

Bacterial STDs and Perceived Risk Among Sexual Minority Young Adults

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CONTEXT: Most sexual health interventions focus on heterosexual sexual risk behavior. Health practitioners face a lack of information about the sexual health of sexual minority young adults (aged 18–26).

METHODS: Three indicators of sexual minority status (identity, behavior and romantic attractions) were assessed in 10,986 young adults who participated in Wave 3 of the National Longitudinal Study of Adolescent Health (2001–2002). Logistic regression analyses examined associations between these indicators and individuals' perceived risk for STDs and actual infection with STDs. Data from the 1,154 respondents who had current or recent bacterial STDs were investigated further to determine whether they had underestimated their risk.

RESULTS: Outcomes varied by sexual minority status indicator and by sex. Bisexual females had significantly higher odds of STDs than heterosexual females (odds ratios, 1.4), and females attracted to both sexes had significantly higher odds of STDs than females attracted only to males (1.8). In contrast, none of the sexual minority status indicators predicted STDs for males. Among respondents who had an STD, females who reported only same-sex sexual relationships were more likely to believe they were at very low risk for STDs than were females reporting only opposite-sex sexual relationships (17.2); homosexual females had a higher likelihood of this outcome than heterosexual females (19.7).

CONCLUSIONS: Health practitioners need to assist sexual minority young adults, particularly females, in understanding their risk for STDs and in taking safer-sex precautions.

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STDs are a major health concern during the transition to adulthood. Young adults—those aged 18–26—have much higher rates of STD infection than older adults.¹ As they enter their most productive childbearing years, STDs can cause substantial problems, such as infertility and pregnancy complications.^{2,3} Although most national surveillance data do not include information about sexual minority status, some indicators suggest that STD rates among some sexual minority groups may be increasing.¹ The threats posed by STDs for reproductive health have inspired many sexual health interventions, but most have focused on heterosexual sexual risk behavior. The invisibility of sexual minorities and sexual minority issues in many sex education and intervention programs may leave these groups vulnerable to STDs and to misperceptions about their level of risk. In addition, the lack of representative information about sexual health outcomes among sexual minority young adults leaves health practitioners with little guidance in understanding threats to the sexual health of these patients. In this study, we aim to clarify how sexual minority status relates to sexual health and perceptions of risk among young adults.

Sexual Health Research Among Sexual Minorities

Although information on the sexual health status of sexual minorities is limited, the existence of many studies examining risky behaviors among sexual minority

subgroups clearly implies some concern by researchers about elevated risks, particularly for men who have sex with men.^{4,5} This behavioral research highlights the importance of understanding how sexual minority men perceive risks. For example, young men who have sex with men may engage in more risky sexual behaviors than older men because they are less likely to be close to individuals with HIV and therefore they perceive less risk than older men.⁶ Although men who have sex with men have been targeted in HIV and AIDS prevention research, they have not been the focus of research on other STDs. Consequently, health practitioners lack data on the sexual health status of sexual minority men and on how those men understand the risks they face.

Literature on the sexual health status of lesbians and bisexual women is exceedingly rare, which makes it difficult for health practitioners to adequately serve this population.⁷ Some behavioral research indicates that sexual minority women may not use protection with other women because they see no risk.⁸ Furthermore, health practitioners may believe that sexual minority women do not need screening or sexual health education.^{9,10} However, it is not uncommon for both lesbian and bisexual women to have had unprotected intercourse with a man.^{11–13} Thus, practitioners clearly need better guidance on the prevalence of STDs among sexual minority women and on how these women perceive their risks.

Although some studies have requested self-reports of STDs,^{1,14} to our knowledge, current, representative information on biological testing for STDs among sexual minority young adults has not been published. Using self-reports alone may substantially misrepresent the prevalence of infection because many STDs are asymptomatic;¹⁵ additionally, their use may introduce bias in study results because diagnosis depends on access to health services. The use of biological testing for STDs in research with sexual minorities would help clarify the associations with actual sexual health status.

Sexual Minorities and the Transition to Adulthood

Developmental theorists have increased their focus on young adulthood as a critical transitional period that emphasizes identity explorations and experimentation with increasing levels of independence. The development of longer term partnerships and greater intimacy within relationships has been identified as a central task of this period,^{16,17} through which young adults gradually progress toward a more enduring understanding of their sexual identities.

