Letters

RESEARCH LETTER

Suicide Risk Behaviors Among Sexual Minority Adolescents in the United States, 2015

Sexual minority (lesbian, gay, bisexual, or questioning) adolescents are believed to have elevated suicide risks.[1] Studies supporting this claim, however, rarely use nationally representative samples, which is a major limitation given that stigma and prevention resources vary across communities and may influence suicide risk behaviors.[2] When nationally representative studies are available, they are not recent.[3] Moreover, studies have ignored the diversity among sexual minorities, assuming all share the same risks.[4] We estimated suicide risk behaviors of sexual minority adolescents using nationally representative data from 2015.

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Methods | The 2015 National Youth Risk Behavior Survey uses a 3-stage, cluster sample of counties from all states, schools (including private schools) within counties, and classrooms within schools, yielding a nationally representative sample of high school students.[5] Students responded privately on computer-scannable questionnaires (response rate = 60%). The US Centers for Disease Control and Prevention institutional review board approved the survey, requiring parental consent and student assent. Secondary analysis of these public data was exempt from further review.

To assess suicide risk behaviors, participants were asked whether, in the past year, they had (1) seriously considered suicide, (2) planned suicide, or (3) attempted suicide. Suicide risk behaviors of sexual minority adolescents, including gay or lesbian, bisexual, or not sure (hereafter referred to as questioning), relative to heterosexuals were estimated using descriptive statistics and logistic regressions including plausible and commonly used controls for sex, age, race/ethnicity, English language proficiency, and grades. Effect estimates were calculated for sexual minorities as a group, across subgroups (gay, bisexual, questioning), and across sexes (eg, gay males). Relative risks were described as risk ratios holding confounders at their mean using random draws from the logistic regression variance covariance matrix.[6] Analyses were computed using the survey package for R (R Foundation), version 3.4.1, and a 2-sided α of .05.

Results | Participants (N = 15 624) reported their sexual orientation as heterosexual (overall, 88.8%; female population, 84.5%; male population, 93.1%), gay or lesbian (overall, 2.0%; female population, 2.0%; male population, 2.0%), bisexual (overall, 6.0%; female population, 9.8%; male population, 2.4%), or questioning (overall, 3.2%; female population, 3.7%; male population, 2.6%).

In the past year, seriously considering suicide was reported by 40% of sexual minority adolescents (95% CI, 36.4%-42.9%); planning suicide, 34.9% (95% CI, 31.1%-38.6%); and attempting suicide, 24.9% (95% CI, 21.5%-28.2%) compared with 14.8% of heterosexuals (95% CI, 13.7-15.9) seriously considering suicide; 11.9% (95% CI, 10.7-13.0) planning suicide; and 6.3% (95% CI, 5.5-7.2) attempting suicide (**Table**).

After adjusting for potential confounders, sexual minority adolescents were significantly more likely to consider, plan, or attempt suicide (risk ratio [RR]: 2.45 [95% CI, 2.12-2.81] for considering, 2.59 [95% CI, 2.18-3.04] for planning, and 3.37 [95% CI, 2.73-4.09] for attempting) than heterosexuals.

By subgroup, lesbian, gay, bisexual, and questioning adolescents were all at elevated risk for suicide relative to heterosexuals. For instance, bisexuals were more likely to consider (46.0% [95% CI, 41.5%-50.4%]; RR, 2.73 [95% CI, 2.32-3.18]), plan (40.8% [95% CI, 35.8%-45.8%]; RR, 2.85 [95% CI, 2.34-3.42]), or attempt (31.9% [95% CI, 27.7%-36.0%]; RR, 4.28 [95% CI, 3.34-5.35]) suicide than heterosexuals.

Differences persisted after stratifying by sex. Of lesbians, 40% (95% CI, 28.1%-52.2%) considered suicide vs 19.6% (95% CI, 17.7-21.6) of heterosexual females, and, of gay males, 25.5% (95% CI, 14.8%-36.1%) considered suicide vs 10.6% of heterosexual males [95% CI, 9.6%-11.7%]). Furthermore, the pattern held after controlling for confounders. For example, bisexual males (RR, 4.44 [95% CI, 2.88-6.15]) and bisexual females (RR, 2.27 [95% CI, 1.91-2.67]) were more likely to consider suicide than their heterosexual peers.

