

C013440 ABSTRACT: This study is one of the first to examine the association between sexual orientation and health risk behaviors among a representative, school-based sample of adolescents. It was conducted on an anonymous, representative sample of students in public high schools from Massachusetts' expanded Centers for Disease Control and Prevention 1995 Youth Risk Behavior Survey. Health risk and problem behaviors were analyzed comparing GLB (gay, lesbian, bisexual) youth and their peers. Those variables found to be significantly associated with GLB youth were then analyzed by multiple logistic regression models. GLB youth who self-identify during high school report disproportionate risk for a variety of health risk and problem behaviors, including suicide, victimization, sexual risk behaviors, and multiple substance use. In addition, these youth are more likely to report engaging in multiple risk behaviors and initiating risk behaviors at an earlier age than are their peers. These findings suggest that educational efforts, prevention programs, and health services must be designed to address the unique needs of GLB youth (authors).

Title The Association Between Health Risk Behaviors and Sexual Orientation Among a School-Based Sample of Adolescents.

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[Headnote]

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[Headnote]

ABSTRACT. Objective. This study is one of the first to examine the association between sexual orientation and health risk behaviors among a representative, school-based sample of adolescents. Design. This study was conducted on an anonymous, representative sample of 4159 9th- to 12th-grade students in public high schools from Massachusetts' expanded Centers for Disease Control and Prevention 1995 Youth Risk Behavior Survey. Sexual orientation was determined by the following question: "Which of the following best describes you?" A total of 104 students selfidentified as gay, lesbian, or bisexual (GLB), representing 2.5% of the overall population. Of GLB youth, 66.7% were male and 70% were white (not Hispanic). Health risk and problem behaviors were analyzed comparing GLB youth and their peers. Those variables found to be significantly associated with GLB youth were then analyzed by multiple logistic regression models.

[Headnote]

Results. GLB youth were more likely than their peers to have been victimized and threatened and to have been engaged in a variety of risk behaviors including suicidal ideation and attempts, multiple substance use, and sexual risk behaviors. Four separate logistic regression models were constructed. Model I, Onset of Behaviors Before Age 13, showed use of cocaine before age 13 years as strongly associated with GLB orientation (odds ratio [OR]: 6.10; 95% confidence interval [CI] = 2.45-15.20). Early initiation of sexual intercourse (2.15; 1.06-4.38), marijuana use (1.98; 1.04-4.09), and alcohol use (1.82; 1.03-3.23) also was associated with GLB orientation. Model II, Lifetime Frequencies of Behaviors, showed that frequency of crack cocaine use (1.38; 1.06-1.79), inhalant use (1.30; 1.05-1.61), and number of sexual partners (1.27; 1.06-1.43) was associated with GLB orientation. Model III, Frequency of Recent Behaviors, showed smokeless tobacco use in the past 30 days (1.38; 1.20-1.59) and number of sexual partners in the previous 3 months (1.47; 1.31-1.65) were associated with GLB orientation. Model IV, Frequency of Behaviors at School, showed having one's property stolen or deliberately damaged (1.23; 1.05-1.40) and using marijuana (1.29; 1.05-1.59) and smokeless tobacco (1.53; 1.30-1.81) were associated with GLB orientation. Overall, GLB respondents engaged dis

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proportionately in multiple risk behaviors, reporting an increased mean number of risk behaviors (mean = 6.81 + 4.49) compared with the overall student population (mean = 3.45 3.15). Conclusion. GLB youth who self-identify during high school report disproportionate risk for a variety of health risk and problem behaviors, including suicide, victimization, sexual risk behaviors, and multiple substance use. In addition, these youth are more likely to report engaging in multiple risk behaviors and initiating risk behaviors at an earlier age than are their peers. These findings suggest that educational efforts, prevention programs, and health services must be designed to address the unique needs of GLB youth. *Pediatrics* 1998; 101:895-902; sexual orientation, suicide, victimization, risk behaviors.

[Headnote]

ABBREVIATIONS. GLB, gay, lesbian, and bisexual; HIV, human immunodeficiency virus; AIDS, acquired immunodeficiency syndrome; CDC, Centers of Disease Control and Prevention; YRBS, Youth Risk Behavior Survey; OR, odds ratio; CI, confidence interval.

