ARTICLE

Sexual Orientation and Risk of Suicide Attempts Among a Representative Sample of Youth

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Objective: To examine whether sexual orientation is an independent risk factor for reported suicide attempts.

Design: Data were from the Massachusetts 1995 Centers for Disease Control and Prevention Youth Risk Behavior Survey, which included a question on sexual orientation. Ten drug use, 5 sexual behavior, and 5 violence/victimization variables chosen a priori were assessed as possible mediating variables. Hierarchical logistic regression models determined independent predictors of suicide attempts.

Setting: Public high schools in Massachusetts.

Participants: Representative, population-based sample of high school students. Three thousand three hundred sixty-five (81%) of 4167 responded to both the suicide attempt and sexual orientation questions.

Main Outcome Measure: Self-reported suicide attempt in the past year.

Results: One hundred twenty-nine students (3.8%) self-identified as gay, lesbian, bisexual, or not sure of their sexual orientation (GLBN). Gender, age, race/ethnicity, sexual orientation, and all 20 health-risk behaviors were associated with suicide attempt ($P<.001$). Gay, lesbian, bisexual, or not sure youth were 3.41 times more likely to report a suicide attempt. Based on hierarchical logistic regression, female gender (odds ratio [OR], 4.43; 95% confidence interval [CI], 3.30-5.93), GLBN orientation (OR, 2.28; 95% CI, 1.39-3.37), Hispanic ethnicity (OR, 2.21; 95% CI, 1.44-3.99), higher levels of violence/victimization (OR, 2.06; 95% CI, 1.80-2.36), and more drug use (OR, 1.31; 95% CI, 1.22-1.41) were independent predictors of suicide attempt ($P<.001$). Gender-specific analyses for predicting suicide attempts revealed that among males the OR for GLBN orientation increased (OR, 3.74; 95% CI, 1.92-7.28), while among females GLBN orientation was not a significant predictor of suicide.

Conclusions: Gay, lesbian, bisexual, or not sure youth report a significantly increased frequency of suicide attempts. Sexual orientation has an independent association with suicide attempts for males, while for females the association of sexual orientation with suicidality may be mediated by drug use and violence/victimization behaviors.

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Editor's Note: Why is being G-BN more directly correlated with suicide attempts than L-BN?

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WITHIN THE past 50 years, suicide rates among adolescents in the United States have dramatically increased.[1] In the 15- to 24-year-old age group, the incidence of suicide has increased from 4.5 per 100 000 in 1950 to 13.2 per 100 000 in 1990. In 1996, suicide was the third-leading cause of death among youth ages 15 to 19 years, representing approximately 5000 deaths per year.[2] Data from the 1996 national Centers for Disease Control and Prevention (CDC) Youth Risk Behavior Survey (YRBS) indicate that approximately 9% of youths reported a suicide attempt within the past 12 months.[3] History of an attempted suicide is the most powerful predictor of an eventual suicide.[4-7]

Many studies have been conducted to determine risk factors for suicide among adolescents. Population-based research has identified recognized risks for suicide attempts, including gender, race/ethnicity, history of depression, hopelessness, alcohol and other drug use, sexual activity, and violence/victimization.[8-12] Factors that may exacerbate these risks include underlying psychological stresses, such as marginalization, isolation, and rejection.[13-15]

MATERIALS AND METHODS

SURVEY DESIGN

The CDC designed the YRBS to measure the prevalence of behaviors associated with leading causes of morbidity and mortality among youth attending high school. The YRBS is administered at a state level: a core group of questions are provided by the CDC, but state authorities can add questions to address topics of local or regional interest. In 1995, Massachusetts added a question assessing sexual orientation. This was the first time a sexual orientation question had been added to the standardized YRBS instrument. Data for this study were obtained from the 1995 Massachusetts YRBS, which was administered between February and May in representative public high schools across the state. Fifty-nine (94%) of 63 selected schools chose to participate. Within each school, approximately 80 students were randomly selected from 3 to 5 classrooms of 9th to 12th graders, providing a total sample of 4167 students.

