ABSTRACT

This study was conducted to assess the predictors of safe sex practices among a group of college students. Subjects were 261 students attending the evening division of a large urban university campus, 68% of whom were female and 94% of whom reported being heterosexual. The average age of respondents was 26 years. Subjects responded to questions concerning their knowledge about sources of human immunodeficiency virus (HIV) transmission, history of sexual behavior, attitudes toward homosexuality, intravenous drug use, casual sex, Acquired Immune Deficiency Syndrome (AIDS) hysteria, and heterosexual invulnerability to infection. The majority of students knew how HIV was transmitted, but 40.4% responded incorrectly or were unsure about ways in which one cannot be infected. Nine percent of the heterosexual population practiced safer sex although 27% had sexual contact with a high risk group member. A stepwise discriminant analysis using variables hypothesized in the research literature to be associated with practicing safer sex was used to predict group membership. Five predictor variables successfully classified 75% of the grouped cases. The safer sex group was younger, felt less vulnerable to AIDS, was more positive about sexual activity, felt more assured of the actual routes of transmission, and were more critical of intravenous drug users.

(Author/NB)
AIDS: Predictors of Safer Sex Practices

John R. Jacobs
Southern Connecticut State University

Hilda Speicher
University of Delaware

Heidi McCool
Ohio University

Safer Sex Predictors
Safer Sex Predictors

Abstract

Two hundred and sixty-one randomly selected college students from the evening division of a large urban campus responded to a survey concerning predictors of safer sex behaviors. Approximately 68% of the population was female, the average age was 26, and 94% of the population reported that they were heterosexual. Questions developed by the authors concerned knowledge about sources of HIV transmission, history of sexual behavior, attitudes toward homosexuality, IV drug users, casual sex, AIDS hysteria, and heterosexual invulnerability to infection. Almost the entire population knew how HIV was transmitted, but 40.4% responded incorrectly or were unsure about ways in which one cannot be infected. Nine percent of the heterosexual population practiced safer sex although 27 percent had sexual contact with a high risk group member. A stepwise discriminant analysis using variables hypothesized in the research literature to be associated with practicing safer sex was used to predict group membership. Five predictor variables successfully classified 75% of the grouped cases. The safer sex group was younger, felt less vulnerable to AIDS, was more positive about sexual activity, more assured of the actual routes of transmission, and more critical of IV drug users. Implications for models of safer sex behavior are discussed.
AIDS: Predictors of Safer Sex Practices

The number of Acquired Immune Deficiency Syndrome (AIDS) cases has continued to increase in the 1990's. As of January 1992, 209,693 people had been diagnosed with AIDS and 135,434 people, 59% of the cases, had died (AIDS Alert, April 1992). Of the reported AIDS cases 6% had been attributed to heterosexual contact with a high-risk person. Information regarding transmission, dangers, and prevention of the disease has inundated the media and most higher educational institutions. In spite of public awareness on the spread of AIDS, recent studies have found little evidence of significant modifications of sexual behavior among sexually active heterosexuals (Fisher & Misovich, 1990; Gray & Saracino, 1989; Loos & Bowd, 1989; Osborn, 1989; Siegal & Gibson, 1988; Thurman & Franklin, 1990; Tunner & Pollack, 1988). Diclementi (1987) found that only 10% of the subjects in his college population used condoms consistently. Chervin (1988) found that only 25% of the college population practiced safer sex and Siegal and Gibson (1988) found that 68% of the adult population reported that AIDS had little or no impact on their sexual behavior. Winslow, Rumbrut, and Hwang (1989) found that only 8% of their sample practiced safe sex. Gray and Saracino (1989) and Loos and Bowd (1989) found little if any use of safer sex practices. Fisher and Misovich (1990) found that college students had not increased their preventive behaviors and had actually become more likely to engage in risky
behaviors. Thurman and Franklin (1990) argued that no change occurred in safer sex practices due to standard education or media programs.

The general public's failure to practice safer sex has been attributed to a number of causes. According to Osborn (1989) the public envisions the elimination of the threat of AIDS by scientific and technological advancement.

