RESEARCH

Examining Behavioral and Psychosocial Predictors of Antibody Testing among College Youth: Implications for HIV Prevention Education and Testing

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Young adults continue to be disproportionately affected by HIV and AIDS. Despite efforts, antibody testing rates have remained stable. Utilizing a sample of 1,874 students from three universities and seven instruments, this study examined hypothesized demographic, behavioral, and psychosocial predictors of HIV antibody testing. Logistic regression indicated that sexual regulation, depression, attributional style, drug and alcohol use/abuse, HIV knowledge, and sexual risks significantly predicted the likelihood of testing among students. Comprehensive HIV prevention approaches among youth must examine the impact of personal and health locus of control and mood state, among other factors, on health promoting and protective behaviors.

KEYWORDS HIV, prevention, young adults, testing

INTRODUCTION

Almost three decades since its discovery, HIV/AIDS remains an urgent challenge to public health. An estimated 1.37 million AIDS cases, and approximately 655,000 AIDS-related deaths, will be reported to the Centers for Disease Control and Prevention (CDC) through 2012 (Stine, 2012). While 58% of all documented AIDS cases in the United States have occurred among male homosexuals/bisexuals, the epidemic has increasingly affected persons of all
olds report ever having been tested (CDC, 2010). Further, a paltry 25% of college students report being tested for HIV antibodies (American College Health Association, 2012).

Although risk perception has been shown to influence health-related choices (Glanz, Rimer, & Viswanath, 2008), there are great disparities between college students' behaviors and their perceptions of HIV risk. More than 40% of students binge drink, a behavior that is strongly predictive of risky sexual behavior (Core Institute, 2011; Griffin, Umstattd, & Usdan, 2010). Further, only 50.7% of sexually active students reported using a condom or other protective barrier when engaging in vaginal intercourse (American College Health Association, 2012). Despite such behaviors, the percentage of college students who perceive themselves as significantly less vulnerable to HIV than others has remained stable (Teague, 2009). Adefuye, Abiona, Balogun, and Lukobo-Durrell (2009) found that only 46% of college students reporting inconsistent use of condoms perceived themselves to have a moderate to good chance of being infected with HIV. One-third of those who reported prior alcohol or drug use indicated a strong perception of risk.

Prior research has identified both demographic and behavioral factors specifically related to HIV testing. Female gender, younger age, and race have been positively associated with HIV testing (Bond, Lauby, & Batson, 2005; Burchell et al., 2003; Wang, Li, Stanton, & McGuire, 2010). Greater knowledge regarding HIV and a history of injection drug use were further predictors (Burchell et al.; Gage & Ali, 2005). Research associating sexual risk behavior and HIV testing has shown mixed findings (Wang et al.).

Although results of the aforementioned research may assist in the development of effective interventions aimed at HIV testing as a whole, there is a paucity of research that specifically addresses determinants of testing among college students. Further, while numerous psychosocial factors have been examined with regard to their impact on HIV-related risk behavior, little is known about their impact on HIV testing (Hou & Wisenbaker, 2005). The purpose of this study was to examine HIV testing behavior among sexually active college students and examine socio-demographic, behavioral, and psychological factors associated with HIV testing. At a time when more than half of college students exhibit risky behavior for HIV, identifying and addressing individual and behavioral factors that promote voluntary HIV testing is paramount to the development and delivery of targeted HIV testing programs among sexually active college students (Lewis, Miguez-Burbano, & Majow, 2009).

METHODS

Study Sample and Data Collection

Eligible participants were men and women enrolled in elective health courses (e.g., Human Sexuality, Personal Wellness, and Nutrition) at three large
reliability was .81. Aggregate scores, generated by summing the weighted scores to each item, can range from 0 to 29, with higher scores indicating greater behavioral risks for alcoholism. The 20-item DAST, originally designed to provide a brief instrument for clinical screening and treatment evaluation, examined the use and consequences of both illegal and prescription drugs. The DAST total score, computed by summing all items endorsed in the direction of increased drug use problems, can range from 0 to 20. The instrument has proven to be highly reliable, with alpha scores ranging from .86 to .95 (Skinner, 1982). Reliability of the instrument in the present study was .78.

HIV-related sexual risk behavior was assessed by the University of California San Francisco Center for AIDS Prevention Studies Sexual Behaviors Questionnaire (Chesney, Folkman, & Chambers, 1996). The 20-item scale asked respondents to report the number of persons they had engaged in sexual activity with during the preceding three months. In addition, participants were asked to respond to dichotomous (yes/no) items related to condom usage, and insertive and receptive anal, oral, and vaginal intercourse (e.g., “During the past three months, have you had receptive oral sex without a condom?”) Summary scores were calculated based upon responses to all items involving unprotected oral, anal, and vaginal sex. Scores could range from 0 to 22, with higher scores indicating greater participation in HIV-related sexual risk.