The YRBS is a self-administered questionnaire consisting of 91 multiple-choice questions. The questionnaire was available in English, Spanish, and Portuguese. All participants were assured that the survey was anonymous and voluntary. Schools had the option of obtaining parental consent for participation; fewer than 10 students were denied parental permission. Of the selected students who were in school on the days the questionnaire was administered, fewer than 15 chose not to complete the survey. The 3365 students (81%) who responded to both the suicide and sexual orientation questions of the YRBS were chosen as the study population. Ten percent (n = 428) did not respond to the suicide question and 11% did not respond to the sexual orientation question, but these 2 groups had only a small overlap (n = 78 [1.9%]). Those who did not answer the sexual orientation question were more likely to also not answer the suicide attempt question than those who did answer the sexual orientation question (17.3% vs 9.4%; $P<.001$). There were no significant differences in age or gender among those included vs excluded from this study; however, students who self-identified as white (84.6%) were more likely to have answered the suicide and sexual orientation questions than those who self-identified as black (68.3%), Hispanic (62.1%), or "other" race (75%) ($P<.001$) and, hence, were more likely to have been included in the study.

VARIABLES

In addition to the suicide and sexual orientation variables, survey items assessing 20 health risks were identified a priori as possible mediating variables. A description of all variables follows.

Suicide Attempt

To evaluate suicidal behavior, subjects were asked how many times they had attempted suicide in the past 12 months. This variable was dichotomized into no suicide attempts in the past 12 months vs 1 or more suicide attempts in the past 12 months due to the small number of youths who reported multiple attempts. Of note, 34.5% of the 864 youths who had considered suicide actually attempted suicide, compared with 1.2% of those who did not report considering suicide ($P<.001$). Because suicidal ideation was relatively common in this population and suicide attempts is a more powerful predictor of future attempts and completions, the dependent variable was restricted to reported suicide attempt(s).[4-7]

Sexual Orientation

Sexual orientation was determined by the question, "Which of the following best describes you?" Responses were heterosexual (straight), gay/lesbian, bisexual, not sure, or none of the above. Students who self-identified as gay/lesbian, bisexual, or not sure were selected as the GLBN study population. Not sure respondents were included in the GLBN study group since it was felt that internal psychological conflict associated with questioning one's sexual identity may contribute to predisposing one to attempt suicide. In this sense, students questioning their sexual orientation would be more similar to gay, lesbian, and bisexual adolescents, who also experience significant sexual identity conflict, than to their heterosexual peers.[24,25] Respondents who answered "none of the above" were excluded from the analysis.

Violence

Five violence-related behaviors were measured. An example is, "During the past 12 months, how many times were you in a physical fight?" This variable was measured on an ordinal 8-point scale ranging from "0" to "12 or more times." Additional violence/victimization variables included failure to attend school because the

Homosexuality has also been suggested as a risk factor for youth suicide.[16-19] Gay, lesbian, bisexual, and not sure (GLBN) youth frequently encounter many of the environmental stresses thought to exacerbate suicidality[16-22]; however, studies of suicidality among gay youth have been difficult, because of the social stigma associated with both topics. With one exception, studies examining the relationship of suicide with sexual orientation have been limited to small samples that may not be representative of nonheterosexual youth as a group. Recently, an important population-based study by Remafedi et al[22] showed sexual orientation to be a significant risk factor for suicide attempts among youth; however, this 1987 data set lacked the ability to examine the association between sexual orientation and suicide risk within the context of other possible confounding and mediating variables, such as substance use, sexual activity, and violence/victimization.

Although population-based studies have found an association between sexual orientation, suicide risk, and other health-risk behaviors, the complexity of these relationships has not been well described.[22,23] Using a conceptual model, our study examined whether sexual orientation was an independent predictor of suicide attempts in a population-based sample of adolescents (**Figure**). We hypothesized that sexual orientation would be asso-

student "felt unsafe," "carried a weapon," was "injured or threatened with a weapon," and had "ever had sexual contact against your will." These variables were measured on similar ordinal scales. Ordinal responses were recoded as dichotomous variables (having not engaged in the behavior vs having engaged in the behavior 1 or more times).

