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Knowledge and Attitudes About AIDS: A Comparison of Public High School Students, Incarcerated Delinquents, and Emotionally Disturbed Adolescents

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This study compared AIDS knowledge and attitudes in public high school students (N = 167), incarcerated delinquents (N = 166), and emotionally disturbed (SED) adolescents (N = 151). The response measure was a 50-item Acquired Immunodeficiency Syndrome (AIDS) questionnaire that was previously used by Bell et al., *in their 1991 study of learning disabled adolescents. Although AIDS knowledge was moderately high in all three groups, widespread misunderstandings about disease transmission and awareness of high-risk groups and practices were noted. Knowledge scores were significantly higher in the public school sample than in the SED adolescents; moreover, they tended to be slightly higher ($p < .10$) than the delinquent group as well. Teenagers with the severest emotional problems were by far the least informed. Age and race were also predictive of AIDS knowledge. Other results showed that de-*

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linquents were more permissive in their attitudes about sex, more inclined to disdain safe sex practices, and more likely to feel threatened by high-risk groups as well as powerless to protect themselves against AIDS. Generally speaking, the findings extend the work of other investigators on the needs for AIDS education in adolescents. The need is especially urgent in delinquent and emotionally disturbed youth who may require a more comprehensive intervention because of their greater knowledge deficits, propensity for high-risk practices, and tendency to deny or underestimate their own vulnerability.

INTRODUCTION

Adolescents have been singled out as being vulnerable to Acquired Immunodeficiency Syndrome (AIDS) because of their penchant for risk-taking behavior and feelings of immortality (Youngstrom, 1991). While AIDS is relatively uncommon among adolescents, many adults now infected with human immunodeficiency virus (HIV) probably contracted the illness during their teenage years. Young gay men, juvenile delinquents, runaways, minorities, and homeless adolescents have been singled out as being most at risk (DiClemente *et al.,* 1987, 1988, 1991; Rotheram-Borus and Koopman, 1991).

Efforts to educate adolescents about AIDS have increased as the epidemic has spread. Magic Johnson's announcement that he was HIV positive was a catalyst in this regard. In spite of stepped-up health education, relatively little is known about what to teach (e.g., knowledge about the illness vs. skills to resist negative peer pressure, assess level of risk, and change unsafe practices) or which groups to target (e.g., all teenagers or those most at risk). This is because researchers often use different dependent measures and focus on only one segment of the adolescent population without the use of appropriate comparison groups. Thus, it is unclear if results from one sample are generalizable to another. Studies that have been done in this area reveal a good deal of variability in terms of what adolescents know about AIDS, their level of risk, and their inclination to change unsafe practices (see DiClemente *et al.*, 1987; Bell *et al.*, 1991; DiClemente *et al.,* 1991).

In the present study, we used a questionnaire that was developed by Bell *et al.* (1991) to compare AIDS knowledge and attitudes in three groups of adolescents: incarcerated delinquents, a sample of public high school students, and adolescents with severe emotional difficulties (SED). To our knowledge, this is the first time a direct comparison of these groups has been made. The purpose of the study was to compare the groups on two dimensions: (1) general knowledge about AIDS, and (2) attitudes that seemed to indicate if the group members would act responsibly to protect

themselves against AIDS. The role of demographic variables (age, gender, race, socioeconomic status) is also described. Although the study is conceptually similar to the work of DiClemente *et al.* (1991) and Bell *et al.* (1991) who reported on AIDS knowledge in incarcerated youth and learning disabled students, respectively, the inclusion of a comparison group of SED adolescents makes this study unique.