Three instruments were utilized in an effort to ascertain participants’ emotional well being. Prior research has indicated an association between depression and riskier sex, as depression may impact one’s ability to negotiate safer sex, initiate harm reduction strategies, or engage in risky sex as a form of self-harming behavior (Beck, McNally, & Petrik, 2003). As such, the Center for Epidemiological Studies Depression Scale (CES-D) was used in an effort to address depressive symptomatology among nonclinical respondents (Radloff, 1977). Previous studies among college students have found this item to be both valid and reliable, with alpha coefficients as high as 0.86 (Zawawi & Hamaideh, 2009). This eight-item instrument asked respondents to indicate the frequency in which major components of depression (e.g., depressed mood, feelings of helplessness and hopelessness) occurred in the prior seven days, with responses ranging from “rarely or none of the time” to “most or all of the time.” Summary scores could range from 0 to 24, with higher scores indicating a greater degree of depressive symptomatology.

Individuals have a cognitive predisposition to explain the causes of events in a habitual manner, which has been shown to influence emotions, cognition, motivation, and future behavior (Shapcott & Carron, 2010). These explanatory or attributional styles have been linked to health-related issues, including depression and illness (Fresco, Alloy, & Reilly-Harrington, 2006; Peterson et al., 2008). The Attributional Style Questionnaire (ASQ) was used to examine the degree to which respondents attributed life events to internal,
A total of 1,322 women and 552 men participated in the study (Table 1). The age range of participants was 16–54, with a mean age of 19.6. The majority of participants were Caucasian. More than one-third of female participants and one-fifth of male respondents indicated a prior history of counseling. More than two-thirds of respondents had engaged in sexual activities in the prior three-month period. Women were significantly more likely than men to have ever taken an HIV test (19.6% vs. 16.9%, p < .001). Although sexual orientation was included in the demographic questionnaire, it was determined that the sample size of sexual minority respondents (n = 77, 4.1%) was not large enough to provide an appropriate degree of statistical power. As such, comparisons based upon sexual orientation were not conducted. This was also true of transgender students (n = 4, 0.2%). This does not, however, discount the importance of research and prevention efforts among sexual minority and transgender college students.

Results of independent samples t-tests revealed that female respondents experienced significantly greater depressive symptomatology (p < .001) (Table 2). This finding is consistent with prior research indicating higher

<table>
<thead>
<tr>
<th>TABLE 1 Socio-demographic characteristics of student respondents (N = 1,874)</th>
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<tbody>
<tr>
<td><strong>Sex</strong></td>
</tr>
<tr>
<td><strong>Males (n = 552)</strong></td>
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<tr>
<td></td>
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<tr>
<td><strong>Race/Ethnicity</strong></td>
</tr>
<tr>
<td>Caucasian</td>
</tr>
<tr>
<td>African American</td>
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<tr>
<td>Asian/Pacific Islander</td>
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<tr>
<td>Other</td>
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<tr>
<td><strong>History of Counseling</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Sexually Active in Last 3 Months</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Sexual Orientation</strong></td>
</tr>
<tr>
<td>Heterosexual</td>
</tr>
<tr>
<td>Homosexual</td>
</tr>
<tr>
<td>Bisexual</td>
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<tr>
<td><strong>History of HIV Testing</strong></td>
</tr>
<tr>
<td>Yes</td>
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<tr>
<td>No</td>
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likelihood of drug use and/or abuse (p = .003 and .000, respectively), and a
stronger propensity to engage in HIV-related sexual risk (p = .000 and .019,
respectively). These findings suggest that while students who are tested for
HIV antibodies engage in greater sexual risk taking behaviors, responsibility
is taken for potential negative outcomes, including possible transmission
of infection. The association between test-seeking and depression among
women (p = .040) is consistent with previous research, which has found
strong correlations between emotional distress, risk behaviors, and antibody
testing (Sabato, 2003; Sahay et al., 2007).

While much research has indicated a link between HIV risk behaviors
and concurrent problematic alcohol use, limited efforts have examined the
impact of alcohol use on antibody testing (Reisner et al., 2010). Among males,
those with a history of testing exhibited significantly greater tendencies
ward alcohol use, abuse, and dependence (p = .001). Similarly, Norman,
Devieux, Rosenberg, and Malow (2011) found that those with a history of
alcohol, marijuana, and other illicit drug use were more likely to report a his-
tory of testing. The finding that females who sought testing opportunities had
more knowledge about viral transmission than those who did not seek test-
ing (p = .011) suggests the possibility that, similar to prior research, women
who engage in riskier behaviors may be aware of potential risks, and thus
made an effort to determine their status (Haile, Chambers, & Garrison, 2007).