Drug Use

Ten substance use variables were examined. Subjects were asked questions regarding their lifetime use of alcohol, marijuana, cocaine, crack, steroids, inhalants, injectables, and other illegal drugs, such as LSD, PCP, ecstasy, mushrooms, speed, ice, or heroin. A similar question focused on the recent use (past 30 days) of cigarettes and chewing tobacco or snuff. Responses were measured on ordinal scales. In terms of "hard" drug use—including cocaine, crack, steroids, inhalants, injectables, and other illegal drugs—responses were dichotomized into those who had ever used the drug vs those who had not, since any use of these substances was considered a high-risk behavior. The alcohol, snuff, cigarette, and marijuana variables were also dichotomized into low- and high-risk groups. Having had a drink on 10 or more days in your life, having used chewing tobacco or snuff on more than 2 of the past 30 days, having used marijuana more than twice in your life, and having used cigarettes on more than 9 of the past 30 days were classified as high-risk activities.

Sexual Behaviors

Five sexual risk behaviors were examined. Questions asked whether a respondent had ever been sexually active, and the number of partners with whom the respondent had had sexual intercourse. Subjects were asked whether alcohol or drugs were used at their last sexual encounter and whether they had ever been pregnant or gotten someone pregnant. Same-gender sexual experiences were also assessed by combining the student's gender with a variable that asked the gender of persons with whom the student had had sexual contact, with options of male(s), female(s), male(s) and female(s), and "I have not had sexual contact with anyone." Those respondents with same-gender experiences were compared with youths who did not report same-gender sexual experiences. This was a separate variable from self-identified sexual orientation.

RISK SCALES

Covariation or "clustering" among health-risk behaviors has been well described.[23,26] We theorized that no one specific behavior placed an individual at risk of attempted suicide but rather that higher levels of risk behavior would be predictive of suicide attempts. To assess the level of sexual, drug, and violence/victimization risk, the dichotomous variables assessing each of these areas that were statistically significant in the bivariate analyses were summed into sexual, drug, and violence/victimization indices. We had hypothesized that because of the clustering of health risk behaviors an individual voluntarily engages in, the drug and sexual behavior indices would have good internal consistency, whereas the violence/victimization index would not. In fact, the Cronbach α value for the drug index was 0.76; sexual risk index, 0.61; and violence/victimization index, 0.48, indicating that the violence/victimization index had poor internal consistency and therefore could not function as a scale. This supports the hypothesis that these involuntary behaviors would not covary in the same way as the voluntary drug use and sexual behaviors. The drug index had a possible range of 0 to 10, whereas the sexual and violence/victimization indices had a possible range of 0 to 5.

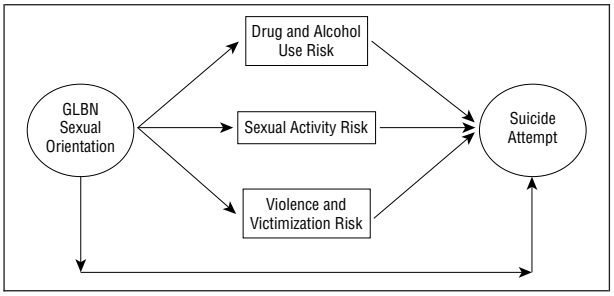
STATISTICAL ANALYSIS

All analyses were performed using weighted data. Weighting the data reduces the possible bias from nonresponders and reflects the likelihood of sampling each student. Weighting also adjusts for the intentional oversampling of Boston students that was done to coordinate the state YRBS with the city YRBS. Since the YRBS uses a random complex survey design and the statistical software used for this analysis (SPSS Inc, Chicago, Ill) assumes data collection with a simple random-sample design, hypotheses were tested at the $P = .001$. Thus, the likelihood of committing type I error was very small. Pearson χ^2 analysis examined the association between the 10 substance use, 5 sexual behavior, and 5 violence/victimization variables; sexual orientation; and self-reported suicide attempts. Nonparametric testing using the Mann-Whitney U test examined the relationship between the 3 risk indices and both sexual orientation and suicide attempts. Hierarchical logistic regression to determine independent predictors of suicide attempts was based on our conceptual model (Figure). Age, gender, and race/ethnicity were entered into the model simultaneously, followed by sexual orientation. Lastly, the 3 individual risk behavior scales were added to the model. Odd ratios (ORs) and 95% confidence intervals (CIs) are reported.