Gay, lesbian, and bisexual (GLB) adolescents face tremendous challenges growing up physically and mentally healthy in a culture that is often unaccepting. 1-14 Medical, sociological, and psychological research indicates that these youth face rejection, isolation, verbal harassment, and physical violence both at school and at home. 4 According to Jessor's Problem Behavior Theory, these stresses place GLB adolescents at risk of engaging in individual risk behaviors, clusters of risk behaviors, and initiating behaviors at an earlier age than their peers. 16 Previous studies support the notion that many GLB youth engage in an array of individual behaviors that increase their risk for a number of negative health outcomes including suicide, depression, physical and verbal victimization, substance use, and HIV. 13-5, 12-4 For example, suicide is a leading cause of death among GLB and transgendered youth. 13 In a study of 137 gay and bisexual males 14 to 21 years of age, Remafedi et al showed that 29% reported a suicide attempt, with half of these reporting multiple attempts. 1 It has been estimated that gay and lesbian youth are two to three times more likely to attempt suicide than their heterosexual peers and may account for 30% of suicides among youth annually. 13

In terms of school-related behaviors and victimization, a study conducted by the National Gay and Lesbian Task Force found that 45% of the gay men and 20% of the lesbians surveyed were victims of verbal and physical assaults in secondary schools. 12 In a survey of school counselors, 54% agreed that students often degrade fellow students whom they discover are homosexual, and 67% strongly agreed that homosexual students are more likely than others to feel isolated and rejected. 11 Another study reported that 28% of homosexual youth were dropping out of secondary school because of discomfort and fear. 9

Regarding sexual risk behaviors, all adolescents are at potential risk for HIV infection. Yet not all are faced with equal levels of risk. High-risk sexual activity between men accounts for the largest proportion of AIDS cases among adolescents and has been implicated in 70% of adolescent AIDS cases unrelated to infected blood products. 17 In 1995 AIDS became the leading cause of death in the United States for males 25 to 44 years of age. 18 Given the inherent latency for HIV, many of these deaths are attributable to infection occurring during adolescence. Among a subset of young homosexual and bisexual males in the San Francisco area (17 to 22 years), Lemp and colleagues reported in the Young Men's Survey an overall HIV seroprevalence rate of 9.3% and a seroprevalence rate of 21.2% among African American men. 14

Unfortunately, previous research designed to examine the risks and needs of GLB youth is often hampered by societal stigmas about homosexuality and difficulties identifying a representative sample population. Much of what is known concerning the association between gay youth and health risk behaviors is derived from studies using self-select populations such as homeless/runaway youth, youth presenting to sexually transmitted disease clinics, or youth responding to advertisements in gay newspapers or dance clubs. Cransten and Faulkner used data from a representative survey of high school students to report an increased risk for a variety of behaviors including suicide, substance use, and violence among adolescents with same-gender sexual contacts. 20 Representative, population-based data examining the association between sexual orientation and adolescent risk behaviors have been limited. Using Jessor's Problem Behavior Theory as a model, this study will use an anonymous, representative, school-based sample to examine the association between self-reported GLB sexual orientation and multiple health risk behaviors among adolescents. Variables examined include suicidal ideation and attempts, violence-related behaviors, school-based victimization, drug use, sexual risk behaviors, and the early initiation of risk behaviors.

METHODS**Survey Design**

The Centers of Disease Control and Prevention (CDC) designed the Youth Risk Behavior Survey (YRBS) to measure the prevalence of behaviors associated with leading causes of morbidity and mortality among youth. Data for this study were obtained from the 1995 Massachusetts YRBS. The YRBS was conducted between February and May 1995 in representative public high schools chosen across Massachusetts. Fifty-nine of 63 (94%) schools initially selected chose to participate. Within each school, ~80 students from three to five classrooms of 9th to 12th graders were randomly selected, providing a total sample of 4159 students. The demographic characteristics of the students are presented in Table 1.

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 both anonymous and voluntary. Schools had the option of obtaining parental consent for participation; fewer than 10 students were denied parental permission. Of the students selected who were in school on the days the questionnaire was administered, fewer than 15 chose not to complete the survey.

