuality status, and the operationalization of sexual orientation (behavior vs. identity) as moderators, and none were significant. Finally, we were only able to identify six studies that examined these behaviors in samples that included both SMY and heterosexual youth, suggesting a need for further study of risk behaviors in at-risk populations.

The American Academy of Pediatrics identifies substance use and sexual health risk reduction as priority issues for adolescent preventive care visits [13]. Our results suggest that screening SMY for co-occurring substance use and sexual behavior could help health care providers appropriately tailor risk-reduction counseling during office visits. Ongoing research is needed to identify the forces that drive higher rates of intoxicated sex among SMY. Improved understanding of this behavior would inform effective interventions to prevent the resulting disproportionate negative sexual health outcomes.

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References

1. Saewyc EM, Poon CS, Homma Y, et al. Stigma management? The links between enacted stigma and teen pregnancy trends among gay, lesbian, and bisexual students in British Columbia. Can J Hum Sex. 2008; 17:123–139. [PubMed: 19293941]
2. Garofalo R, Wolf RC, Kessel S, et al. The association between health risk behaviors and sexual orientation among a school-based sample of adolescents. Pediatrics. 1998; 101:895–902. [PubMed: 9565422]
3. Ciro D, Surko M, Bhandarkar K, et al. Lesbian, gay, bisexual, sexual-orientation questioning adolescents seeking mental health services: Risk factors, worries, and desire to talk about them. Soc Work Ment Health. 2005; 3:213–234.
4. Jessor, R.; Donovan, JE.; Costa, FM. Beyond adolescence: Problem behavior and young adult development. Cambridge, United Kingdom: Cambridge University Press; 1991.

5. Goodenow C, Szalacha LA, Robin LE, et al. Dimensions of sexual orientation and HIV-related risk among adolescent females: Evidence from a statewide survey. Am J Public Health. 2008; 98:1051–1058. [PubMed: 18445809]

6. Moon MW, McFarland W, Kellogg T, et al. HIV risk behavior of runaway youth in San Francisco: Age of onset and relation to sexual orientation. Youth Soc. 2000; 32:184–201.

7. Koblin BA, Husnik MJ, Colfax G, et al. Risk factors for HIV infection among men who have sex with men. AIDS. 2006; 20:731–739. [PubMed: 16514304]

8. Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: A proposal for reporting. Meta-analysis of Observational Studies in Epidemiology (MOOSE) group. JAMA. 2000; 283:2008–2012. [PubMed: 10789670]

9. Borenstein, M. Introduction to meta-analysis. Chichester, United Kingdom: John Wiley & Sons; 2009.

10. Borenstein, M.; Hedges, L.; Higgins, J., et al. Comprehensive meta-analysis Version 2. Englewood, NJ: Biostat; 2005.

11. Goodenow C, Netherland J, Szalacha L. AIDS-related risk among adolescent males who have sex with males, females, or both: Evidence from a statewide survey. Am J Public Health. 2002; 92:203–10. [PubMed: 11818292]

12. Stall, R.; Friedman, M.; Catania, J. Interacting epidemics and gay men's health: A theory of syndemic production among urban gay men. In: Richard, JW.; Ron, S.; Ronald, OV., editors. Unequal Opportunity: Health Disparities Affecting Gay and Bisexual Men in the United States. New York, NY: Oxford University Press; 2007. p. 251

13. Hagan, JF.; Shaw, JS.; Duncan, PM. Bright futures: Guidelines for health supervision of infants, children, and adolescents. 3rd edition. Elk Grove Village, IL: American Academy of Pediatrics; 2008.