METHOD

Subjects

Data were collected from 484 adolescents in two metropolitan areas: Stockton, California (78%), an ethnically diverse city of about 200,000 people located in California's central valley, and Chicago, Illinois (22%). One hundred sixty-seven of the subjects (35%) were from a public high school in Stockton; 166 (34%) were confined in the San Joaquin County Juvenile Hall, which services the Stockton area; the remaining 151 (31%) were either from SED classrooms in the Chicago public school system (N = 110) or two residential treatment programs in Stockton (N = 41). For the most part, subjects in the residential facilities were adjudicated by the Juvenile Court (usually because of disruptive behavior problems) or referred by child protective services because they were perceived as needing psychiatric services. In one of the facilities (N = 11), most of the residents had a history of major mental problems (e.g., bipolar disorder, schizophrenia) and had previously undergone one or more psychiatric hospitalizations.

The public school sample consisted of a cross section of 10th graders who were enrolled in English classes at one of Stockton's four public high schools. The juvenile hall sample consisted of *all* of the residents (both males and females) who were incarcerated at the time the data were collected (Fall–Winter, 1991–1992). The SED sample from Chicago consisted of a nonrandom sample of 5th–12th graders. All of the group home residents had an SED classification and were attending an on-grounds school. The demographic differences between the groups are shown in Table I. The public school sample were more nearly half male and female, whereas the other two samples were predominantly male (55% male vs. 83% male, $p \leq .0001$). The three samples did not have the same racial makeup either ($p \leq .0001$). The California public school population had over 20% Asian students and the other institutions had very few Asian students but had higher numbers of African American students. The delinquent sample had three times as many Hispanics as the other institutions. The NORC index of socioeconomic standing (Reiss, 1961) was not available on substantial numbers of students

Table I. Demographic Composition of the Groups

	Group		
	Public school	SED	Delinquents
Gender			
Female	45.2%	19.7%	14.2%
Male	54.8%	80.3%	85.8%
N	166	147	162
Chi-square = 45.5, *df* = 2, $p \leq .0001$			
Race			
Caucasian	49.7%	46.2%	28.7%
Asian	22.7%	0.0%	5.7%
Black	8.0%	29.5%	19.1%
Hispanic	10.4%	12.1%	36.3%
Other	9.2%	12.1%	10.2%
N	163	132	157
Chi-square = 103, *df* = 8, $p \leq .0001$			
SES category			
High	44.2%	15.0%	6.9%
Middle	40.6%	20.0%	23.3%
Low	15.2%	65.0%	69.8%
N	138	40	159
Chi-square = 105, *df* = 4, $p \leq .0001$			
Age			
N	166	149	165
Mean	15.4	14.2	15.4
SD	1.4	1.4	1.4
Range	13-18	10-20	11-18
$F(2,477) = 35.3$, $p \leq .0001$, delinquent < others by Tukey's Honestly Significant Difference (HSD)			
Grade			
N	168	135	155
Mean	10.1	8.7	9.8
SD	1.3	1.3	1.3
Range	9-12	5-12	5-12
$F(2,455) = 50.5$, $p \leq .0001$, delinquent < others by Tukey's HSD			

in the delinquent and SED samples, but there was an indication the public school students had substantially fewer low SES families ($p \leq .0001$). The

SED subjects were a year younger than the other subjects (14 years vs. 15 years, $p \leq .0001$) and one year behind in grade level (9th grade vs. 10th grade, $p \leq .0001$). As a result of these demographic differences between the groups, differences between the groups in AIDS knowledge and high-risk practices may also be associated with demographic differences.

Permission from school and agency officials was obtained before the questionnaire was administered. All subjects were informed that their answers would be confidential and they were encouraged to be as honest in their reporting as they could. They were also told that the purpose of the questionnaire was to learn what young people think and feel about AIDS. If any of the subjects needed help reading the questionnaire, it was made available to them by reading the item(s) aloud. In all cases, the data were collected on a group basis.

Questionnaire

The questionnaire was identical to the one described by Bell *et al.* (1991). The reliability and validity of the instrument is described in their report.

The questionnaire consisted of two parts, one that assessed the subject's knowledge about AIDS and the other that assessed their attitudes toward behaviors that could put someone at risk for AIDS. The knowledge portion[5] (Table II) consisted of 30 factual items that were answered on a true–false/don't know or yes–no/don't know basis. The questions pertained to such issues as mode of disease transmission (e.g., casual, sexual, intravenous), risk group knowledge, and general knowledge. Scores on this portion of the questionnaire could range from 0 to 30.