Variables

Sexual orientation was determined by the question: "Which of the following best describes you?" Responses were heterosexual (straight), gay/lesbian, bisexual, not sure, and none of the above. This marked the first time a question regarding sexual orientation had been added to the standardized YRBS instrument produced by the CDC. Students who self-identified as gay/lesbian ($n = 23$) or bisexual ($n = 81$) were selected as the GLB study population. Subjects who answered "not sure" ($n = 57$) were not included in the GLB group because we were interested in the behaviors of students who had already identified as GLB in orientation. In addition, in terms of same-gender sexual contact as well as other sexual and health risk behaviors, the "not sure" respondents appeared quite different from the GLB respondents. "None of the above" respondents were included in the non-GLB group. GLB respondents were compared with their peers on a number of health risk and problem behaviors contained in the YRBS, including violence/victim-related behaviors, suicidal ideation and attempts, substance use, and sexual risk behaviors. Analyses were conducted with the "not sure" group as part of the non-GLB group. Each analysis was then repeated with the "not sure" group excluded from the non-GLB group.

To evaluate violent behaviors, subjects were asked, "During the past 12 months, how many times were you in a physical fight?" The variable was measured on an eight-point scale ranging from 0 to 12 or more times. Subjects also were asked how frequently injuries from a fight required medical attention and how frequently fights occurred on school property. Other violence-related threats on school property included failure to attend school in the past 30 days attributable to "felt unsafe," "carried a weapon," "property stolen or deliberately damaged", and "injured or threatened with a weapon." Questions of weapon-carrying included, "During the past 30 days, on how many days did you carry a weapon such as gun, knife, or club?"

To evaluate suicidal behaviors, subjects were asked whether they had "attempted" suicide in the past 12 months. Respondents were asked whether attempts had resulted in injury requiring medical attention.

To evaluate substance use, subjects were asked questions about tobacco, alcohol, and illegal drug use. Questions evaluating tobacco use asked if cigarettes had ever been tried, the age first tried, and daily use ("that is, at least one cigarette every day for 30 days"). Another question focused on the recent use of chewing tobacco and snuff. Regarding alcohol use, respondents were asked, "How old were you when you had your first drink of alcohol other than a few sips?" Recent alcohol use (in past 30 days), frequency of binge drinking ("five or more drinks" consumed at one time), and lifetime frequency of alcohol use also were assessed.

To evaluate illegal drug use, subjects were asked questions regarding the use of marijuana, cocaine, and other drugs such as injectables and inhalants. Subjects were asked the age at which marijuana was first tried, the age at which any form of cocaine was first tried, and the frequency of use for each substance in the past 30 days. Concerning lifetime use, subjects were asked, "During your life, how many times have you tried marijuana. . . how many times have you used any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, heroin." Additional questions asked whether subjects had "ever injected (shot up) any illegal drug" or engaged in needle-sharing practices.

TABLE 1.

Sexual risk behaviors were measured with questions asking the number of people with whom the respondent had sexual intercourse in both the past 3 months and in his or her lifetime, and the age at first intercourse. Subjects were asked whether alcohol or drugs were used at their last sexual encounter and whether they had "ever had sexual contact against your will."

Finally, a Risk Behavior Scale was constructed using 20 health risk and problem behaviors statistically significant at the bivariate level ($P < .001$) including weapon carrying, fighting, tobacco, alcohol and other drug use, and sexual risk behaviors. This scale was used to assess the sum total number of behaviors in which each student had engaged. The scale ranged from 0 to 18, with a mean of 3.45 ± 3.18 among the total study population and a skewness of 1.06 ± 0.04 . The internal consistency of the 20 behaviors using the ordinal scale responses was 0.83.

The Cronbach's α for the scale in its present format was 0.82.

Statistical Analysis

Data cleaning and preliminary analysis were performed by Westat, Inc (Rockville, MD) under contract by the CDC. Weighting the data reduces possible bias from nonresponders and reflects the likelihood of sampling each student. Weighting also adjusts for the intentional oversampling of Boston students, which was done to coordinate the state YRBS with the city YRBS. The weight use for estimation is given by:

