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SEXUAL BEHAVIOR AND AIDS-RELATED KNOWLEDGE AMONG COMMUNITY COLLEGE STUDENTS IN ORANGE COUNTY, CALIFORNIA

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ABSTRACT: Whereas college students are not identified as a high-risk group for acquiring the HIV infection, they exhibit high-risk behaviors consistent with their age group, including multiple sexual partners and high rates of unprotected intercourse. This study was conducted to determine levels of HIV-related sexual behavior, along with knowledge and attitudes among students attending community colleges in a relatively affluent multiethnic community. This study used a random sample survey ($N = 319$) of students attending selected classes at four community colleges in Orange County, California, to assess HIV/AIDS knowledge, attitudes, and patterns of past and present sexual behavior. The level of student knowledge concerning HIV disease was found to be relatively high, and pronounced differences in knowledge and sexual permissiveness were identified as a function of ethnicity and religion, with Asians showing lower knowledge and lower concern about HIV, and religion/religiosity related to these variables and also to levels of sexual permissiveness. Respondents' comfort in asking a partner about his/her sexual history was positively associated with their level of self-esteem, and negatively related to peer pressure in this population. As in previous studies of college populations, HIV knowledge per se does not confer a protective effect against high-risk behavior. However, knowledge was found to be an enabling factor with regard to students' comfort levels in asking about their partner's sexual histories, and in requesting that partners take an AIDS test.

INTRODUCTION

The first studies of Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) education and attitudes ap-

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peared approximately ten years ago.¹ Subsequently, in a number of regions AIDS has become the leading cause of death for Americans 25 to 44 years of age,² and it has been estimated that fully half of the 14 million people (worldwide) with HIV were infected between the ages of 15 and 25.³ On college campuses, the presence of HIV infection has been documented, and although rates are lower than those for recognized high-risk groups,^{4,5} surveys of college students have revealed high levels of unprotected sexual intercourse with multiple partners,^{6,7} and studies indicate that these risk-related behaviors occur in spite of high levels of HIV/AIDS-related knowledge.⁸⁻¹⁰ Because we believe the issues of HIV-related information, attitudes, and practices of high school students and freshman and sophomore level college students to be similar, we chose to review literatures pertinent to both populations.

The majority of existing research within high school and college populations has focused on students' AIDS-related knowledge and, to a lesser extent, safe sex practices.¹¹ Study findings are consistent in demonstrating that the generally accurate knowledge exhibited by both high school¹² and college students does not result in safe sex practices by those students,¹³⁻¹⁸ with safe sex measured by condom use, number of sexual partners, and (to a lesser extent) other sexual parameters, e.g., anonymous sex, anal intercourse. Moreover, an interaction has been found among high-risk practices, as those students with the greatest number of sexual partners were found to be least likely to use condoms.¹⁶ Additional factors, such as self-efficacy and communication, have been studied for their relationship to actual preventive practices. One study found self-efficacy significantly related to AIDS-preventive behavioral intentions and knowledge about AIDS, although not directly related to preventive practices,¹⁹ while communication about sex and safer sex practice predicted actual safer sex practices.²⁰ Other studies have shown that proximity to a high-density AIDS epicenter (San Francisco) has no impact on HIV/AIDS knowledge and attitudes,²¹ and that religious affiliation does not decrease risky sexual behavior, at least among religious students who are sexually active.²²

The present study was designed to examine HIV/AIDS-related characteristics—sexual behaviors including condom use, and HIV 1 knowledge and attitudes—among students attending community colleges in Orange County, a relatively affluent, mostly suburban county in Southern California. The study sought to (1) determine characteristics of sexual behavior, condom use and levels of HIV testing for this population, (2) identify the source and perceived effectiveness of HIV/AIDS information received by these students, and (3) measure HIV-related knowledge, attitudes and be-

havior as a function of student characteristics, sources of information, and self-ratings of AIDS knowledge.