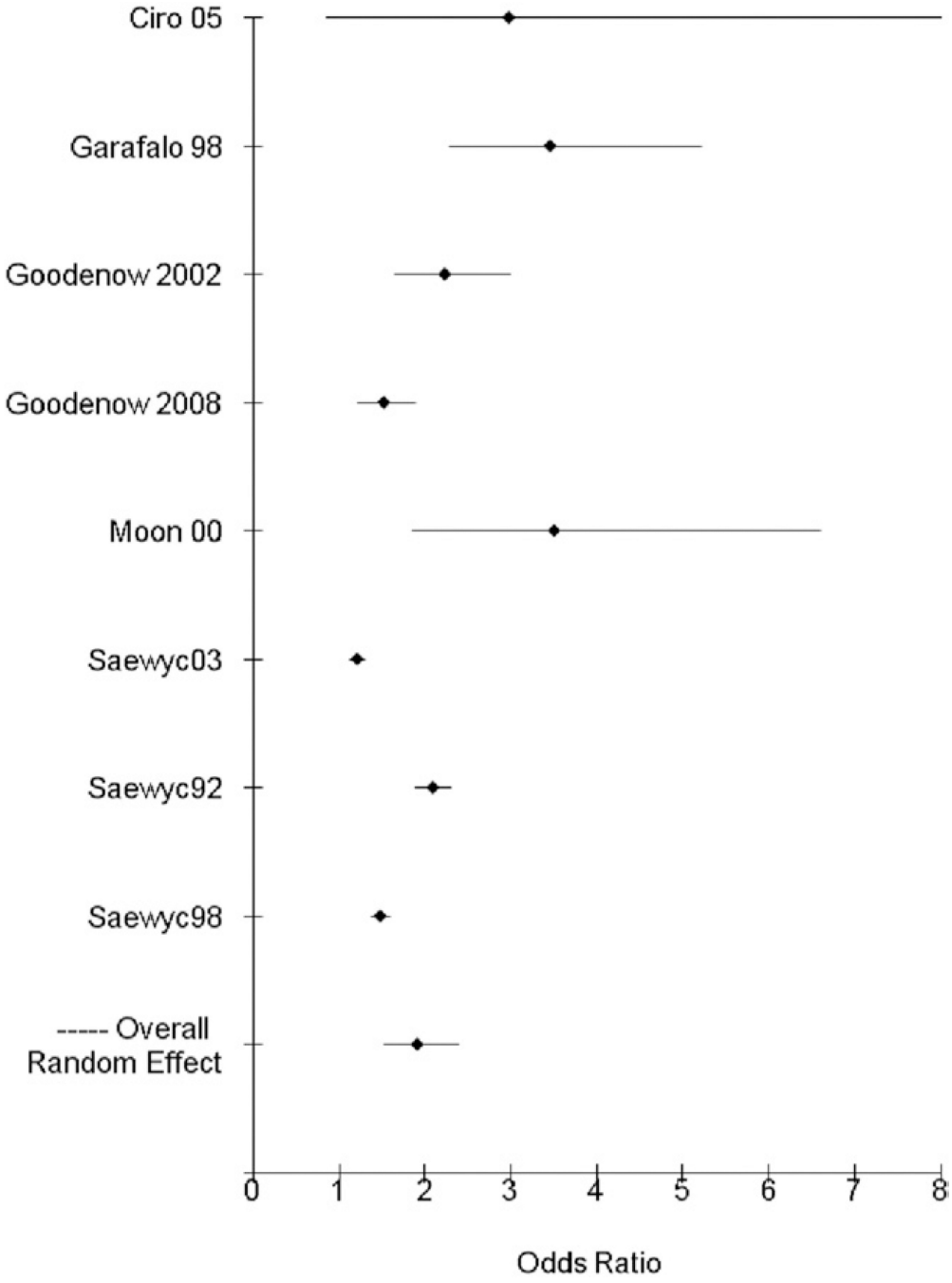

Figure 1.
Odds ratios and 95% confidence intervals for studies testing the association between sexual orientation and adolescent reports of drug use during sex.