All analyses were performed on weighted data. χ^2 Analysis was used to compare health risk behaviors among students with reported GLB orientation and their peers. Because the YRBS uses a complex survey design and not a simple random sample design, a P level of .001 was used to test our hypotheses as well as to determine which variables from the bivariate analyses would be considered for the multivariate analyses. From each area of risk behavior, representative variables associated significantly with GLB orientation were analyzed using four stepwise multiple logistic regression models: onset of behaviors before age 13 years, lifetime frequencies of behaviors, frequency of recent behaviors, and frequency of behaviors at school. Each regression model included gender and minority racial group versus white nonHispanic. Because of the small sample size of GLB respondents, race and gender interactions with other risk behaviors were not included in the χ^2 analyses. The logistic regressions models were computed using a forward stepwise procedure in which the removal testing is based on the probability of a likelihood ratio statistic based on the maximum partial likelihood estimates. For interval and ordinal variables, the adjusted odds ratios (ORs) that are reported reflect the odds associated with each increasing unit of ordinal variable and therefore are smaller than those for the dichotomous independent variables. In other words, as the frequency of engaging in a risk behavior increases, the ORs or magnitude of the association reported for each regression model increases in proportion to the score on our ordinal scale. In addition, the Risk Behavior Scale used statistically significant ($P < .001$) variables at the bivariate level and was analyzed with a Kruskal-Wallis analysis of variance test.

RESULTS

The demographic distribution of the 1995 Massachusetts YRBS is described in Table 1. On the sexual orientation question, 104 students self-identified as having GLB orientation, representing 2.5% of the overall study population (0.6% gay/lesbian and 1.9% bisexual). An additional 1.5% of the study population responded "not sure," and 3.7% responded "none of the above." A total of 9.3% did not answer the question altogether. Of GLB youth, 66.7% were male and 70% were white (not Hispanic). There were no statistically significant age differences between GLB youth and the overall population. In contrast, there were a higher percentage of male respondents among the GLB population than in the overall student population (66.7% vs 50.3%). There were no statistically significant differences between GLB youth and the overall population in terms of white (not Hispanic), black, and Hispanic students. Of note, 8 of 36 (22%) Native Americans surveyed self-identified as GLB.

Results of the χ^2 analysis revealed greater than 30 health risk behaviors positively associated with self-reported GLB orientation ($P < .0001$), including violence-related behaviors, suicidal ideation and attempts, multiple substance use, and sexual risk behaviors (Table 2). GLB youth were more likely to carry a weapon in the past 30 days, engage in a physical fight in the past 12 months, and attempt suicide in the past 12 months. Regarding substance use, GLB orientation was associated with an increased lifetime frequency of use of cocaine, crack, anabolic steroids, inhalants, "illegal," and injectable drugs. GLB youth were more likely to report using tobacco, marijuana, and cocaine before 13 years of age. Among sexual risk behaviors, sexual intercourse before 13 years of age, sexual intercourse with four or more partners both in lifetime and in the past 3 months, and sexual contact against one's will all were associated with GLB orientation. Within school environments, GLB youth were more likely to report being threatened/injured with a weapon, failing to attend school because of fear, having property stolen or deliberately damaged, using tobacco, carrying a weapon, and engaging in a physical fight.

When analyzed with multiple logistic regression, model I showed that use of cocaine before age 13 years was strongly associated with self-reported GLB orientation (Table 3). Early initiation (<13 years of age) of alcohol use, marijuana use, and engaging in sexual intercourse also were significantly associated with GLB versus non-GLB orientation. Gender and race were not significant predictors of GLB orientation in the model. When the analyses were repeated with the "not sure" respondents excluded from the non-GLB group, cocaine use (OR = 7.52), marijuana use (OR = 2.51), and alcohol use (OR = 1.87) continued to be associated with GLB orientation. However, minority race/ethnic group also was associated with GLB orientation (OR = 1.28).

In model II, lifetime frequency of engaging in health risk behaviors was examined. Three variables were associated with self-reported GLB orientation, including frequency of crack cocaine or freebase use, number of sexual partners, and use of inhalants (Table 3). Neither gender nor minority race/ethnic group remained in the model as significant correlates of GLB orientation. As the frequency of engaging in each behavior increased, the ORs or magnitude of the association between that behavior and sexual orientation increased in proportion to the score on our ordinal scale. For example, although students who used crack or freebase one or two times were 1.38 times as likely to be GLB, students who reported using crack or freebase 20 to 39 times (scored 4 on our ordinal scale) were 5.52 times more likely to be GLB than someone who had not used crack or freebase. Also, students with six or more sexual partners in their life (scored 6 on our scale) were 7.62 times more likely to be classified as GLB than were students who had never had sexual intercourse. When the "not sure" students were excluded from the analyses, lifetime cocaine use (OR = 1.38) and number of sexual partners (OR = 1.28) remained in the model, but inhalant use dropped out of the model. However, frequency of suicide attempts (OR = 1.38; $P = .042$) entered into the model.