An increasingly popular explanation for the failure to practice safer sex is the concept of invulnerability. Becker and Joseph (1988) and Reuben et al. (1988) found that adolescents and college students report general feelings of immortality and, therefore, invulnerability to AIDS despite engaging in high risk behaviors. These feelings of invulnerability might be facilitated by AIDS' association with socially "deviant" groups such as drug users, prostitutes, homosexuals, and bisexuals. Individuals who do not belong to one of these groups may feel that there is little possibility of being exposed to the virus. Also, people might feel that, by practicing safer sex, they are implying that they or their partners might have had sexual contact with a social deviant or have been or are a member themselves of a deviant group. Siegel and Gibson (1988) and Winslow et al. (1989) argued that the association of AIDS with intravenous (IV) drug users and homosexuals lures heterosexual non-IV drug users into a false sense of security which makes them less likely to practice safer sex and, in turn, more likely to
contract or spread the disease. Thurman and Franklin (1990) and Hobtoll, Gayle, Gruber, and Levine (1990) argued that heterosexuals must feel personally at risk in order to initiate changes in sexual practices.

AIDS hysteria has also been hypothesized as a factor which may influence safer sex practices. Winslow et al. (1989) argued that an irrational fear of contracting AIDS is actually related to an increase in sexual partners and unsafe sexual practices such as not using condoms. They found, however, that there was no significant correlation between AIDS hysteria, level of sexual activity, and safer sex practices. Hobtoll, et al., (1990) suggest that increasing anxiety about contracting AIDS should increase safer sex practices. Winslow et al. hypothesized that an unrealistic fear of AIDS is a function of a lack of knowledge about the ways that HIV can be transmitted. Kaplan et al. (1987), Manning, Barenberg, Gallese, and Rice (1989), and Siegel and Gibson (1988) argued that individuals need to know and believe that behavioral changes are effective for reducing one's chances of contracting AIDS. The relationship between AIDS hysteria and high risk sexual activity is underresearched.

Problems with AIDS hysteria being a predictor of risky sexual behavior may involve the assumption that individuals are AIDS hysteric because they are not aware of the routes of transmission. The vast majority of these individuals may in fact
be accurate or knowledgeable about mechanisms of HIV transmission but mistaken (or unsure) about incorrect methods of transmission. These individuals may fear contracting AIDS from sources that they are unsure of concerning HIV transmission. If their behavior is affected by AIDS hysteria, it should be in the opposite direction involving less risky sexual behavior. Secondly, it may be that AIDS hysteric individuals' distinguishing characteristic, their avoidance of high-risk group members, might be based on factors other than prevention of HIV infection, such as not wanting to be perceived as a member of a socially deviant group.

This study will assess the predictors of safer sex practices. Attitudes toward deviant groups associated with AIDS, IV drug users and homosexuals, and toward casual sex will be examined as well as beliefs about invulnerability, the scientific community, and AIDS hysteria. The predictive value of knowledge about modes of transmission will also be assessed.

Method

Subjects

Two hundred and sixty-one subjects were randomly selected from the campus grounds of a large university in New York City. The population at this college is about 45% White, 30% Black, 15% Hispanic, 5% Asian, and 5% designated as other. Although ethnicity information was not obtained in this study the sampling method was identical to previous studies obtaining this...
distribution (Jacobs, 1989; Jacobs & Bovasso, in press). Subjects ranged in age from 17 to 64 years, with a mean age of 26. Sixty-eight percent of the sample was female and 32% male.

Information was collected on sexual activity and sexual orientation. Approximately 94% of the population reported that they are heterosexual, 3% bisexual, and 3% homosexual. Approximately 76% reported current or past sexual activity and 24% reported no sexual experiences. Nearly 76% of the total population was or had been sexually active (within the last 10 years) but only 9% had employed safer sex practices. Also, among the sexually active population nearly 27% had had sexual intercourse with at least one high-risk group member.