Most theories explaining the emergence of sexual identity focus on progression through various stages of development; this process may be particularly salient for sexual minority individuals. For example, Troiden has posited a four-stage model that begins during adolescence with “sensitization” and “identity confusion.”¹⁸ By early adulthood, many individuals enter an “identity assumption” stage, when they begin to define themselves as sexual minorities either privately or to trusted friends. Gradually, they may disclose to more people and enter the fourth stage, “commitment”; at this point, they integrate their private identity with their public identity, often becoming more immersed in the gay, lesbian or bisexual community. However, other theorists believe that the developmental process is more fluid.¹³ In addition, sexual experimentation and exploration may be an indication not of a sexual minority identity, but of risk-taking in general.¹⁹

Developmental issues among young adults, coupled with the complexities of defining and operationalizing sexual minority status, have resulted in gaps in the literature on young adult sexual health. Cultural pressures, respondent confusion and stigma can all make measurement difficult in the field. Indicators have included self-reported identities and reports of same-sex sexual relationships and romantic attractions. Each of these indicators has various weaknesses when used alone. For example, self-reported identities will include only sexual minorities who are willing to apply traditional labels to themselves.²⁰ Furthermore, same-sex romantic attractions, sexual relationships and self-reported sexual identity may not be strongly related.²¹ Thus, theoretical and empirical evidence supports the use of multidimensional measures of sexual minority status.

Research Questions

Overall, there is considerable need for additional studies on how sexual minority young adults perceive their sexual risk and whether their perceptions are consistent with the actual prevalence of negative sexual consequences among both males and females. Therefore, in this study, we examined how different dimensions of sexual minority status are associated with sexual health outcomes among young adults. Specifically, we determined how self-reported identity, romantic attractions and sexual relationships are associated with infection with bacterial STDs and perceived risk for bacterial STDs.

METHODS

Sample

Data used in these analyses are from the contractual data sets of Wave 3 of the National Longitudinal Study of Adolescent Health (Add Health). Add Health is an ongoing study of health-related behaviors among a nationally representative sample of men and women. Add Health began with a stratified probability sample of all high schools in the United States, in which more than 90,000 adolescents in grades 7–12 completed questionnaires. A representative subsample was selected for in-depth, in-home interviews, which used audio computer-assisted self-interview technology to collect information about sensitive topics. More than 20,000 Wave 1 in-home interviews were completed in 1995. One year later, Wave 2 in-home interviews were completed. Wave 3 in-home interviews were conducted in 2001–2002, when participants were between 18 and 26 years old. At Wave 3, respondents were also asked to provide a urine specimen for assay tests to detect *C. trachomatis*, *N. gonorrhoeae* and *T. vaginalis*. This study is a cross-sectional analysis of data from Wave 3.

Of the 14,322 respondents assigned Wave 3 weights by Add Health, 10,986 (77%) had complete data of interest; most missing data were attributable to respondents' lacking results for the STD laboratory tests. This study was approved by the Virginia Tech institutional review board.

Measures

STDs were assessed in two ways. Respondents were asked whether, in the past 12 months, they had “been told by a doctor or nurse” that they had chlamydia, they had gonorrhea or they had trichomoniasis. Current infection with any of these STDs was assessed through testing the respondents' biological samples. Young adults who either reported having had an STD or had a positive test result were coded as having a current or recent bacterial STD.

To measure their perceived risk, respondents were asked what the chance was that they currently had gonorrhea or chlamydia when their biological samples were collected. Responses ranged from a “very low chance” to a “very high chance.” Respondents who rated their chances of having an STD as anything other than very low were classified as believing they had a chance of having a bacterial STD.

TABLE 1. Percentage distribution of a sample of respondents to Wave 3 of the National Longitudinal Study of Adolescent Health, by selected characteristics

| Characteristic | % (N=10,986) |
|--|-----------------|
| Current/recent bacterial STD | |
| Yes | 9.3 |
| No | 90.7 |
| Perceived risk of having bacterial STDs | |
| Any | 13.1 |
| Very low | 86.9 |
| Gender | |
| Female | 49.6 |
| Male | 50.4 |
| Race or ethnicity | |
| White | 69.2 |
| Black | 15.8 |
| Hispanic | 10.7 |
| Asian | 3.5 |
| Native American | 0.8 |
| Sexual relationships | |
| Opposite-sex only | 81.8 |
| Both sexes | 1.5 |
| Same-sex only | 1.0 |
| None | 15.7 |
| Sexual identity | |
| Heterosexual | 89.3 |
| Bisexual | 9.5 |
| Homosexual | 0.8 |
| None | 0.4 |
| Romantic attractions | |
| Opposite-sex only | 88.3 |
| Both sexes | 8.8 |
| Same-sex only | 0.7 |
| None | 2.1 |
| Total | 100.0 |

Notes: The survey was conducted in 2001–2002, when respondents were 18–26 years old. Respondents with missing information are excluded from the analytic sample. Percentages may not add to 100.0 because of rounding.