In model III, frequency of recent behaviors, smokeless tobacco use in the previous 30 days and number of sexual partners in the previous 3 months were significantly associated with GLB versus non-GLB association (Table 3). Gender and minority race/ethnicity were not significantly associated with GLB orientation. GLB students were 8.28 times more likely to report being daily users of smokeless tobacco. Similarly, students who reported six or more sexual partners in the previous 3 months were 10.29 times more likely to also report being GLB. When analyzed without the "not sure" group of students, smokeless tobacco use (OR = 1.40; $P = .0001$) and number of sexual partners (OR = 1.44; $P = .0001$) remained in the model. In addition, race/ethnicity (OR = 1.29; $P = .039$) was associated with reported GLB orientation.

In model IV, frequency of behaviors at school, the frequency during the previous 12 months that students reported having property such as a car, clothing, or books stolen or deliberately damaged was associated with being GLB (Table 3). The frequency of marijuana and smokeless tobacco use on school property in the previous 30 days also was associated with reporting to be GLB. When the "not sure" students were excluded from the analysis, GLB orientation was associated with the frequency of being threatened with a weapon on school property (OR = 1.22; $P = .024$), frequency of property victimization at school (OR = 1.19; $P = .032$), and smokeless tobacco use at school (OR = 1.56; $P = .0001$). On the Risk Behavior Scale, the total number of behaviors students reported engaging in was significantly associated (OR = 1.24; $P \leq .0001$; 95% CI: 1.18, 1.30) with GLB orientation (Figure). For example, students reporting to have engaged in four separate health risk or problem behaviors were 4.96 times more likely to report being GLB than students who had not engaged in any health risk behaviors. Approximately 50% of GLB respondents reported engaging in more than five risk behaviors compared with <25% of the non-GLB respondents. The mean number of behaviors engaged in by GLB respondents was 6.81 +/- 4.49 compared with 3.45 +/- 3.15 among the overall population ($P < .0001$). When the "not sure" students were excluded from the analysis, the relationship remained unchanged ($P < .0001$). When gay and lesbian respondents were compared with bisexual respondents, there was not a significant ($P = .94$) difference in the total number of risk behaviors in which each student had engaged.

DISCUSSION

As a result of a variety of social, psychological, and socioeconomic factors, adolescents engage in risktaking in an attempt to accomplish developmental milestones such as seeking independence from parental figures and receiving social acceptance from peers, etc. Accordingly, adolescent risk-taking should be viewed within the context of normal development. Taking risks and experimenting with adult roles are essential to normal adolescent development and can be accomplished with positive or healthy behaviors. Jessor defines risk behaviors as those behaviors that compromise adolescent health, life, and successful development.¹⁶ He proposes a covariation among risk behaviors that cluster to form a risk behavior syndrome.¹⁶ Although covariation exists among both problem and nonproblem behaviors, the evidence for covariation is strongest among problem behaviors, including drug use, violence, delinquency, and sexual activity.¹⁶ Individuals who engage in multiple problem behaviors during early adolescence are at greatest risk of developing a syndrome of problem behaviors.¹⁶

Homosexual, bisexual, and other adolescents confronting issues of sexual expression or orientation have been identified as facing stresses including emotional isolation, social rejection, and lowered self-esteem.⁴ The complex components of sexual orientation, including fantasies, feelings, behaviors, attractions, and cultural affiliations, often are quite difficult to manage. These issues challenge many adolescents' emotional and psychological development and most likely contribute to the risk of developing the syndrome of risk behaviors that Jessor describes. According to estimates, at least 1 in 10 teenagers struggles with issues regarding sexual orientation.⁷ Sexual orientation is an individual's pattern of physical and emotional arousal toward members of the same and/or opposite gender.--8

Many homosexual adults and adolescents report a sense of "differentness" during childhood.^{7,9,10} Commonly dichotomized as either heterosexual or homosexual, Kinsey maintained that most individuals are somewhere in between, not absolutely one or the other.⁷ There is considerable debate concerning Kinsey's hypothesis as well as about the nature versus nurture determinants of sexual orientation, and there is a lack of scientific evidence to draw strong conclusions at this time.⁶ Sexual orientation should not be confused with other aspects of sexuality such as gender identity, gender role, or sexual behavior. Of particular importance regarding homosexuality among adolescents is the difference between sexual behavior, experimentation, and sexual orientation. Heterosexual youth may have or have had same-gender sexual experiences. Gay or lesbian youth may have opposite-gender sexual experiences or may abstain from sexual activity altogether.⁶