ciated with other known predictors of suicide attempts, including drug use, sexual risks, and violence/victimization, and would have an independent association with suicide attempts when controlling for these other known risk factors.

RESULTS

The 3365 (80.7%) of 4167 students responding to both the suicide and sexual orientation question composed the sample population; 49.6% were female and 78.6% were white. The mean age of the respondents was 16.1 years. A total of 9.9% of respondents reported 1 or more suicide attempts within the past 12 months. On the sexual orientation question, 17 self-identified as gay or lesbian (0.5%); 67 as bisexual (2.0%); and 44 as not sure (1.3%), giving a total of 129 students (3.8%) who self-identified as having GLBN orientation. Among nonheterosexuals only 1.7% of females self-identified as gay, lesbian, or bisexual, compared with 3.8% of males ($P<.002$). Gay, lesbian, bisexual, or not sure youths were more likely to report same-gender experiences (30.9%) than heterosexual youth (0.9%, $P<.001$); however, only 55% of those with same-gender experiences self-identified as GLBN. Among the overall population, the frequencies for the 10 drug use, 5 violence-related, and 5 sexual risk behaviors are



Conceptual model. GBLN indicates gay, lesbian, bisexual, or not sure.

presented in **Table 1**. The mean ± SD drug-risk index score was 2.2 ± 1.9, with a range of 0 to 10. Twenty-two percent had a score of 0; 22%, 1; 16%, 2; 18%, 3; 10%, 4; and 12%, 5 or more. The mean ± SD sexual risk score was 0.75 ± 1.00, with range of 0 to 5. Fifty-six percent scored a 0 on the sexual risk index; 22%, 1; 14%, 2; 7%, 3; and 1%, 4 or more. The mean ± SD violence/victimization score was 0.79 ± 0.97, with a range of 0 to 5. Fifty percent had no violence/victimization risks; 29%, 1 risk; 15%, 2 risks; 4%, 3 risks; and 2%, 4 or more risks.

Results of the χ^2 analyses revealed that gender, age, race/ethnicity, sexual orientation, and all 20 health risk behaviors were significantly associated with a self-reported suicide attempt within the past 12 months ($P<.001$) (**Table 2**). Those who classified themselves as GLBN were 3.4 times more likely to report a suicide attempt in the past year. Gay, lesbian, bisexual, or not sure male students were 6.50 times more likely to report a suicide attempt than heterosexual male students ($P<.001$). Gay, lesbian, bisexual, or not sure female students were 2.02 times more likely to report a suicide attempt than their heterosexual female peers ($P<.001$). Youths who were not sure of their sexual orientation were 2.49 times more likely to report a suicide attempt than their heterosexual peers (22.7% vs 9.1%, $P<.006$) and gay, lesbian, or bisexual youths were 3.88 times more likely to report a suicide attempt than heterosexual youths (35.3% vs 9.1%, $P<.001$). Students who reported using cocaine in their lives or having sexual contact against their will were 4 times more likely to have reported an attempted suicide within the past year that those without the risk factor. Those using alcohol or drugs before their last sexual intercourse or who reported having missed school because of fear about their safety were more than 3 times as likely to have attempted suicide. All 3 risk indices were significantly associated with sexual orientation and a reported suicide attempt in the past year. Those scoring higher on any of the 3 indices were more likely to report GLBN sexual orientation and to report a suicide attempt ($P<.001$).