Materials

The set of questions was developed by the authors for the current study and consists of four sections: (a) knowledge about transmission, (b) history of sexual behavior and experiences, (c) attitudes toward homosexuality, IV drug users, casual sex, and the scientific community, and assessments of AIDS hysteria and belief in heterosexual invulnerability to infection, and (d) demographic questions.

The six knowledge questions include two items which describe actual transmission routes for HIV (sexual intercourse, receiving blood) and four items which describe situations where HIV cannot be transmitted (swimming in a public pool, shaking someone's hand, donating blood, and sitting next to someone who
Safer Sex Predictors

has AIDS). The second section assesses peoples' past and current contact with members of high-risk groups such as hemophiliacs, prostitutes, male bisexuals, IV drug users, and persons who have received untested blood. Also included are questions pertaining solely to the most recent relationship, its length, monogamy, use of condoms, and knowledge of partner's history of sexual behavior.

The third section contains six scales of 7 items each (4 point Likert scale with 1 = disagree or negative attitude and 4 = agree or positive attitude) which assess the following attitudes and beliefs: (a) belief in heterosexual invulnerability to contracting AIDS, (b) attitude toward homosexuality, (c) attitude toward IV drug users, (d) attitude toward casual sex, (e) attitude toward the scientific community, and (f) AIDS hysteria. The fourth section was concerned with demographic information and asked subjects for their age, sex, and sexual orientation.

Procedure

Questionnaire packets were distributed at the entrances of each of the three buildings on campus. Every third person who entered the building was asked to fill out the questionnaire. In order to insure anonymity subjects were given an envelope so that after filling out the questionnaire they could place it in the envelope, seal it, and deposit the material in a large box with other sealed envelopes. Few subjects declined to fill out the
questionnaire and about 30% asked to be notified of the results. Only subjects who identified themselves as heterosexual were included in the analyses.

Results

Knowledge

Ninety-eight percent of the subjects responded correctly on the two questions about the actual ways that HIV can be transmitted. However, 40.4% of the population responded incorrectly or were not sure about the items which described ways in which HIV cannot be transmitted. These were donating blood, shaking hands, swimming in a public pool, and sitting next to someone with AIDS. About 19% of the subjects believed that HIV could be contracted by donating blood. Almost 22% were not sure if HIV could be contracted by donating blood, shaking hands, swimming in public pools, or sitting next to someone who has AIDS.

Factor Analysis of Attitude Scales

The 42 items designed to assess six attitudes and beliefs were submitted to a principal components factor analysis with a varimax rotation. Six factors were extracted, accounting for 66.3% of the variance. The first factor was called "AIDS hysteria" (AHIS), accounted for 27.7% of the variance, and internal consistency measured by Cronbach's alpha coefficient was .89. This factor includes items such as "I would not sit next to a person who has AIDS on the subway." The second factor to
emerge was named "attitude toward casual sex" (CASSEX). It accounted for 14.6% of the variance and was internally consistent at .79. "Having a sexual relationship based only on a physical attraction is immoral" (reversed scored) is representative of the items on this scale.

The third factor was named "attitude toward homosexuality" (HOMSEX), accounted for 12.1% of the variance, and was internally consistent at .80. A sample item from this scale is: "Homosexuality is not indicative of some type of emotional or psychological problem." The fourth factor to emerge was called "Heterosexual Invulnerability Myth" (MYTH), accounted for 8.6% of the variance, and was internally consistent at .86. This scale includes items such as "Safe sex is not necessary if I don't date homosexuals or I.V. drug users."

The fifth factor was named "attitude toward I.V. drug users" (IV), accounted for 7.4% of the variance, and was internally consistent at .66. The item "IV drug users are best described as victims rather than criminals" is representative of this factor. The sixth factor was called "attitude toward the scientific community" (SCI), accounted for 5.9% of the variance, and was internally consistent at .58. This scale includes items such as "I feel the scientific community is exaggerating the extent of the AIDS crisis."

