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

Robert Garofalo, MD; R. Cameron Wolf, MS; Lawrence S. Wissow, MD, MPH; Elizabeth R. Woods, MD, MPH; Elizabeth Goodman, MD

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.


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

Catherine D. DeAngelis, MD

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.\(^6,12\) Factors that may exacerbate these risks include underlying psychological stresses, such as marginalization, isolation, and rejection.\(^13,15\)
Homosexuality has also been suggested as a risk factor for youth suicide.\textsuperscript{16-19} Gay, lesbian, bisexual, and not sure (GLBN) youth frequently encounter many of the environmental stresses thought to exacerbate suicidality;\textsuperscript{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\textsuperscript{23} 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.\textsuperscript{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-
A total of 9.9% of respondents reported 1 or more suicide attempts when controlling for these other known risk factors. The mean age of the respondents was 16.1 years. The sample population; 49.6% were female and 78.6% were male. The suicide and sexual orientation question composed the known risk factors. With suicide attempts when controlling for these other known predictors of suicide attempts, drug use, sexual risks, 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’s 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.

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 associated 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.

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’s 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.
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 χ² 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 2.28 times as statistically significant predictors within our model. Gay, factors, age and the sexual activity index were not statistically significant predictors within the model. Gay, lesbian, bisexual, or not sure female students were 2.02 times more likely to report a suicide attempt than heterosexual male students (P < .001). Gay, lesbian, bisexual, or not sure female students were 6.50 times more likely to report a suicide attempt in the past year. Gay, lesbian, bisexual, or not sure male students were 3.8 times more likely to report a suicide attempt than heterosexual female students (P < .001). Those who classified themselves as GLBN were 3.74 (95% CI, 1.92-7.28), whereas among females, GLBN sexual 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.

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...
gender-specific analyses, sexual orientation was pre-
portant in mediating the increased suicide risk reported
that GLBN youth. These results are consistent with pre-
ents in risk behaviors, such as using substances, engag-
engages in violent behaviors, or being victimized, seem to play
ment in risk behaviors associated with an increased likeli-
principal findings. Gay, lesbian, bisexual, or not sure orien-
remained the risks of GLBN youth as well as a recent
a role in mediating the increased suicide risk reported
and recent 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 al22 also showed that, in
dictive 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 non-disclosure 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.