METHODS

Population-based studies investigating attitudes and behaviors related to HIV disease among adults²³ and adolescents²⁴ have necessarily relied upon survey research methods, recognizing that the resulting self-reported data may underestimate the occurrence of relevant behaviors and produce somewhat optimistic estimates of certain attitudinal variables. Nevertheless, this methodology has been acknowledged as a crucial means of tracking public response to the AIDS epidemic, and assessing relationships between respondent characteristics, attitudes, behaviors, and specific knowledge regarding AIDS and HIV disease.²⁵

The target population for the present survey consists of students attending any of four community colleges located in Orange County, California during the academic year 1994–95. This county is the third most populous in the state and the second highest in average income. One in three households in the county is Hispanic and the county has concentrations of Vietnamese and other Asian populations (10%) whereas African-Americans are underrepresented (1.6%).²⁶ College classes were selected for inclusion based on course content related to the substance of the study. This included introductory science and social science courses,—biology, chemistry, psychology, and sociology—along with community college-level health and health professions courses.

Questionnaires were distributed over a six month period within classes with the cooperation of course instructors, who generally permitted their completion either before or after class sessions. As a result, the study achieved a 74.3% response rate. Respondents over the age of 26 have been eliminated from the analysis in order to focus study findings on the vulnerable young adult population discussed above; the resulting study population consists of 319 respondents 18 to 26 years of age.

Study questionnaires included 124 items covering a broad range of sexual behaviors, as well as condom use, attitudes towards AIDS, sources of HIV-related information, and demographic characteristics of the respondents. Subsets of questions were used to construct scales reflecting HIV knowledge, concern about HIV risk, sexual permissiveness, peer pressure, and self-esteem. The internal consistency (alpha coefficient) for these scales ranges from .62 to .76; individual questionnaire items for each of the scales are shown in the Appendix. Many of the items in the knowledge

scale were replicated from AIDS questions utilized in the National Health Interview Survey.²⁷

A dichotomous measure of high-risk sexual behavior (three or more sexual contacts, coupled with sporadic or non-use of condoms) was derived from previous research that utilized estimates of risk of heterosexually transmitted infection associated with specific combinations of circumstances,²⁸ which were then used to assign risk scores to individuals.²⁹ In this analysis, the dichotomous measure is shown as percentage of respondents who fall into the "high-risk" category, although this designation cannot be compared to other populations whose potential exposure to HIV is substantially higher (e.g., a survey of sexual exposure among Los Angeles "street" youth conducted during the same time period³⁰). Statistical methods employed in the analysis include the chi-square test, analysis of variance, and (for respondent evaluations of their sources of HIV-related information) repeated-measures analysis of variance. Because of the use of multiple comparisons among tabulated variables,³¹ only those with P values < .01 are considered statistically significant, and only those with P values < .001 are interpreted in the text.

RESULTS

The mean age of respondents included in this study was 20.8 years. Males represented 45.1% of the sample. Respondents generally came from middle-class families (59.2%). Perhaps the most notable demographic aspect of the sample was the presence of significant numbers of Vietnamese (17.5%) and other Asians (17.1%), in addition to non-Hispanic whites (44.1%), Hispanic (14.3%), and other (7%), including African-American. An offshoot of this ethnic representation was the relatively high percentage of Buddhists (10.7%) and Catholics (32.9%) in the sample, while Protestants represented 17.6%. In addition to religious affiliation, the study questionnaire asked respondents to rate themselves with regard to religiosity. The largest number of respondents rated themselves as moderately religious (42.5%), with 34.6% reporting themselves to be only slightly or not at all religious.

Tables 1–3 describe sexual histories, condom use and HIV testing among this group, as well as attitudes related to sexual openness and use of appropriate precautions. Findings show that just half of these students were sexually active, and most of those had a (single) regular partner. However, multiple previous partners were the norm among those who had ever had intercourse (Table 1).