Previous research has shown an association between GLB orientation and a variety of risk behaviors including suicidal ideation and attempts, substance use, and sexual risk behaviors.^{1,4,5,11-14} Studies indicate GLB youth face violence and victimization both in school and at home.⁴ However, many previous studies have been challenged from a traditional methodologic perspective by relying largely on self-selected populations or extrapolating retrospective data from homosexual adults.⁴ Representative, population-based data has been published regarding sexual behavior, yet this is neither a specific nor a sensitive predictor of self-identified sexual orientation.^{6,8,15} In 1995, Massachusetts modified its version of the CDC YRBS to include a question addressing sexual orientation. This provided a unique opportunity to evaluate multiple health risks and problem behaviors among an anonymous, representative sample of GLB adolescents who self-identified during high school. Using the survey, this study found 2.5% of the overall student population self-reported GLB orientation. Of the additional 1.5% of the study population who responded "not sure", there is not a way to determine which students were truly unsure of their sexual orientation versus which were confused about the question itself or possible responses. We also have no way of determining what proportion of the "not sure" students will later identify as heterosexual, bisexual, gay, or lesbian. Other demographic information revealed that among white, black, and Hispanic respondents, there were no significant differences between the GLB and overall student populations. In addition, although there were no significant age differences between GLB and non-GLB respondents, there was a larger percentage of male respondents among the GLB study population. This is consistent with previous retrospective data that report males self-identifying at earlier ages than do females.¹⁰ In fact, the mean time of self-identification for gay and bisexual male adolescents interviewed in Minnesota was 14 years.²¹

Regarding individual risk behaviors, in support of previous studies, the GLB youth in our study reported more frequent psychosocial and medical risk behaviors, including school problems, substance use, suicide attempts, violence, victimization, and sexual risk behaviors. According to the bivariate analyses, in comparison with non-GLB respondents, this subsample of GLB youth was more than three times as likely to have attempted suicide in the past 12 months, almost five times as likely to have missed school because of fear about safety, more than nine times as likely to have used injectable drugs in their lifetime, and more than four times as likely to have been threatened with a weapon on school property. In addition, GLB respondents were more likely to have reported sexual intercourse in their lifetime and to have had an increased number of sexual partners, and were more likely to have experienced sex against their will. The logistic regression models indicate that as the frequency of engaging in risk behaviors increases, the magnitude of the association between self-reported GLB orientation also increases. Previously unreported, our findings suggest that in this subset of GLB youth that self-identifies during high school, GLB orientation is associated with an increased likelihood to initiate sexual intercourse and to engage in cocaine, marijuana, and tobacco use before age 13.

The findings presented in this study support Jessor's Problem Behavior Theory as related to GLB adolescents. Of this subsample of GLB youth, >50% reported engaging in multiple problem behaviors (more than five total behaviors) that jeopardize their health and successful development. On the Risk Behaviors Scale, GLB respondents engaged in twice the mean number of risk behaviors as did the overall population. By initiating risk behaviors during early adolescence (<13 years of age), GLB respondents appear to be at extremely high risk for developing Jessor's "syndrome of problem behaviors." Jessor proposes that the usefulness of conceptualizing a "syndrome" of problem behaviors is because it addresses the adolescent as a whole rather than as a sum of individual behaviors.^{1b} This directs intervention efforts that are comprehensive, focusing on adolescent lifestyle (environment, personality, behaviors, biology) rather than on individual behaviors. Comprehensive efforts directed toward the GLB adolescent require an understanding of the complexity of sexual orientation and its effect on adolescent development.