Predictors of Safer Sex

A stepwise discriminant analysis employing the Wilks'
Lambda method was used to determine which variables might predict, for sexually active subjects, safer sex practices. Subjects were grouped according to whether or not they practiced safer sex. Those who reported sexual contact with members of high-risk groups were not included in the analysis because the authors wished to determine the predictors of safer sex practices among people who did not already consider themselves at risk for infection due to association with high-risk group members. A total of 207 subjects were included in the analysis with 193 assigned to the unsafe sex group and 14 assigned to the safe sex group. Subjects' safer sex practices served as the dependent variable. The eight independent variables used to predict safer sex practices, in order of entry, were: AIDS hysteria, attitude toward casual sex, attitude toward homosexuality, age, attitude toward the scientific community, heterosexual invulnerability myth, attitude toward IV drug use, and knowledge. See Table 1 for the within group correlation matrix.

Analysis resulted in a significant discriminant function ($\chi^2 = 19.679, \ p = .0014$). Five factors were found to be significant predictors of reported safer sex practices. Predictors of safer sex behavior are age, heterosexual invulnerability myth, attitude toward casual sex, knowledge, and
Safer Sex Predictors

attitude toward IV drug users. Table 2 presents the results of the discriminant analysis.

Insert Table 2 about here

Age is the strongest predictor of safer sex with younger people ($M = 20.71$) practicing safer sex and older people ($M = 26.23$) not. Heterosexual invulnerability myth is also a strong predictor with greater endorsers of myth ($M = 3.70$) practicing safer sex and those who endorse myth, but less so ($M = 3.29$) not practicing safer sex. Mean scores for attitude toward casual sex are 2.67 (positive) and 2.77 (negative) for the safer sex and unsafe sex groups, respectively. For knowledge, mean scores are 1.21 and 1.13 for the safer sex and unsafe sex groups, respectively, with lower scores indicating greater uncertainty about modes of transmission (range = 1 to 2). Mean scores for attitude toward IV drug users are 1.66 and 1.85 for the safer sex and unsafe sex groups, respectively, with higher scores indicating a more positive attitude (range = 1 to 4).

Employing the significant predictor variables for classification of all subjects ($n = 258$) into safer sex and unsafe sex groups successfully classified ($F (5,201) = 1.965, p = .0145$) 75.36% of the grouped cases. Classification of subjects who had reported sexual contact with a high-risk group
member was no better than chance (50%).

Discussion

Development of items to assess attitudes and beliefs concerning high-risk groups, the scientific community, belief in heterosexual invulnerability myths, and AIDS hysteria resulted in six scales, five of which were reliable (alphas ranged from .79 to .89). The attitude toward IV drug users scale was usable at .66, however, low reliability of the attitude toward the scientific community scale at .58 may have contributed to it's not being a significant predictor in the discriminant analysis. Future research should continue psychometric validation of these measures so that researchers may examine further the influence of belief in heterosexual invulnerability myths, AIDS hysteria, and attitudes toward high-risk groups and casual sex on safer sex behavior.

Results of the discriminant analysis indicated five significant predictors of safer sex behavior: age, heterosexual invulnerability myths, attitude toward casual sex, knowledge, and attitude toward IV drug users. The strongest predictors of safer sex behavior are age and belief in heterosexual invulnerability myths.

Older subjects' lack of safer sex practices may reflect a belief that AIDS is a younger, more sexually active person's disease. However, the older population is more likely to have accumulated a greater number of partners and may be more
vulnerable to the AIDS virus. Older people might be responding to their own past risky behavior, which cannot be erased, by denial of their vulnerability to infection. Also, although the average age of this group is in the mid-twenties, they are more likely to be in a more involved relationship which may contribute to their willingness to deny that they could have transmitted or received the AIDS virus from their partners. Over 90% of the subjects were in a relationship with a duration of less than 3 years which makes them vulnerable to contracting the virus, even if the current relationship is monogamous. Furthermore, sexual and romantic relationships involve high levels of arousal and idealization (Jacobs, 1989; Sugrue, 1989) which may help eclipse the possibility that they or their partner could be infected with HIV. Finally, it may be that older people experience greater costs in practicing safer sex than younger people. Younger people came of age during the AIDS crisis, and thus, have always been faced with the need to practice safer sex. Older people’s need to change behavior, however, results in greater cost.