When analyzed with hierarchical logistic regression (**Table 3**) among the overall sample population, gender, GLBN orientation, Hispanic ethnicity, higher rates of violence/victimization, and more drug use remained in the model as independent predictors of suicide attempts among youth ($P<.001$). After controlling for other factors, age and the sexual activity index were not statistically significant predictors within our model. Gay, lesbian, bisexual, or not sure youth were 2.28 times as likely as their peers to report a suicide attempt within the past 12 months (95% CI, 1.39-3.37). Among males, the OR associated with GLBN orientation increased to 3.74 (95% CI, 1.92-7.28), whereas among females, GLBN orientation did not remain statistically significant within the regression model. In addition, Hispanic ethnicity seemed to be a significant predictor of suicide for females but not males.

Table 1. Demographics of Study Sample (N = 3365)

	%
Characteristics	
Age, y*	
≤16	60.3
>16	39.6
Female	49.6
Race/ethnicity	
White, non-Hispanic	78.6
Black, non-Hispanic	5.4
Hispanic or Latino	6.3
Other	9.3
GLBN† sexual orientation	3.8
Suicide attempt	9.9
Behavioral Risks	
Drug use behaviors	
Cocaine	7.2
Crack cocaine	4.0
Steroids	3.9
Inhalants	19.7
Illegal drugs	17.5
Injectable drugs	2.4
Marijuana	41.4
Cigarettes	70.4
Alcohol	51.0
Smokeless tobacco	4.7
Violence-related behaviors	
Missed school because felt "unsafe"	4.8
Threatened with a weapon	19.6
Sexual contact against will	8.7
Injured in a fight	7.2
Engaged in a fight	38.2
Sexual behaviors	
Sexual intercourse	43.4
Been pregnant or gotten someone pregnant	3.7
Same-gender sexual experience	1.8
≥4 Sexual partners	13.5
Alcohol/drug use with sex	12.6

**SD, 16.1 years.*
†GLBN indicates gay, lesbian, bisexual, or not sure.

COMMENT

The dramatic increase in the death rate from suicide among youth makes the identification of significant risk factors a matter of public health importance. Improving the understanding of suicide risk assists in the identification of vulnerable youth as well as in the development of effective adolescent suicide prevention programs. Numerous factors have been identified as mediating the risk for suicide among youth; however, despite clinical suspicion and relative consistency among previous studies, controversy continues to exist as to whether sexual orientation is a significant risk factor for

Table 2. Bivariate Associations Between Predicted Risk Factors and Suicide Attempts in the Past 12 Months*

Risk Factors	Attempted Suicide, %		Contingency Coefficient
	Risk Factor(s)	No Risk Factors	
Female	13.4	6.4	0.12
GLBN† sexual orientation	31.0	9.1	0.14
Cocaine use	30.3	7.8	0.20
Crack cocaine use	46.3	8.1	0.25
Steroid use	45.8	8.4	0.24
Inhalant use	21.9	6.8	0.20
Illegal drug use	20.6	7.4	0.17
Marijuana use	14.1	6.2	0.13
Injection drug use	46.9	8.8	0.20
Cigarette use	12.1	3.6	0.12
Alcohol use	12.8	5.8	0.12
Smokeless tobacco use	19.6	9.2	0.07
Missed school because of fear	33.7	8.7	0.18
Threatened with a weapon	18.6	7.6	0.15
Sexual contact against will	30.0	7.5	0.22
Injured in a fight	33.3	7.9	0.22
Engaged in a fight	16.0	5.7	0.17
Sexual intercourse ever	13.6	6.1	0.13
Been pregnant or gotten someone pregnant	30.6	9.1	0.13
Same-gender sexual experience	30.6	9.2	0.10
≥4 Sexual partners	18.7	7.9	0.13
Alcohol/drug use with sex	16.0	5.7	0.17

*P<.001.
†GLBN indicates gay, lesbian, bisexual, or not sure.