Simultaneous logistic regression was conducted to assess whether
the seven predictor variables—sexual regulation, depression, attributional
style, drug abuse, alcohol use/abuse, HIV knowledge, and sexual risk
behavior—significantly predicted the likelihood of HIV antibody testing for
both males and females. When all seven variables were considered together,
they significantly predicted whether or not both males and females would
be tested for HIV antibodies ($\chi^2 = 30.36$, df = 7, N = 399, $p < .001$ and
$\chi^2 = 56.50$, df = 7, N = 1,045, $p < .001$, respectively). Odds ratios, pre-
sented in Table 4, suggest that the odds of estimating correctly who will be

<table>
<thead>
<tr>
<th>Variable</th>
<th>Males</th>
<th>Females</th>
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<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$SE$</td>
</tr>
<tr>
<td>Sexually</td>
<td>-.109</td>
<td>.043</td>
</tr>
<tr>
<td>Regulation</td>
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<td>.039</td>
</tr>
<tr>
<td>Depression</td>
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<td>.024</td>
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<td>Attributional Style</td>
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<td>.056</td>
</tr>
<tr>
<td>Drug Use/Abuse</td>
<td>.048</td>
<td>.039</td>
</tr>
<tr>
<td>Alcohol Use</td>
<td>.552</td>
<td>.056</td>
</tr>
<tr>
<td>HIV Knowledge</td>
<td>.163</td>
<td>.060</td>
</tr>
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(Carrico et al., 2010; Ghebremichael et al., 2009). Yet few efforts have addressed the relationship between depression and testing. As such, although not found to be a meaningful predictor of HIV testing, it is noteworthy that women who sought testing had significantly higher levels of depression. Further, a small but significant positive correlation between depressive symptomatology and HIV-related sexual risk was found ($r = .077, p = .008$). This finding is supported by prior research, which has purported that greater emotional distress is associated with enhanced risk behaviors. Among women, depression has been associated with sexual risk-taking practices, such as having multiple sexual partners and inconsistent condom use (Blumberg & Dickey, 2003; Sterk, Theall, & Elifson, 2006).

The finding that students were knowledgeable about HIV transmission, prevention, and treatment is not unexpected. HIV and other STI prevention education are components often used in health and wellness curricula at the high school and secondary school level. Similar to the present study, which found a positive correlation between knowledge and HIV risk among both males and females ($r = .117, p = .000$), prior research has indicated that, while students have superior knowledge on the topic, they continue to engage in high-risk sexual behaviors (Lewis et al., 2009). Because knowledge has been related to a decreased concern about HIV, and subsequently less concern about consistent condom use, it has been hypothesized that a greater depth of knowledge about HIV may in fact heighten the risk of transmission (Lewis et al.).

In the present study, an internal locus of control in a sexual context, a history of alcohol and other drug use, enhanced knowledge regarding patterns of viral transmission and prevention, and a greater propensity to engage in risk-related sexual behaviors predicted a stronger likelihood of HIV antibody testing. However, it is imperative that in addition to these predictors, education and prevention efforts among college students focus prominently on issues of personal susceptibility and risk. Utilizing the Health Belief Model as its foundation, research has found that even when engaging in the risk behaviors discussed previously, preventative or corrective actions may not occur if an individual does not perceive himself or herself to be at risk of a negative outcome (McCoy et al., 2009; Vermeer, Bos, Mbwambo, Kaaya, & Schaalma, 2009). In their study of sexual risk taking among college students, Downing-Matibag and Gelsinger (2009) found that, owing to a greater sense of trust in their partner and their university community as well as a lack of knowledge regarding health impacts of unprotected oral intercourse, only 50% of students had concern about contracting an STI. More alarmingly, less than 5% expressed concern about STIs following oral sex (Downing-Matibag & Gelsinger). Per the present study’s findings, while less than one in five respondents had ever been tested for HIV antibodies, 53% of sexually active men and 44% of sexually active women had engaged in insertive or receptive oral sex without a condom to the point of ejaculation.
in the United States. It is imperative that in addition to classroom and instructional components, institutions of higher learning employ an integrated approach to HIV and other STI prevention education, collectively engaging university health centers, counseling centers, residence life, student affairs programming, and social media outlets. Such approaches should address not only behavioral predictors of risk (e.g., alcohol, drug use) but also the impact of personal and health locus of control health promoting and protective behaviors (e.g., condom use, partner communication and notification). Similarly, prevention approaches must clearly elucidate that risk behaviors enhance susceptibility not only to pregnancy but also viral and bacterial infection. Although such information may not inherently change engagement in risk behaviors, findings from the present study suggest that, at a minimum, it may have a mediating effect upon decisions to access testing, counseling, and referral services. Lastly, creating or bolstering linkages between community and university resources, engaging sexuality educators in multiple capacities (e.g., health fairs, student orientation) would serve to minimize existing service gaps for students in a nonacademic setting.

REFERENCES