TABLE 1

Sexual Experience	
<i>Percentage who have ever had . . .</i>	%
Oral sex	71.3
Vaginal sex	69.8
Anal sex	15.4
Are currently sexually active	49.8
<i>Age When First Became Sexually Active</i>	
16 or younger	47.7
17 or older	52.3
<i>Percentage of Respondents Who've Had Sex With . . . (number of partners)</i>	%
None	20.7
One	19.7
Two	12.8
Three	9.7
Four	7.6
Five or More	29.7
<i>Description of Current Sexual Relationship</i>	%
I have an occasional partner	9.4
I have one regular partner	42.5
I have one primary partner and occasional other partners	3.3
I have multiple partners, none of which is my primary partner	1.0
I am not currently sexually active	43.8

Condom use (some or all of the time) was reported by nearly three-quarters of respondents (Table 2) with likelihood of use varying substantially based on contextual factors—type of partner, and previous experience with that person. Almost 43% of the sample either agreed or strongly agreed with the statement that “using condoms makes sex less enjoyable,” and approximately two-thirds said they were “not likely” to use a condom with a steady boyfriend or girlfriend. The vast majority of the sample agreed that both males and females should take equal responsibility for supplying condoms; while 78% stated that drug or alcohol use had never been involved in instances of lack of condom use.

Questions regarding comfort in discussion with partners regarding sexual histories and AIDS testing revealed highly significant differences

TABLE 2

Condom Use				
<i>How often do you use a condom when you are having sex?</i>				
		%		
Never		26.0		
Sometimes		50.2		
All of the time		23.8		
<i>Likelihood of using a condom during sex</i>	<i>Not Likely</i>	<i>Somewhat Likely</i>	<i>Very Likely</i>	<i>Total</i>
	%	%	%	%
With a steady boy/girlfriend	36.0	30.1	33.9	100.0
Your first time with someone you know well	11.3	25.9	62.8	100.0
Every time you have sex with someone you know well	17.5	39.7	42.8	100.0
Your first time with someone you do not know well	3.4	5.9	90.7	100.0
Every time you have sex with someone you do not know well	4.8	7.3	87.9	100.0
<i>Condoms make sex less enjoyable</i>		%		
Strongly disagree		10.3		
Disagree		15.5		
Neither agree nor disagree		31.4		
Agree		30.6		
Strongly agree		12.2		

based on ethnicity (not tabled). Among the variables listed in Table 3, Vietnamese (and to a somewhat lesser extent, other Asians) were found to be less comfortable asking a partner about his or her sexual history or requesting that he or she take an AIDS test ($P < .0001$) and were more likely to cite fear of others finding out, fear of blood draws, and not knowing where to have it done as reasons for not having an AIDS test (P values: $.01 - < .001$). (Buddhist religious affiliation showed similar significant associations).

Thirty percent of the sample had previously had an HIV test, while 58% planned on having a test. The most frequently endorsed reasons for not having a test were not feeling it was necessary, fear, and concern over

TABLE 3

Sexual History, AIDS Testing

<i>How comfortable are you in asking your current sexual partner about his/her sexual history (e.g., number of partners, history of sexually transmitted diseases, previous possible exposure to HIV)?</i>		%
Not very comfortable		11.2
Somewhat comfortable		19.6
Very comfortable		69.2
<i>How comfortable do you feel about asking your current sexual partner to take an AIDS test?</i>		
Not very comfortable		16.2
Somewhat comfortable		28.1
Very comfortable		55.8
<i>Have you ever had an AIDS test, not including blood donations?</i>		
Yes		29.9
No		70.1
<i>Most common reasons for not having an AIDS test</i>		<i>Rank order</i>
I do not think I need one		1
I am scared to have one done		2
If I test positive, I am afraid someone will find out		3
I do not want to know if I am HIV positive		4
I do not know where to have a test done		5
I am afraid to have my blood drawn		6
I am afraid of someone finding out that I've had one		7
<i>Has your current partner had an AIDS test?</i>		%
Yes		25.2
No		49.2
Don't know		25.6

someone else finding out about positive results. Only 25% of partners of those subjects currently sexually active had had an HIV test. Neither actually having had an AIDS test, having one's partner tested nor thinking about the possibility of contracting HIV when contemplating sex differed significantly by ethnicity or by any other demographic characteristics. The vast majority (85.8%) of respondents stated that use of drugs or alcohol had never been a factor in having sexual encounters they otherwise would

not have had. Additional data (not tabled) show that only 5% of the sample admitted to having had same sex experiences, and 97% denied having ever used IV drugs or steroids.