Table 3. Logistic Regression Predicting a Reported Suicide Attempt in the Past 12 Months

	Odds Ratio (95% Confidence Interval)
Total Sample (N = 3267)	
Age (years)	0.89 (0.78-0.99)
Female	4.43 (3.30-5.93)
Race/ethnicity	
Black, non-Hispanic	0.49 (0.23-1.01)
Hispanic or Latino	2.21 (1.44-3.99)
Other	1.29 (0.85-1.96)
GLBN* sexual orientation	2.28 (1.39-3.37)
Drug use scale	1.31 (1.22-1.41)
Sexual behavior scale	0.98 (0.85-1.12)
Violence/victimization scale	2.06 (1.80-2.36)
Girls Only (n = 1646)	
Age (years)	0.87 (0.75-0.99)
Race/ethnicity	
Black, non-Hispanic	0.41 (0.16-1.10)
Hispanic or Latino	2.66 (0.56-4.54)
Other	1.20 (0.71-2.00)
GLBN sexual orientation	1.42 (0.65-3.09)
Drug use scale	1.28 (1.16-1.41)
Sexual behavior scale	1.02 (0.86-1.21)
Violence/victimization scale	2.35 (1.97-2.80)
Boys Only (n = 1632)	
Age (years)	0.90 (0.75-1.00)
Race/ethnicity	
Black, non-Hispanic	0.68 (0.22-2.08)
Hispanic or Latino	1.66 (0.77-3.58)
Other	1.37 (0.65-2.89)
GLBN sexual orientation	3.74 (1.92-7.28)
Drug use scale	1.36 (1.23-1.51)
Sexual behavior scale	0.92 (0.74-1.15)
Violence/victimization scale	1.64 (1.32-2.05)

*GLBN indicates gay, lesbian, bisexual, or not sure.

youth suicide, in part due to a lack of carefully designed, population-based studies examining the issue.[27-30]

When Massachusetts modified its version of the 1995 YRBS by including a question addressing sexual orientation, it provided an opportunity to explore issues of suicide risk among a representative, population-based sample of self-identified GLBN youth. It also created an opportunity to examine suicide risk among youth within the context of other possible confounding and mediating variables, such as age, gender, race/ethnicity, and risk behaviors. In the present study we used this data set to test a conceptual model postulating that sexual orientation has both direct and indirect effects on the likelihood of attempting suicide. Our results support this empirical model. In the overall population, after adjusting for other confounding demographic variables and level of engagement in health risks associated with an increased likelihood of a suicide attempt, sexual orientation had the second highest odds ratio for predicting a suicide attempt. The findings also reveal that higher levels of engagement in risk behaviors, such as using substances, engaging in violent behaviors, or being victimized, seem to play a role in mediating the increased suicide risk reported by GLBN youth. These results are consistent with previous nonrepresentative and retrospective research that examined the risks of GLBN youth as well as a recent population-based study by Remafedi et al.[22]

The study by Remafedi et al[22] also showed that, in gender-specific analyses, sexual orientation was predictive among males but not females. Our study supports their findings. Gay, lesbian, bisexual, or not sure orientation was predictive of reported suicide attempts for males in both the bivariate and multivariate analyses. In contrast, among females, the increased suicide risk associated with GLBN orientation was evident only in the bivariate, not the multivariate, analyses. This may suggest that the increased suicide risk among GLBN females does not reflect an independent association with sexual orientation but rather reflects possible confounding and mediating factors, such as gender, race/ethnicity, and level of engagement in risk behaviors. Among gay and bisexual male adolescents, prior studies have correlated suicide rates with factors such as self-identification as homosexual at younger ages, female gender role, family dysfunction, interpersonal conflict regarding sexual orientation, and nondisclosure of sexual orientation to others.[16,17,19,21] Issues such as gender nonconformity and other factors directly related to self-identified homosexual or bisexual orientation, such as isolation, social rejection, or parental aspects of acceptance, may disproportionately affect GLBN adolescent males in comparison with females, thus contributing to the independent association found in our study.