There are several limitations to this study. The data collected were part of a cross-sectional survey and, therefore, we can only examine the association between sexual orientation and health risk behaviors and not draw conclusions about causality. Although estimates of these associations may be generalizable to the majority of adolescents who attend public high school, other high-risk youth, such as runaway or homeless youth who do not routinely attend school, are not represented by these data. Unfortunately, secondary to intensified isolation,

rejection, and other psychosocial stressors, this subset of out-of-school youth may face levels of risk that exceed those represented in this study. Additional limitations include regional limitations and difficulties with self-reported data. The population studied is from one state, and regional differences may exist for some behaviors. Studies of national data and representative studies in other states may prove helpful in identifying differences. This analysis was based on self-reported behaviors. It cannot be determined whether the respondents tended to over- or underreport risk behaviors. The YRBS instrument was developed by the CDC, and the validity and reliability of adolescent self-reported behaviors has been discussed previously.¹⁹ However, the validity and reliability of the sexual orientation question remains unclear in part because of social stigma and other pressures of the coming-out process. This may affect self-identifying and subsequent self-reporting of GLB orientation. Our sample of 104 GLB respondents most likely does not include all GLB youth within the study population. It seems likely that such error would underreport rather than overreport GLB respondents. For a variety of reasons, particularly the "not sure" and "none of the above" respondents, as well as those who failed to answer the sexual orientation question altogether, the GLB study population may not represent accurately all students confronting issues of sexual orientation. Although gender differences did not significantly affect, and race/ ethnicity did not significantly alter, the relationship between GLB orientation and risk behaviors presented in this study, additional research is needed to examine more closely the influence these and other variables have on patterns of risk behaviors among GLB adolescents. Finally, although the YRBS uses a random complex survey design, the statistical software used for this analysis, SPSS, assumes data collection with simple, random sample design. To correct for the violation of this assumption, hypotheses were tested at the .001 probability level, and only variables significant at the $P < .0001$ level were included in the multiple regression models. Thus, the likelihood of committing type I error was very small. Use of other software design for complex surveys would not have affected the results of the study.

Although this study identifies a subsample of GLB youth that is disproportionately at risk for a number of negative health outcomes and risk behaviors, it is important to realize that the majority of GLB youth cope with a variety of stressors to become healthy and productive adults. GLB youth, such as those who have not used drugs or initiated sexual activity, as well as those who may not self-identify until adulthood, may not have the same high-risk profile as our study population. Yet, at 2.5% of the overall student population, this sizable minority remains at high risk and often is hidden or invisible in part because of social stigmas regarding homosexuality. Incorporating Jessor's proposal for comprehensive efforts aimed at adolescent lifestyles to best address the needs of this high-risk GLB population, educational efforts must be aimed at destigmatizing homosexuality, addressing homosexuality within the context of adolescent development, and identifying individuals at risk of potentially physical and psychological injurious acts.¹⁶ Efforts should be directed not only at individuals at risk, but at fellow students, faculty, administration, and families. Our findings suggest that this subsample of GLB youth is more likely to initiate risk behaviors before age 13, and therefore intervention efforts may need to be targeted toward younger children and adolescents. Studies have shown that among GLB youth, a gay or lesbian friend is often the most important person in their life. Therefore, the importance of peer-based support and education cannot be minimized in efforts to assist GLB youth. Offering a chance to learn and practice social skills, exchange information, establish friendships and positive role models, peer support groups address the isolation, rejection, and social impediments to the healthy development of GLB youth.

Pediatric and adolescent health care providers play a vital role in addressing the comprehensive, complex medical and developmental needs of gay and lesbian youth.^{3,4,6-9} Beyond providing primary care, the clinician's role is to facilitate an adolescent's healthy sexual development. Open and nonjudgmental history-taking as well as discussions of sexual orientation as a complex interaction of behavior, attractions, and self-labeling may help overcome a patient's fears or confusions.⁷ Astute clinicians can serve not only as resources of information, but also as confidantes for school or family stresses that confront and overwhelm some GLB youth. Youth with multiple psychosocial or medical problems can be identified for counseling or referral to mental health, social service, or medical specialists.

As a representative population-based study, our findings more clearly define the risks and difficulties facing GLB youth and provide an initial step toward causal understanding. They provide an opportunity for additional research and provide valuable information regarding adolescent challenges with sexual orientation. Increasing awareness of these public health concerns may help clinicians, advocates, and policymakers promote community, state, or national efforts aimed at ensuring the health and well-being of GLB youth.

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TABLE 2.

TABLE 3.

Figure.

We thank the faculty and fellows of the Division of General Pediatrics at Children's Hospital; the staff of the Sidney Borum Jr. Health Center; Elizabeth Woods, MD, MPH; Leonard Rappaport MD; and the Massachusetts Department of Education for their support and comments.

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