Based on the literature, the authors expected that myth would predict unsafe sex practices. Instead, the opposite was found, belief in heterosexual invulnerability myths is predictive of safer sex practices. These subjects do believe that dissociation from high-risk group members and engaging in serially monogamous relationships can prevent HIV infection. The negative correlation of this factor (see Table 1) with both
attitude toward homosexuality and attitude toward intravenous drug users is consistent with the need to dissociate from high-risk group members and behaviors as assessed by the heterosexual invulnerability myths scale. However, dissociation is not the sole defense employed against vulnerability to HIV infection. The myth scale is also negatively correlated with knowledge, indicating that this group is highly uncertain about all of the modes in which HIV is not transmitted. Furthermore, these subjects have an irrational fear about unsubstantiated ways of contracting AIDS as suggested by the positive correlation of the myth scale with AIDS hysteria. The correlation of these factors suggests that this population not only needs to dissociate from high-risk group members, but also needs to avoid contact with these people in non-intimate situations (e.g., on the subway or at the work place). In addition, the participants in this study knew nothing or next to nothing about their partners' sexual history. Fifty two percent knew little about their partners' sexual history and 23% never asked. This sexually active population reported not associating with those at risk for AIDS, but actually knew little about their partners' sexual behavior which may make them vulnerable to contracting the AIDS virus. These people may endorse heterosexual invulnerability myths as a defense against their fear of being vulnerable to infection.

Also this study found that knowledge of routes that AIDS may or may not be transmitted through, attitudes toward
casual sex, and attitudes toward IV drug users were significant, albeit minor, predictors of safer sex behavior. Although, in general, subjects were correct concerning actual modes of transmission, they were very uncertain about the items describing ways in which AIDS cannot be transmitted. Greater certainty about routes which do and do not transmit HIV was predictive of safer sex behaviors. This finding is consistent with arguments made (e.g., Winslow, et al., 1989) that knowledge of how AIDS is transmitted should lead to safer sex practices, however, it is important to note that this sample, as others (e.g., Fisher & Misovich, 1990; Katzman, Mulholland & Sutherland, 1988; Loos & Bowd, 1989; Manning, et al., 1989) is highly knowledgeable about actual modes of transmission and yet few practice safer sex. Uncertainty of how AIDS is not transmitted may be the better predictor of safer sex behaviors, although the relationship is a weak one.

People with positive attitudes toward casual sex, implying that they are less inhibited by sexual expression, take precautions against infection such as using condoms and may be more comfortable about talking to their partners about safer sex and sexual matters in general. The last and least important predictor of safer sex practices is a more extreme negative attitude toward IV drug users, suggesting that some heterosexuals who practice safer sex may have a greater need to avoid and dissociate themselves from other heterosexuals who could possibly
infect them.

In this study AIDS hysteria is not significantly predictive of safer sex practices in accord with the Winslow et al.'s (1989) failure to support their hypotheses that AIDS hysteria would increase risky-behavior. Future research might be concerned with determining possible moderating factors which would influence the relationship between AIDS hysteria and safer sex practices.