The attitude portion of the questionnaire (Table III) consisted of 20 items that were answered on a 5-point Likert scale. These questions asked subjects to rate their agreement or disagreement with the item, or to express a judgment concerning the rightfulness or wrongfulness of the item. The right–wrong questions included a "don't know" option. The attitude portion of the questionnaire consisted of five scales that were generated by scaling analysis techniques (see Bell *et al.*, 1991). They included sexual permissiveness, tolerance of homosexuality, behavioral accommodation, issue avoidance, sympathy toward risk groups, and fear/anger toward risk groups.

[5]The term "HIV" is technically more correct than "AIDS" as used in the questionnaire because people do not catch AIDS by sharing needles or engaging in unprotected sex, they become infected with the HIV virus, which can then lead to the manifestation of AIDS (see Tables II and III). On the other hand, it was our desire to administer the questionnaire in its original form, and so this word change was not made. The HIV–AIDS distinction is important, however, and young people should be made aware of it.

Table II. Knowledge About AIDS (Total Sample)[a]

1. Do people get AIDS by shaking hands? (97.10)
2. Do people get AIDS from being in the same room? (97.31)
3. Do people get AIDS from hugging? (96.90)
4. Do people get AIDS from drinking out of the same glass? (79.54)
5. Do people get AIDS by using the same water fountain? (92.97)
6. Do people get AIDS from kissing on the cheek? (93.38)
7. Do people get AIDS from sharing a gym locker? (93.80)
8. People get AIDS from toilet seats. (77.84)
9. Do people get AIDS from sleeping next to someone? (90.08)
10. Do people get AIDS from sexual intercourse? (96.28)
11. Sex is the only way to get AIDS. (88.19)
12. Condoms (rubbers) help prevent AIDS. (82.54)
13. Birth control pills can prevent AIDS. (82.60)
14. Mothers can give AIDS to their unborn babies. (88.63)
15. Women can give AIDS to men during sex. (95.45)
16. Getting married prevents AIDS. (90.08)
17. Do people get AIDS by sharing a (IV) needle to shoot up? (94.62)
18. Do people get AIDS by snorting cocaine? (82.81)
19. Do people get AIDS from using unused sterile needles to shoot up? (59.21)
20. Do people get AIDS from blood transfusions? (85.50)
21. Do people get AIDS by giving blood? (56.72)
22. Using IV drugs can give you AIDS. (52.27)
23. Only homosexuals get AIDS. (88.22)
24. All homosexuals have AIDS. (84.09)
25. Heterosexuals can get AIDS. (82.85)
26. Many lesbians have AIDS. (26.55)
27. If you are heterosexual you won't get AIDS. (80.57)
28. Junior and senior high school students don't get AIDS. (90.49)
29. AIDS is spreading faster among minorities than whites. (21.94)
30. I can tell if someone has AIDS. (81.4)

[a]Percent correct is shown in parentheses.

RESULTS

Knowledge About AIDS

The mean score for the sample as a whole was 24.28, or 81% correct. Although this may seem encouraging at first glance, almost half of the questions (14) were missed by at least 15% of the respondents. As shown in Table II, misunderstandings were most evident about high-risk groups and practices as well as appropriate preventive measures. For example, almost half of the respondents believed that AIDS can be contacted by giving blood but *not* by using IV drugs, whereas only 22% were aware than AIDS is spreading faster among minorities than whites. Seventy-four percent of the sample believed, erroneously, that many lesbians have AIDS. This suggests that many young people attribute AIDS to homosexuality *per se* rather

Table III. Attitudes About AIDS (Total Sample)[a]