Sexual minority status was determined by three measures. First, respondents were asked to report on all sexual relationships occurring in the last five years. Sexual relationships were defined as ones in which respondents reported having had vaginal, oral or anal sex with their partner. Information on the sex of each partner and sex of the respondent was combined to create four categories of sexual relationships: opposite-sex only, same-sex only, both same- and opposite-sex, and none. Next, sexual identity was constructed from the item “Please choose the description that best fits how you think about yourself,” for which possible responses were “100% heterosexual,” “mostly heterosexual,” “bisexual,” “mostly homosexual,” “100% homosexual” or “no orientation” (not sexually attracted to either males or females). Respondents who chose mostly heterosexual, bisexual or mostly homosexual responses were categorized as bisexual. Finally, respondents were asked if they had ever had a romantic attraction to a male and if they had ever had such an attraction to a female. This information, combined with the sex of the respondent, allowed for the creation of four categories

of romantic attraction: opposite-sex only, same-sex only, both same- and opposite-sex, and none.

The demographic characteristics included were respondents’ self-reported age, biological sex, and race or ethnicity.

Analysis

Stata (version 9.2) was used to incorporate weights and account for Add Health’s sampling design in all analyses, as recommended by the Add Health research team.^{22,23} To examine whether the three indicators of sexual minority status were differentially associated with having a bacterial STD and with perceived risk of infection, we ran logistic regression analyses (separately for males and for females) that controlled for age, race and ethnicity. We were also interested in whether infected individuals would recognize that they had a chance of being infected. Therefore, we examined a subsample of 1,154 respondents who tested positive for chlamydia, gonorrhea or trichomoniasis, or reported having received a diagnosis of any of these STDs within the past year, to determine if sexual minority indicators were associated with infected individuals’ believing they had a “very low chance” of having an STD, as this would indicate they were underestimating their risk of infection. In addition, because odds ratios can be difficult to interpret for outcomes that have high probabilities, we calculated probabilities to illustrate the meaning of some significant results at the individual level.

RESULTS

On average, respondents were 21.8 years old at Wave 3. Nine percent had had a bacterial STD in the past year or tested positive for one at the time of the survey (Table 1). Only 13% of the sample believed they had a chance of having a bacterial STD. Three percent of respondents reported same-sex sexual relationships in the past five years. Eighty-nine percent identified themselves as heterosexual, 10% as bisexual and fewer than 1% as homosexual. While 2% of respondents reported no attractions to either sex, 9% were attracted to both sexes, and fewer than 1% to the same sex only.

Bisexual females had significantly higher odds of having a bacterial STD than heterosexual females (odds ratio, 1.4—Table 2), while females attracted to both sexes had significantly higher odds of having a bacterial STD than females attracted only to males (1.8). Notably, no measure of sexual minority status predicted bacterial STDs for males.

Sexual minority status measures predicted perceived risk of bacterial STDs for both females and males. Females who had had sexual relationships with both sexes had higher odds of believing they were at risk of bacterial STDs than females who had been in sexual relationships only with males (odds ratio, 2.3). Bisexual females had higher odds than heterosexual females of believing they were at risk (1.9), and females who were attracted to both sexes had higher odds of perceiving risk than those attracted only to

males (1.6). Among males, those who reported no sexual relationships had lower odds of considering themselves at risk for a bacterial STD than males reporting only female partners (0.7). Bisexual males had higher odds than heterosexual males of believing they had a chance of having an STD (2.0), and males who were attracted to both sexes or only to males had higher odds of believing they were at risk than males attracted only to females (2.2 and 2.6, respectively).

Among respondents with current or recent bacterial STDs, 71% believed they had a very low chance of having one. The odds that females who had an STD considered themselves at very low risk of having an STD were highly elevated among those who reported only same-sex sexual relationships compared with those who reported only opposite-sex sexual relationships (odds ratios, 17.2—Table 3), and among homosexual females compared with heterosexual females (19.7); both findings indicate an inaccurate understanding of risk. In contrast, men reporting attraction to both sexes had lower odds of underestimating their risk than those attracted only to women (0.3), indicating a more accurate understanding of risk.