Some of our findings are consistent with previous research in this area, such as a low percentage of people practicing safer sex, a weak relationship between knowledge and safer sex practices, and an insignificant relationship between AIDS hysteria and safer sex behaviors. The relationship between heterosexual invulnerability myth and safer sex practices was unexpected, but upon closer inspection of this factor's relationship to other attitude measures and knowledge of transmission and partners' sexual history, the result is no longer confounding. However, there are some weaknesses in this study. The low R square (9%) indicates that not much of the variance in safer sex behavior was accounted for by the proposed model, although the model was highly significant and was a strong discriminator between groups in the classification analysis. Perhaps obtaining a larger sample of people who engage in safer sex behaviors is needed to more accurately test the model. What these findings suggest is that factors influencing the decision
to employ safer sex practices are multiply determined and are not encouraged by the simple messages typically broadcasted to the public. Until recently, media and educational programs have concentrated on high-risk populations allowing the non-IV drug users heterosexual population to dissociate from the potential of becoming infected. After announcement of the infection of a well-known sports figure testing for HIV infection increased tenfold nationwide. Media and educational campaigns may prove more effective by emphasizing vulnerability of heterosexuals who don't use drugs. Researchers might contribute by informing the public that so few people actually practice safer sex and yet, a substantial percentage of the heterosexual population has had sexual contact with at least one high-risk group member. A heightened sense of invulnerability, however, may intensify negative perceptions of and dissociation from high-risk group members. Education programs and the media need to address this phenomena in order to increase effectiveness of prevention programs as well as for obvious ethical reasons.

The act of sexual intercourse is very intimate, whether one's partner is a long term lover or an acquaintance. It is not difficult to believe that people will be hesitant to ask about their partner's sexual history or insist upon employing safer sex practices. Such behavior may terminate the interaction. Much more research needs to be done to understand the psychosocial determinants of this behavior. Clearly, attitudes toward high-
risk group members, own vulnerability, and knowledge will contribute to the decision, but a number of other factors must be involved and it is our responsibility as social scientists to seek them out. Research should be conducted to further validate the measures developed for this study, to expand the proposed model, and to test the model in a number of different populations. Fear of becoming infected not only causes dissociation from high-risk group members, it may change risky sexual behavior. This study supports Hobtoll, et al’s. (1990) argument for increasing anxiety concerning potential infection in the heterosexual population.
References


Siegel, K., & Gibson, W.C. (1988). Barriers to the modification
of sexual behavior among heterosexuals at risk for acquired immunodeficiency syndrome. New York State Journal of Medicine, 88, 66-70.


Table 1: Pooled within-group correlations among predictors.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>CASSEX</th>
<th>HOMSEX</th>
<th>AGE</th>
<th>SCI</th>
<th>MYTH</th>
<th>IV</th>
<th>KNOWLEDGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHIS</td>
<td>-.20</td>
<td>-.54</td>
<td>.14</td>
<td>.09</td>
<td>.35</td>
<td>-.20</td>
<td>-.28</td>
</tr>
<tr>
<td>CASSEX</td>
<td>.45</td>
<td>-.18</td>
<td>-.00</td>
<td>-.07</td>
<td>.18</td>
<td>.17</td>
<td></td>
</tr>
<tr>
<td>HOMSEX</td>
<td>-.25</td>
<td>.00</td>
<td>-.25</td>
<td>.36</td>
<td>.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>-.13</td>
<td>.08</td>
<td>-.19</td>
<td>-.15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCI</td>
<td>.04</td>
<td>.01</td>
<td>-.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MYTH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.17</td>
<td>-.24</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.18</td>
</tr>
</tbody>
</table>
## Table 2: Results of discriminant function analysis on safer sex predictors.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Correlation of Predictor Variables with Discriminant Function</th>
<th>Univariate F(1,205)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td>-0.56</td>
<td>6.55</td>
</tr>
<tr>
<td>MYTH</td>
<td>0.53</td>
<td>5.87</td>
</tr>
<tr>
<td>CASSEX</td>
<td>0.36</td>
<td>2.75</td>
</tr>
<tr>
<td>KNOWLEDGE</td>
<td>0.35</td>
<td>2.59</td>
</tr>
<tr>
<td>IV</td>
<td>-0.24</td>
<td>1.22</td>
</tr>
<tr>
<td>HOMSEX</td>
<td>0.09</td>
<td>0.41</td>
</tr>
<tr>
<td>SCI</td>
<td>0.08</td>
<td>0.19</td>
</tr>
<tr>
<td>AHIS</td>
<td>0.04</td>
<td>0.09</td>
</tr>
<tr>
<td>Canonical R</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>0.10</td>
<td></td>
</tr>
</tbody>
</table>