	Right				Wrong	
1. Is it right or wrong to smoke marijuana?	Very sure 18	Somewhat sure 9	Unsure 7	Somewhat sure 9	Very sure 49	Don't know 8
2. Is it right or wrong to take IV drugs (to shoot up)?	Very sure 8	Somewhat sure 2	Unsure 5	Somewhat sure 6	Very sure 70	Don't know 9
	Agree				Disagree	
3. It is okay for teenagers to have sex.	Strongly 43	Somewhat 19	Neutral 18	Somewhat 6	Strongly 14	
4. It is okay for me to have sex.	Strongly 47	Somewhat 16	Neutral 16	Somewhat 5	Strongly 16	
	Right				Wrong	
5. Is it right or wrong for some people to be gay?	Very sure 18	Somewhat sure 11	Unsure 15	Somewhat sure 7	Very sure 38	Don't know 11
6. In another country homosexuality is widely accepted. Are they right or wrong?	Very sure 17	Somewhat sure 8	Unsure 18	Somewhat sure 7	Very sure 30	Don't know 20
7. In some states there are laws against homosexuals. Are the laws right or wrong?	Very sure 30	Somewhat sure 8	Unsure 12	Somewhat sure 5	Very sure 24	Don't know 21
	Accept				Reject	
8. Personal acceptance of a gay friend.	Very sure	Somewhat sure	Unsure	Somewhat sure	Very sure	OK but can't be my best friend
	25	13	14	5	31	14

Table III. Continued

	Agree				Disagree
9. I feel I can avoid AIDS by my own behavior.	Strongly 60	Somewhat 15	Neutral 11	Somewhat 3	Strongly 11
10. AIDS will affect my choice of sexual partners	Strongly 65	Somewhat 13	Neutral 8	Somewhat 4	Strongly 10
11. Sexually active people should wear condoms.	Strongly 80	Somewhat 7	Neutral 5	Somewhat 2	Strongly 6
	Agree				Disagree
12. Others have to worry about AIDS but not me.	Strongly 11	Somewhat 5	Neutral 6	Somewhat 6	Strongly 72
13. People in another school have to worry about AIDS but not ours.	Strongly 7	Somewhat 5	Neutral 6	Somewhat 4	Strongly 78
	Agree				Disagree
14. Kids in another neighborhood have to worry about AIDS but not ours.	Strongly 7	Somewhat 3	Neutral 5	Somewhat 4	Strongly 81

	Agree				Disagree
15. AIDS has made me feel sorry for gay/homosexual people.	Strongly 21	Somewhat 14	Neutral 23	Somewhat 19	Strongly 33
16. AIDS has made me feel sorry for IV drug users.	Strongly 18	Somewhat 12	Neutral 17	Somewhat 12	Strongly 41
	Agree				Disagree
17. Because of AIDS I feel more hostile to gays.	Strongly 22	Somewhat 11	Neutral 21	Somewhat 10	Strongly 36
18. Because of AIDS I feel more hostile to IV drug users.	Strongly 24	Somewhat 12	Neutral 22	Somewhat 10	Strongly 32
19. AIDS has made me feel afraid to meet gay people.	Strongly 23	Somewhat 14	Neutral 16	Somewhat 13	Strongly 34
20. AIDS has made me afraid to meet IV drug users.	Strongly 24	Somewhat 12	Neutral 18	Somewhat 14	Strongly 32

[a]The percentage of subjects endorsing each choice has been rounded off to the nearest whole number.

than the unsafe sexual or drug using practices that some homosexuals may engage in.

Analysis of variance was used to determine the relationship of AIDS knowledge to group membership. There was a significant group effect ($F[2,481]$) = 7.79, $p < .0005$), which accounted for 3% of the variability. Tukey's HSD multiple comparison procedure indicated that the SED group had significantly lower knowledge than did the public school students (mean = 25.1, SD = 3.54 vs. mean = 23.3, SD = 4.9). The delinquent population had a mean that approached ($p < .10$) but was not quite significantly different from the other two groups (mean = 24.3, SD = 4.12). The difference between the SED and public school samples remained even if subjects in the two residential treatment programs were removed from the larger Chicago sample. Although the absolute difference between the three group means was relatively small, an exception occurred in a subset of the SED group that did much more poorly than all of the other groups (mean = 19.83, $p < .05$).[6] These subjects came from the residential program in Stockton that treats more severely disturbed adolescents. While the sample size is small (N = 11), the results suggest a correlation between knowledge about AIDS and symptom severity.