Table 1

Description of included studies

Article	Sample groups (N)	Reported sample demographics	Survey/sampling	Measurement of IV	Outcome variable	Group comparisons (first group listed is reference group)	OR
Ciro et al., 2005	Total N = 712 1. Straight (650) 2. Lesbian/Gay (37) 3. Bisexual (25)	Demographics not presented in the original article	Clinic based sample of youth presenting for mental health services	Self reported identity	Used drugs to make sex better	1 vs. 2 1 vs. 3	1.84(.40–8.55) 4.79(1.98-11.57)
Garofalo et al., 1998	Total N = 3,556 1. Heterosexual (3,452) 2. Gay/Lesbian/ Bisexual (104)	Race (%) White, not Hispanic (72) Black, not Hispanic (8) Hispanic or Latino (9) Asian/Pacific Islander (5) Native American (1) Other (05) Modal age = 16 years	1995 Massachusetts Youth Risk Behavior Surveillance Survey —Population based survey of High school students	Self reported identity	Alcohol or drugs used at last sexual episode	1 vs. 2	3.45(2.28–5.22)
Goodenow et al., 2002	Total N = 3,267 1. Partners of opposite sex only (3,065) 2. Partners of same sex only (94) 3. Partners of both sexes (108)	Race (%) White (68) Black (09) Hispanic (12) Asian (04) Other/mixed (06) Modal age = 17 years	Men from 95, 97 and 99 Massachusetts Youth Risk Behavior Surveillance Survey —Population based survey of High school students	Behavior (i.e., sex with men, women or both)	Alcohol/drugs used most recent intercourse	1 vs. 2 1 vs. 3	.99(.622–1.58) 3.98(2.69–5.88)
Goodenow et al., 2008	Total N = 3,963 1. Heterosexual (3,666) 2. Lesbian or Gay (21) 3. Bisexual (163) 4. Partners of opposite sex only(3,706) 5. Partners of same sex only (79) 6. Partners of both sexes (178)	Race (%) White (75) Black (07) Hispanic (09) Asian (03) Other/mixed (06) Mean age = 16.3 years	Women from 95, 97, 99 and 01 Massachusetts Youth Risk Behavior Surveillance Survey —Population based survey of High school students	Separate analyses for self reported identity and behavior	Alcohol/drugs used last sexual intercourse	1 vs. 2/3 4 vs. 5 4 vs. 6	1.39(.98–1.97) 1.36(.80–2.32) 1.73(1.23–2.42)
Moon et al., 2000	Total N = 334 1. Heterosexual male (91) 2. Gay/bisexual male (33) 3. Heterosexual female (175) 4. Lesbian/bisexual female (35)	Race (%) White (44) African American (18) Latino (26) Asian/Pacific Islander (12) Mean age = 17.4 years	The Homeless and Runaway Youth Survey. Clinic based sample of youth presenting for services at youth facilities in San Francisco	Self Identified sexual orientation	Sex while high in the past 6 months Was high during last sexual encounter	3 vs. 4 1 vs. 2 3 vs. 4 1 vs. 2	9.86(3.34–29.14) 2.39(1.00–5.70) 4.22(1.89–9.46) 1.95(.85–4.46)
Saewyc et al., 2008[a]	Total N = 738,480 1. Heterosexual men (361,478)	Demographics not presented the original article	92, 98 and 03 British Columbia Adolescent Health Surveys.	Self-labeling of attraction	Substance use before last intercourse	1 vs. 2 in 1992 survey	4.84 (3.93–5.97) 1.8 (1.56–2.07) 7.25 (4.52–11.63)

Article	Sample groups (N)	Reported sample demographics	Survey/sampling	Measurement of IV	Outcome variable	Group comparisons (first group listed is reference group)	OR
	2. Gay men (2,718) 3. Bisexual men (4,690) 4. Heterosexual women (359,242) 5. Gay/Lesbian women (1,087) 6. Bi women (9,265)		Cluster-stratified random survey of classroom students in grades 7 through 12 in BC			1 vs. 3 in 1992 survey 4 vs.5 in 1992 survey 4 vs. 6 in 1992 survey 1 vs. 2 in 1998 survey 1 vs. 3 in 1998 survey 4 vs. 5 in 1998 survey 4 vs. 6 in 1998 survey 1 vs. 2 in 2003 survey 1 vs. 3 in 2003 survey 4 vs. 5 in 2003 survey 4 vs. 6 in 2003 survey	1.13 (.94–1.36) 1.49 (1.27–1.75) 1.42 (1.21–1.67) .46 (.32–.66) 1.67 (1.50–1.87) .35 (.25–.49) 1.01 (.84–1.22) 1.05 (.70–1.57) 1.39 (1.27–1.52)

Analyses showed that gender, bisexuality status, and operationalization of sexual orientation (e.g., identity versus behavior) were not significant moderators of the association between sexual orientation and sex while intoxicated. A statistical trend ($p < .10$) suggested that sampling strategy may moderate the association such that the average OR for convenience samples (n = 2) was 3.35 (CI: 1.66–6.75) and the OR for population-based samples was 1.79 (CI: 1.43–2.25). The overall point estimate did not change when taking these potential group differences into account.

[a]N scaled and weighted to represent population. Because of the large Ns analyses were run without these effects to see if they had an effect on the overall odds ratios. Removal of these studies did not have a significant effect on the results.