Discussion | Sexual minority adolescents were substantially more likely to report suicide risk behaviors.

This study is limited by the lack of data for suicide risks among transgender adolescents and a 60% response rate that may limit generalizability. Further study is also needed to understand the mechanisms underlying elevated suicide risk behaviors for sexual minority adolescents.

The substantial suicide risks among sexual minorities merits a comprehensive reaction. Policy makers should invest in research to understand and prevent suicide among sexual minorities. Clinicians should discuss sexual orientation with patients, and allocate appropriate mental health resources. Caretakers should watch for signs of suicide risk behaviors among

Table. Suicide Risk Behaviors Among Sexual Minority Adolescents in the United States, 2015[a]

	Unweighted No. of Participants[c]	Weighted Prevalence, % (95% CI)[d]	Adjusted Risk Ratio (95% CI)[e]
Seriously Considered Suicide[b]			
All			
Heterosexuals[f]	12770	14.8 (13.7-15.9)	1 [Reference]
Sexual minorities	1695	39.7 (36.4-42.9)	2.45 (2.12-2.81)
Homosexual	309	32.8 (22.4-43.1)	2.37 (1.54-3.34)
Bisexual	901	46.0 (41.5-50.4)	2.73 (2.32-3.18)
Questioning	485	31.9 (27.1-36.7)	1.97 (1.47-2.54)
Females			
Heterosexuals	6051	19.6 (17.7-21.6)	1 [Reference]
Sexual minorities	1180	43.2 (38.9-47.6)	2.07 (1.76-2.41)
Homosexual	163	40.2 (28.1-52.2)	2.16 (1.49-2.92)
Bisexual	726	47.9 (42.9-52.9)	2.27 (1.91-2.67)
Questioning	291	32.6 (24.6-40.7)	1.47 (0.96-2.08)
Males			
Heterosexuals	6719	10.6 (9.6-11.7)	1 [Reference]
Sexual minorities	515	32.0 (26.0-38.0)	3.40 (2.63-4.28)
Homosexual	146	25.5 (14.8-36.1)	2.60 (1.20-4.54)
Bisexual	175	38.5 (25.9-51.1)	4.44 (2.88-6.15)
Questioning	194	30.9 (23.5-38.3)	3.19 (2.18-4.36)
Planned Suicide[g]			
All			
Heterosexuals	12559	11.9 (10.7-13.0)	1 [Reference]
Sexual minorities	1666	34.9 (31.1-38.6)	2.59 (2.18-3.04)
Homosexual	303	29.0 (21.8-36.1)	2.43 (1.67-3.35)
Bisexual	891	40.8 (35.8-45.8)	2.85 (2.34-3.42)
Questioning	472	26.9 (22.3-31.5)	2.20 (1.73-2.74)
Females			
Heterosexuals	5960	15.7 (13.8-17.6)	1 [Reference]
Sexual minorities	1166	39.0 (34.2-43.9)	2.27 (1.87-2.72)
Homosexual	160	36.3 (23.9-48.8)	2.21 (1.40-3.15)
Bisexual	721	43.2 (37.7-48.7)	2.51 (2.02-3.05)
Questioning	285	29.3 (22.9-35.7)	1.67 (1.23-2.20)
Males			
Heterosexuals	6599	8.6 (7.4-9.8)	1 [Reference]
Sexual minorities	500	25.7 (20.5-30.9)	3.32 (2.38-4.46)
Homosexual	143	21.5 (12.2-30.8)	2.72 (1.50-4.35)
Bisexual	170	31.4 (19.5-43.2)	3.77 (2.06-5.95)
Questioning	187	23.6 (14.9-32.3)	3.49 (2.10-5.18)
Attempted Suicide[h]			
All			
Heterosexuals	10363	6.3 (5.5-7.2)	1 [Reference]
Sexual minorities	1373	24.9 (21.5-28.2)	3.37 (2.73-4.09)
Homosexual	236	20.4 (11.7-29.1)	2.94 (1.70-4.63)
Bisexual	762	31.9 (27.7-36.0)	4.28 (3.34-5.35)
Questioning	375	13.5 (9.3-17.7)	1.90 (1.22-2.85)