To aid in the interpretation of outcomes with high probabilities, we calculated the following sample probabilities: An 18-year-old white homosexual female with an STD had a 98% probability of thinking that she was at very low risk, whereas a heterosexual female with the same characteristics had a 71% probability. A white 18-year-old female with an STD who reported only same-sex attractions had a 97% probability of thinking that she was at very low risk, whereas an 18-year-old white female who reported only opposite-sex attractions had a 71% probability.

DISCUSSION

Different dimensions of sexual minority status showed different patterns of association with sexual health outcomes for males and females. Bisexual identity and attraction to both sexes predicted elevated odds of bacterial STDs for females, but no measure of sexual minority status was significant for males. Among both males and females, bisexuals and those attracted to both sexes had elevated odds of believing they had a chance of having an STD. However, among respondents who had a bacterial STD, females who reported only same-sex partners or who identified as homosexual underestimated their risk of having an infection.

Perceptions of health risks are particularly important when dealing with STDs because many infections are asymptomatic. The fact that seven out of 10 individuals with a bacterial STD characterized their chance of having an STD as very low has serious implications for sexual health policy and practice. Ideally, infected individuals would recognize that they had a high chance of being infected so that they could take steps to pursue a diagnosis, obtain treatment and contain the infection. A disconnect between a person's perceived risk and actual health could heighten an individual's risk of spreading infection.

TABLE 2. Odds ratios (and 95% confidence intervals) from logistic regression analyses assessing the likelihood that young adults had a current or recent bacterial STD and that they perceived themselves to be at any risk for STD, by sexual minority status indicator, according to sex

| Indicator | Bacterial STD | | Perceived any risk | |
|-----------------------------|-------------------|-------------------|--------------------|-------------------|
| | Females (N=5,174) | Males (N=5,812) | Females (N=5,174) | Males (N=5,812) |
| Sexual relationships | | | | |
| Opposite-sex only (ref) | 1.00 | 1.00 | 1.00 | 1.00 |
| Both sexes | 1.16 (0.59–2.26) | 2.36 (0.71–7.89) | 2.28 (1.33–3.93)* | 1.87 (0.47–7.51) |
| Same-sex only | 1.04 (0.11–9.52) | 0.79 (0.28–2.21) | 0.26 (0.04–1.61) | 2.01 (0.90–4.49) |
| None | 0.88 (0.67–1.16) | 0.82 (0.57–1.18) | 0.82 (0.59–1.13) | 0.74 (0.56–0.97)* |
| Sexual identity | | | | |
| Heterosexual (ref) | 1.00 | 1.00 | 1.00 | 1.00 |
| Bisexual | 1.44 (1.04–2.00)* | 0.87 (0.41–1.85) | 1.87 (1.40–2.50)* | 2.03 (1.27–3.22)* |
| Homosexual | 1.76 (0.15–20.26) | 0.98 (0.34–2.84) | 0.85 (0.22–3.26) | 1.99 (0.79–5.03) |
| None | 2.21 (0.89–5.48) | 3.85 (0.62–23.87) | 1.65 (0.56–4.87) | 2.38 (0.56–10.18) |
| Romantic attractions | | | | |
| Opposite-sex only (ref) | 1.00 | 1.00 | 1.00 | 1.00 |
| Both sexes | 1.78 (1.20–2.62)* | 0.96 (0.47–1.93) | 1.58 (1.16–2.16)* | 2.21 (1.47–3.33)* |
| Same-sex only | 2.49 (0.41–15.18) | 0.79 (0.26–2.43) | 0.99 (0.26–3.83) | 2.60 (1.05–6.42)* |
| None | 0.96 (0.46–2.00) | 1.96 (0.96–4.00) | 0.78 (0.34–1.81) | 1.16 (0.60–2.26) |

*p<.05. Notes: All models control for age and race or ethnicity. ref=reference group.

Our finding that some sexual minority females underestimate their sexual risk highlights the need for improved communication. Health care providers should not make assumptions about sexual risk behaviors on the basis of a patient's self-reported sexual identity; rather, they should take a careful sexual history of sexual minority patients and provide safer-sex information to all patients. Sexual minorities may have particular difficulty communicating with their physicians, and physicians may be uncomfortable interacting with sexual minority patients.^{24,25} This study emphasizes a critical need for health care providers to overcome those barriers when counseling female sexual minority patients about sexual health, even when no male partners are reported. Because stigmatized