In addition, age at self-identification may be another factor mitigating the gender differences in the effect of sexual orientation on suicide risk.[16] Gay, lesbian, bisexual, or not sure females typically self-identify as homosexual/bisexual at later ages than GLBN males.[25] The findings of this study are consistent with this hypothesis, as fewer females than males self-reported gay, lesbian, or bisexual orientation; however, among those students who self-identified as not sure of their orientation, a higher percentage were female (1.7% vs 0.9%). Perhaps a delayed "coming out" process among GLBN females decreases the stress associated with disclosure and serves a protective function against suicide associated with sexual orientation. Unfortunately, beyond individual behaviors, the YRBS instrument does not allow delineation of suicide risk in areas such as depression, social marginalization, or age at self-identification. The development of improved survey instruments that address these complex issues will be useful to begin to address these concerns.

The prevalence of self-reported gay, lesbian, or bisexual identity in surveys of teenagers is typically much lower than the commonly quoted prevalence of 5% to 10% in adults.[20,25] A period of confusion concerning sexual orientation often precedes self-identification as gay, lesbian, or bisexual and may preclude self-identification during adolescence.[25] Adolescents also have a more fluid sexual identity, so that same-sex experiences may not accurately reflect self-identified sexual orientation. Among the students who responded "not sure" in the current study, there is no way of determining which students were truly unsure of their sexual orientation vs which were confused about the question itself or possible responses. Prior studies concluded that suicide attempts in homosexual youth tended to occur in response to the emotional distress associated with an emerging homosexual identity or gender-atypical behavior.[16,31] Others reported that suicides occurred after conflict regarding sexual orientation, either distress over an undisclosed homosexual orientation or rejection following disclosure.[19,32,33] The bivariate analyses in this study suggest that questioning youth were more likely to attempt suicide than their heterosexual peers, but the risk was lower than for self-identified gay, lesbian, or bisexual youth.

Suicide and suicidal behavior fall along a continuum from suicidal ideation to a fatal, completed suicide. Although suicide completers are a primary clinical concern, the goal of prevention makes it important to examine nonlethal behaviors, such as suicide attempts.[4] While not all completers have a history of attempts, approximately one third of suicides and as many as 50% of female completers have made a previous attempt.[4] Because data on suicide are often derived from mortality statistics collected from death certificates, information regarding the sexual orientation of adolescent suicide victims is minimal. This population-based information on individuals who report an attempted suicide is relied on for the examination of psychosocial risk factors.

As a secondary data analysis, this study was limited by a lack of standardized measures of suicide attempts. In addition, the data collected were part of a cross-sectional survey, and therefore we can not draw conclusions about causality. Although these data may be generalizable to most adolescents who attend public high school, other high-risk youths, such as homeless or runaway youths, who do not regularly attend school may not be represented by our data. Further limitations include regional limitations, for which studies of national data may prove helpful in identifying differences. In addition, this analysis was based on self-reported behaviors, and it cannot be determined whether respondents may have overreported or underreported risk. The YRBS instrument was developed by the CDC, and the validity and reliability of adolescent self-reported behaviors have been discussed previously[34]; however, the validity and reliability of the sexual orientation question remain unclear in part due to social stigma and other pressures of the coming-out process. Embarrassment, regardless of orientation, fear of discovery, and anxieties about sexual questions in general may also affect an adolescent's ability to answer such a question. As such, our sample of 129 GLBN respondents most likely does not represent all gay, lesbian, and bisexual youths within the study population. Clearly, the use of prospective studies and the development of sensitive, specific, valid, and reliable questions regarding sexual identity and orientation are critical areas in need of further work.

CONCLUSIONS

In support of prior anecdotal and nonrepresentative data, this population-based study identifies GLBN sexual orientation as an important independent predictor of suicide attempts among adolescents. After adjusting for other potential confounding and mediating factors, in this population, our findings indicate that a nonheterosexual sexual orientation significantly increases the odds of a suicide attempt.

While most gay, lesbian, and bisexual youths cope with stresses and become healthy, productive adults, understanding the interrelationships among demographic variables, health risk behaviors, sexual orientation, and suicide risk may aid in the recognition of vulnerable youths and the identification of individuals at risk. Perhaps the challenge is to move beyond statistical estimates of risk to the exploration of more complex issues, such as resiliency or the effects of marginalization on adolescent development and well-being.

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