Results of respondents' rankings of potential sources of information on HIV/AIDS indicate that print media, followed by TV, radio, and classes, were the most frequently cited sources of information about HIV and AIDS. Family members and the family doctor were the least often cited sources of information. The findings also show that "special programs and classes" scored uniformly high in both effectiveness and trust ($x=2.7$, range 1-3), and in addition to print and other media were a leading source of information. By contrast, family sources were an infrequent source of information and correspondingly were viewed as somewhat less credible ($x=2.3$). Many of these students (57.9%) had had a class dealing with AIDS information, but only a minority of them (24.6%) felt that they knew "a lot" about AIDS.

Table 4 shows the relation of knowledge, attitudinal and behavioral indices derived from questionnaire variables, and Table 5 compares these

TABLE 4

Relationship of Cognitive, Non-Cognitive, and Behavioral Indices

<i>Index Parameters</i>	<i>Mean (\bar{x})</i>		<i>Range of Scores</i>		
HIV-Related Knowledge	10.5		2-14		
Concern about HIV Risk	20.7		6-25		
Sexual Permissiveness	20.5		8-39		
Peer Pressure	8.2		4-20		
Self-Esteem	13.9		5-18		
High-Risk Sexual Behavior	34.8		Dichotomous (0/100)		
<i>Correlation</i>					
<i>Coefficients</i>	<i>Knowledge</i>	<i>Concern</i>	<i>Permissiveness</i>	<i>Pressure</i>	<i>Esteem</i>
Concern	.38**				
Permissiveness	.06	-.06			
Pressure	-.14*	-.29**	.15*		
Esteem	.11	.07	.09	-.20**	
High-Risk	.20**	.06	.30**	.02	.21**

* $p < .05$

** $p < .01$

TABLE 5

Study Indices by Respondent Characteristics, Context of HIV/AIDS Information

	<i>HIV-Related Knowledge (x)</i>	<i>Concern About HIV Risk (x)</i>	<i>Sexual Permissiveness (x)</i>	<i>Peer Pressure (x)</i>	<i>Self-Esteem (x)</i>	<i>High-Risk Sexual Behavior %</i>
<i>Ethnicity</i>						
Non-Hispanic White	11.4***	21.3***	21.2	7.7**	14.2*	43.9*
Hispanic	11.0	21.2	20.6	8.0	13.7	28.9
Vietnamese	8.9	19.0	18.9	9.7	13.2	16.4
Other Asian	9.4	20.2	20.1	8.4	13.9	35.2
Other, Including Black	10.6	21.3	22.2	8.0	14.0	40.1
<i>Age When First Became Sexually Active</i>						
16 or Younger	10.8	20.5	21.8	8.7*	14.2	63.4***
17 or Older	10.9	21.1	21.2	7.8	14.2	32.5
<i>I consider myself to be . . .</i>						
Not Religious	10.9	20.7	25.3***	8.4**	13.8	47.6**
2	10.7	20.8	22.0	8.2	14.2	36.2
3	10.4	20.8	19.7	8.2	13.8	35.6
4	10.2	20.3	18.4	9.0	13.8	27.8
Very religious	10.1	20.3	14.9	5.6	14.1	5.3
<i>Classes Dealing With AIDS Information</i>						
Yes	11.0***	21.0*	20.3	8.0	14.0	42.3
No	9.8	20.3	20.9	8.5	13.8	36.0

TABLE 5 (Continued)