TABLE 3. Odds ratios (and 95% confidence intervals) from logistic regression analyses assessing the likelihood that young adults with bacterial STDs underestimated their STD risk, by sexual minority status indicator, according to sex

| Indicator | Females (N=720) | Males (N=434) |
|-----------------------------|----------------------|-------------------|
| Sexual relationships | | |
| Opposite-sex only (ref) | 1.00 | 1.00 |
| Both sexes | 0.88 (0.21–3.78) | 0.66 (0.05–7.90) |
| Same-sex only | 17.19 (1.07–277.66)* | 0.38 (0.04–3.31) |
| None | 0.95 (0.50–1.79) | 0.78 (0.38–1.63) |
| Sexual identity | | |
| Heterosexual (ref) | 1.00 | 1.00 |
| Bisexual | 0.95 (0.49–1.82) | 2.25 (0.47–10.70) |
| Homosexual | 19.70 (1.22–318.14)* | 0.71 (0.05–10.53) |
| None | 1.30 (0.18–9.62) | 0.11 (0.01–2.58) |
| Romantic attractions | | |
| Opposite-sex only (ref) | 1.00 | 1.00 |
| Both sexes | 0.93 (0.54–1.61) | 0.30 (0.10–0.97)* |
| Same-sex only | 0.56 (0.06–5.49) | 0.56 (0.04–8.72) |
| None | 0.43 (0.13–1.38) | 0.88 (0.19–4.02) |

*p<.05. Notes: All models control for age and race or ethnicity. ref=reference group.

sexual behaviors that are characteristic of sexual minority relationships may be unplanned or occur under risky circumstances,²⁶ health practitioners can play an important role in helping sexual minority young adults to think ahead about safer-sex precautions.

The findings that some groups of sexual minority women had elevated risks of having bacterial STDs and of underestimating their risk also point to serious gaps in our public narrative on STD transmission. For example, current sexual health curricula in the United States rarely address the needs of sexual minorities.²⁷ This lack of information may provide sexual minority students with a false sense of security or a false sense of danger. Communication barriers with care providers and a lack of information for providers about sexual minorities may exacerbate the situation. To facilitate a more accurate perception of risk among sexual minorities, health practitioners can work to promote the development and implementation of more effective curricula and to break down some of the stigma and barriers in communication about sensitive sexual behaviors in public health services and physician offices.

Limitations and Strengths

The study has several notable limitations. This analysis is an exploratory examination using cross-sectional data, which precludes causal inference. Furthermore, the multiple measures of sexual minority status reflected different time frames: Identity reflected the respondent's current status, while sexual relationships reflected experiences over the past five years, and romantic attraction was a lifetime measure. Thus, differences across measures may reflect the different time ranges.

These results are based on young adults and should not be generalized too broadly; the developmental stage of the respondents must be considered in interpreting the results. For example, sexual minority young adults may not have had as much opportunity to establish same-sex relationships as older adults. Longitudinal explorations of sexual health practices and sexual minority status across developmental stages are needed to identify potential opportunities for intervention. In addition, some measures in this study are based on self-reports, as objective measures of sexuality and sexual behavior are difficult to obtain. However, the use of multiple measures can improve not only the reliability but also the content validity of self-reported sexual minority status. Lastly, even though we used a very large national data set, in some subgroups, such as respondents who have an STD, the number of individuals who are sexual minorities is small, making it difficult to get precise estimates.

Despite these limitations, Add Health provides a unique source of rich contextual data for a large representative sample, including a substantial number of sexual minority participants. This is an important advantage in an area of study in which researchers have historically relied on clinical and convenience samples.²⁸ Also, few studies on the sexual health of sexual minorities have included

women or focused on STDs other than HIV. This study makes an important contribution by including men and women who have undergone biological testing of STD status.

Conclusion

Our study provides new insight into the links between sexuality, risk perception and sexual health outcomes. The findings demonstrate that no one measure is sufficient to capture sexual minorities and that different dimensions have different utility in predicting sexual health outcomes; studies relying on just one indicator may detect only part of the complex relationship between sexuality and health. In the past decade, the research community has increasingly recognized the need for more sophisticated measures of sexual minority status.^{29–31} The next step will be to examine these associations longitudinally to determine how different dimensions of sexual minority status are associated with sexual health outcomes over a lifetime.

Health practitioners need to consider how they might assist sexual minority patients, particularly homosexual and bisexual females, in identifying and understanding their risk for STDs. Sex education courses that cover issues relevant to sexual minorities and other possible modes of intervention should be explored to reduce health inequities and improve individual understanding of risk. Furthermore, future research should consider how representative samples with multidimensional measures of sexuality can add depth to our understanding of sexual minority status and health.

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