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

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Attempted Suicide, %</th>
<th>No Risk Factor(s)</th>
<th>Odds Ratio (95% Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>13.4</td>
<td>6.4</td>
<td>0.12</td>
</tr>
<tr>
<td>GLBN† sexual orientation</td>
<td>31.0</td>
<td>9.1</td>
<td>0.14</td>
</tr>
<tr>
<td>Cocaine use</td>
<td>30.3</td>
<td>7.8</td>
<td>0.20</td>
</tr>
<tr>
<td>Crack cocaine use</td>
<td>46.3</td>
<td>8.1</td>
<td>0.25</td>
</tr>
<tr>
<td>Steroid use</td>
<td>45.8</td>
<td>8.4</td>
<td>0.24</td>
</tr>
<tr>
<td>Inhalant use</td>
<td>21.9</td>
<td>6.8</td>
<td>0.20</td>
</tr>
<tr>
<td>Illegal drug use</td>
<td>20.6</td>
<td>7.4</td>
<td>0.17</td>
</tr>
<tr>
<td>Marijuana use</td>
<td>14.1</td>
<td>6.2</td>
<td>0.13</td>
</tr>
<tr>
<td>Injection drug use</td>
<td>46.9</td>
<td>8.8</td>
<td>0.20</td>
</tr>
<tr>
<td>Cigarette use</td>
<td>12.1</td>
<td>3.6</td>
<td>0.12</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>12.8</td>
<td>5.8</td>
<td>0.12</td>
</tr>
<tr>
<td>Smokeless tobacco use</td>
<td>19.6</td>
<td>9.2</td>
<td>0.07</td>
</tr>
<tr>
<td>Missed school because of fear</td>
<td>33.7</td>
<td>8.7</td>
<td>0.18</td>
</tr>
<tr>
<td>Threatened with a weapon</td>
<td>18.6</td>
<td>7.6</td>
<td>0.15</td>
</tr>
<tr>
<td>Sexual contact against will</td>
<td>30.0</td>
<td>7.5</td>
<td>0.22</td>
</tr>
<tr>
<td>Injured in a fight</td>
<td>33.3</td>
<td>7.9</td>
<td>0.22</td>
</tr>
<tr>
<td>Engaged in a fight</td>
<td>16.0</td>
<td>5.7</td>
<td>0.17</td>
</tr>
<tr>
<td>Sexual intercourse ever</td>
<td>13.6</td>
<td>6.1</td>
<td>0.13</td>
</tr>
<tr>
<td>Been pregnant or gotten someone pregnant &amp; Š Adolescent sexual experience</td>
<td>30.6</td>
<td>9.1</td>
<td>0.13</td>
</tr>
<tr>
<td>≥4 Sexual partners</td>
<td>18.7</td>
<td>7.9</td>
<td>0.13</td>
</tr>
<tr>
<td>Alcohol/drug use with sex</td>
<td>16.0</td>
<td>5.7</td>
<td>0.17</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Total Sample (N = 3267)</th>
<th>Girls Only (n = 1646)</th>
<th>Boys Only (n = 1632)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>0.89 (0.78-0.99)</td>
<td>0.90 (0.75-1.00)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>0.41 (0.16-1.10)</td>
<td>0.68 (0.22-2.08)</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>2.66 (0.56-4.54)</td>
<td>1.66 (0.77-3.58)</td>
</tr>
<tr>
<td>Other</td>
<td>1.20 (0.71-2.99)</td>
<td>1.37 (0.65-2.89)</td>
</tr>
<tr>
<td>GLBN* sexual orientation</td>
<td>2.28 (1.39-3.37)</td>
<td>3.74 (1.92-7.28)</td>
</tr>
<tr>
<td>Drug use scale</td>
<td>1.31 (1.22-1.41)</td>
<td>1.36 (1.23-1.51)</td>
</tr>
<tr>
<td>Sexual behavior scale</td>
<td>0.98 (0.85-1.12)</td>
<td>0.92 (0.74-1.15)</td>
</tr>
<tr>
<td>Violence/victimization scale</td>
<td>2.06 (1.80-2.36)</td>
<td>2.35 (1.97-2.80)</td>
</tr>
</tbody>
</table>

*GLBN indicates gay, lesbian, bisexual, or not sure.
In addition, age at self-identification may be another factor mitigating the gender differences in the effect of sexual orientation on suicide risk. Gay, lesbian, bisexual, or not sure females typically self-identify as homosexual/bisexual at later ages than GLBN males. 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. A period of confusion concerning sexual orientation often precedes self-identification as gay, lesbian, or bisexual and may preclude self-identification during adolescence. 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. Others reported that suicides occurred after conflict regarding sexual orientation, either distress over an undisclosed homosexual orientation or rejection following disclosure. 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. 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. 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 cannot 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; 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.

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.

Accepted for publication September 9, 1998.

This work was funded in part by grant BRH 970155 for Special Projects of National Significance and project grant MCJ-MA 259195 from the Maternal and Child Health Bureau (Title V, Social Security Act), Health Resources and Services Administration, Department of Health and Human Services, Washington, DC (Dr Goodman), and by the Dyson Foundation of New York Inc, New York.

We thank the staff of the Sidney Borum Community Health Center, Boston, Mass, and Steven Tierney, EdD, for their comments and support.


Corresponding author: Robert Garofalo, MD, Sidney Bowman Community Health Center, 130 Boylston St, Boston, MA 02116 (e-mail: rgarofalo@jrihealth.org).
REFERENCES