	<i>HIV-Related Knowledge (x)</i>	<i>Concern About HIV Risk (x)</i>	<i>Sexual Permissiveness (x)</i>	<i>Peer Pressure (x)</i>	<i>Self-Esteem (x)</i>	<i>High-Risk Sexual Behavior %</i>
<i>How much do you know about AIDS?</i>						
A Lot	11.5***	21.4***	21.4	8.1	14.0*	42.3
Some	10.6	20.9	20.1	8.1	14.1	34.3
A Little	8.9	19.1	20.5	8.5	13.3	25.9
<i>Ever had an AIDS test?</i>						
Yes	11.1	21.2	22.0**	8.0	14.3	64.0**
No	10.4	20.5	20.1	8.3	13.7	24.9
<i>Comfort asking a partner about sexual history</i>						
Not very comfortable	9.0***	19.7**	22.1	9.7***	12.6***	32.3*
Somewhat comfortable	9.9	19.8	21.3	9.7	14.0	27.8
Very comfortable	11.1	21.1	20.7	7.7	14.3	43.5
<i>Comfort asking partner to take AIDS test?</i>						
Not very comfortable	9.3***	19.6**	22.2	10.1***	13.1**	31.1*
Somewhat comfortable	10.6	20.0	20.6	8.5	14.0	32.1
Very comfortable	11.0	21.3	20.8	7.6	14.3	45.1

*p<.05
 **p<.01
 ***p<.001

indices across demographic and information categories. High-risk behavior (i.e., more than three sexual partners and sporadic condom use) was correlated with greater knowledge about HIV and AIDS, more permissive sexual attitudes, and greater self-esteem (Table 4). It was also related to younger age of first sexual encounter, having had an HIV test, low religiosity, and ethnicity other than Vietnamese (Table 5), as well as to older age and male gender (not tabled). Multivariate analyses (not tabled) that examined high-risk sexual behavior controlling simultaneously for HIV knowledge, concern, permissiveness, peer pressure, and self-esteem, revealed that only the increase with age at first sex remained significant with these controls in place.

Scores on the Knowledge scale ranged from 2 to 14 (Table 4), based on one point for a correct answer, zero for incorrect, to items such as "Can an infected person have an HIV test that is negative?" Overall, knowledge of HIV and AIDS in the sample was fairly high, with greater than half of the scale items receiving correct answers from 88% or more of respondents. Findings show that HIV Knowledge was related to concern about the disease, but also as noted to high-risk sexual behavior (Table 4). HIV Knowledge was also significantly higher in respondents who were comfortable asking partners about their sexual histories and about having an AIDS test, as well as in respondents who had exposure to classroom instruction about AIDS/HIV and who felt they knew a lot about the disease (Table 5). Lower HIV Knowledge was related to Vietnamese and other Asian ethnicity, and to Buddhist religious affiliation.

Other attitudinal and behavioral indices incorporated in Table 5 show a significant relationship between high peer pressure and discomfort communicating with a partner about HIV-related issues, as well as positive relationship between high self esteem and increased communication comfort. The data further show that very religious respondents were characterized by significantly less permissive sexual attitudes, less susceptibility to peer pressure, and less high risk sexual behavior compared to their religious counterparts. Finally, the data demonstrate additional unique attributes of Vietnamese students, who exhibited lower levels of concern about HIV, while reporting themselves to be most susceptible to peer pressure.

DISCUSSION

In this study, several suggestive issues are highlighted. The first has to do with the picture of the high-risk individual as defined in this study. As expected, this hypothetical person is a non-Asian young male who be-

came sexually active at a younger age than his non-high risk counterparts, has more permissive attitudes toward sexuality, and is not religious. Interestingly, he also has greater knowledge about HIV disease, is more likely to have been tested for HIV, and is more self-confident. He is marginally more comfortable talking to sexual partners about both past sexual history and AIDS testing. While the strength of these relationships is called into question by the non-significant (with the exception of early age onset of sexual behavior) findings of the regression analysis, they point to the importance of examining "positive" (i.e., self-esteem, knowledge) as well as "negative" (i.e., early-age onset of sexual behavior) factors in identifying predictors of high risk behavior in this age group.