(continued)

Table. Suicide Risk Behaviors Among Sexual Minority Adolescents in the United States, 2015[a] (continued)

	Unweighted No. of Participants[c]	Weighted Prevalence, % (95% CI)[d]	Adjusted Risk Ratio (95% CI)[e]
Attempted Suicide (continued)[h]			
Females			
Heterosexuals	4973	8.4 (6.7-10.1)	1 [Reference]
Sexual minorities	981	27.8 (23.4-32.3)	3.01 (2.23-3.98)
Homosexual	128	25.8 (12.5-39.1)	2.64 (1.35-4.51)
Bisexual	618	34.1 (29.2-39.1)	3.76 (2.77-5.02)
Questioning	235	11.7 (6.7-16.7)	1.20 (0.63-2.04)
Males			
Heterosexuals	5390	4.5 (3.9-5.2)	1 [Reference]
Sexual minorities	392	18.2 (12.7-23.6)	4.34 (2.72-6.51)
Homosexual	108	14.7 (5.5-24.0)	3.56 (1.47-6.86)
Bisexual	144	22.8 (13.0-32.6)	5.71 (2.47-10.61)
Questioning	140	16.0 (8.9-23.1)	4.08 (2.06-7.12)

[a] Data were drawn from the 2015 National Youth Risk Behavior Survey. Nonresponse to the suicide consideration question was 1.0%; to the planning question 2.6%; and to the attempt question 19.7%. Missingness was not related to the relationship between sexual orientation and suicide risk behavior. The missing at random assumption held under various model testing.

[b] Seriously considered suicide was assessed by response to the question "During the past 12 months, did you ever seriously consider attempting suicide? (yes or no)."

[c] Relevant sample size after listwise deletion.

[d] Prevalence estimate for each outcome after weighting the data to be nationally representative of all adolescents.

[e] Risk ratio simulated from separate logistic regressions for each outcome with confounders for sex, age, race/ethnicity, English language proficiency, and grades. For the race/ethnicity categorical variable, the survey gave participants a list of prespecified races/ethnicities and participants selected categories that applied to them, including the option to select multiple categories. Race/ethnicity was used as a control because different races/ethnicities may have different suicide risks.

[f] Sexual orientation groups were assessed by response to the questions "What is your sex? (male or female)" and "Which of the following best describes you? (heterosexual [straight], gay or lesbian, bisexual, not sure)." Responses of "not sure" were defined as questioning.

[g] Planned suicide was assessed by response to the question "During the past 12 months, did you make a plan about how you would attempt suicide?"

[h] Attempted suicide was assessed by response to the question "During the past 12 months, how many times did you actually attempt suicide" (responses of ≥1 times were coded as a suicide attempt).

sexual minority adolescents, and seek supportive help when warranted.

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Accepted for Publication: October 11, 2017.

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Author Contributions: Mr Caputi had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.
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Obtained funding: Caputi, Smith.
Administrative, technical, or material support: All authors.
Supervision: All authors.

Conflict of Interest Disclosures: All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

Funding/Support: This work was supported by the Joseph Wharton Scholar program and the George J. Mitchell scholarship program from the US-Ireland Alliance (both Mr Caputi) and by grant P30 AI036214 from the University of California, San Diego, Center for AIDS Research, a National Institutes of Health–funded program (Dr Smith).

Role of the Funder/Sponsor: The funder did not influence the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; nor the decision to submit the manuscript for publication.

Additional Contributions: We thank Keith Schnakenberg, MA, PhD (Washington University in St Louis), for his uncompensated statistical review.

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