The study also points to both at risk and protective factors characteristic of young adult immigrant groups, in this case, primarily Vietnamese. Demographic data indicated that the vast majority of Vietnamese students in our sample had been born in Vietnam, and had resided in this country between 5–10 years. This population had the lowest incidence of high-risk behavior, and appeared to be buffered by several factors, including religious affiliation, religiosity, and possibly through their greater sensitivity to peer pressure. However, their poor knowledge of HIV disease, lack of concern about AIDS, reluctance to be tested for HIV and to talk to partners about testing or sexual histories are all cause for concern, especially in the face of inevitable acculturation pressures to conform more closely to majority culture behavioral and attitudinal norms regarding sexual practices. These findings partially replicate those of a 1997 study³² which found that although white high school students were 2.3 more likely to communicate about AIDS/HIV, and 2.7 times more likely to be sexually experienced, Asian Pacific Islander students had behaviors at as high a risk as white students once they became sexually active.

In this study, it appeared that pedagogical efforts to educate young adults about HIV and AIDS were reasonably successful. Subjects who were concerned about the disease and who had taken an AIDS education class had more knowledge than those who did not. Similarly, subjects who thought they knew more about AIDS in fact did so.

It is instructive to compare certain of our findings with those of a comprehensive study of relatively affluent suburban high school seniors conducted on the other side of the country in Long Island in 1996.³³ While 70% of that sample was not yet sexually active, in our study this number had fallen to 50%, a shift that might be explainable by regional differences in sexual activity, by a significant increase in sexual activity associated with college attendance, or by other factors such as social class (studies of poor, urban high school students report much high levels of sexual activity, com-

parable to our community college sample³⁴). Considerably fewer of our subjects used condoms consistently (51%, 1996 vs. 24%, 1998), a disturbing finding suggesting either that young adults are less careful regarding AIDS transmission than they were a few years ago; or that college students are less careful than high school students. Some support for this latter interpretation comes from a study by Nguyet in Quebec, Canada, which found that condom use peaks at age 14, with levels of usage declining thereafter.³⁵ Interestingly, similar percentages of respondents in the two studies reported an influence of alcohol consumption on sexual behavior.

Knowledge regarding diagnosis and transmission of HIV disease was reasonably high in both samples, as has been found in previous studies of college student populations.¹⁰ However, in this study, such knowledge did not confer a protective effect against risk of heterosexual HIV transmission, at least as the risk of such transmission was operationalized here. Similar to the 1996 study, in which greater knowledge about AIDS was associated with increased likelihood of becoming sexually active, in this study, greater knowledge was associated with engaging in more high risk behaviors. Whereas the earlier study showed a positive relationship between increased knowledge and having a nonjudgmental attitude about HIV disease, our study reported a positive relationship between knowledge and both concern about AIDS/HIV and sexual permissiveness.

Although the relatively high levels (and truncated distribution) of knowledge in this student population, coupled with the relative absence of high-risk sub-populations in this sample (only eight students, for example, admitted to intravenous drug use) limited our ability to detect an association between knowledge and behavior, the answer to the negative findings reported previously¹³⁻¹⁸ regarding an association between increased knowledge and safer sex practices (and the positive association to high-risk behavior detected in this study) may lie in the perception of risk on the part of individuals outside of traditional high-HIV-risk populations. Groups such as the population studied here may find it difficult to translate factual knowledge into a realistic evaluation of the likelihood of occurrence of a low-probability event.³⁶ In fact, the moderate positive correlation between knowledge and high-risk behavior suggests knowledge by itself is unlikely to act as a deterrent.

Midway through the second decade of the AIDS epidemic, it is precisely the medium-risk young adults represented in this study who are being targeted for educational interventions; the observed incongruity between knowledge, concern and behavior within college populations³⁷ highlights a particular need to tailor the message to a young, healthy group, characterized by optimism, for whom heavy risks in general (not just HIV)

may be perceived as distant factors profoundly remote from their personal lives.³⁸ While it is not possible to dispute the value of young adults well-informed about their own health (and threats to their health), more strategic preventive approaches might emerge through further investigation of such factors as sexually permissive attitudes, self-esteem (as a *contributor* to high-risk behaviors!), developmental and gender issues, the role of religious and spiritual values and family structure, and the causes of early sexual behavior. Such multivariate models may be more productive in understanding the roots of risky behavior in this medium-risk population.

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