Reliable differences were noted on several of the individual items. For example, compared to public school students, delinquents were *less* likely to believe that condoms can prevent AIDS (p = .03) or that heterosexuals, high school students, and minorities in particular are vulnerable to the illness (p = .02). In contrast, the SED group was the most poorly informed about AIDS transmission. They often believed that AIDS could be acquired by casual contact such as drinking out of the same glass or water fountain as a person with AIDS (p = .002), sleeping next to someone with AIDS (p = .002), or by giving blood (p = .01).

There were differences between the AIDS knowledge of the five racial groups ($F[4,451]$ = 8.69, $p < .0001$). Multiple comparison procedures indicated that Caucasian subjects had significantly higher AIDS knowledge than did all other racial groups except Hispanics (Caucasian mean = 25.5, Hispanic mean = 24.3, other mean = 23.1, SE = 4.06). The Hispanic mean was not different from either of the other means. AIDS knowledge was also significantly related to age but not in a manner that might be expected. All terms in a third-degree polynomial regression were significant when using age to predict AIDS knowledge ($F[3,476]$ = 21.8, $p < .0001$). AIDS knowledge slowly increases with age, peaking at age 15. Knowledge then rapidly decreases. However, this finding is wholly due to the 8 subjects over

[6]The other two subsets of SED respondents (the Chicago and larger Stockton group home sample) did not differ from each other.

17 years of age. Without these individuals, a second-degree polynomial is significant. In this situation, AIDS knowledge increases from approximately 20 at ages 9–10 until it peaks and remains stable between ages 14–17. This relationship ignores other significant predictors, however. Similarly, AIDS knowledge linearly increases with grade level ($F[1,457] = 31.3, p < .0001$). In the light of the relationship with age, this is not surprising. In the small selection where SES was known, subjects with low SES had significantly lower AIDS knowledge than did middle or high SES subjects ($F[2,334] = 13.8, p < .0001$). However, there was significantly more variability in AIDS knowledge in the lower SES group than in the other two groups ($p < .02$ by Bartlett's test). The standard deviation in the low SES group was 4.5 vs. 3.3 in the high group and 2.4 in the middle SES group. Not much can be done with this finding because SES was not available in the Chicago sample. SES will not be included in the multiple regression for this reason.

Multiple regression procedures were used to combine all of the predictors that were found to have a significant univariate relationship with AIDS knowledge. The final regression equation included variables contrasting Caucasian subjects with those of other races ($F[1,444] = 25.4, p < .0001$), a variable contrasting SED subjects with the other two groups combined ($F[1,444] = 8.3, p < .0041$), and age as a linear and quadratic predictor ($F[2,444] = 6.7, p < .0014$). In this full model, the Hispanic and other races were found to not be significantly different ($p < .15$). In addition, the public school and delinquent subjects were also determined to not be different ($p < .24$). The final model accounts for 13.9% of the total variability of AIDS knowledge. Figure 1 illustrates the relationship between AIDS knowledge and the three predictor variables.

Attitudes About AIDS

Sixty-three percent of the sample agreed with the assertion that it was acceptable for them to have sex and almost the same percentage believed it was acceptable for other teenagers to have sex, if they wanted. The subjects were considerably more permissive about their sexual freedom than about their right to use marijuana (27%) or intravenous drugs (10%). An exception might be if the person were gay, as 45% of the sample believed that homosexuality was wrong.

Although the majority of respondents believed it was okay for them to be sexually active, 87% of them also believed that sexually active people should wear condoms or take other protective measures. A similar percentage (78%) said the AIDS epidemic would affect their choice of sexual partners and that they could avoid AIDS by acting responsibly (75%).

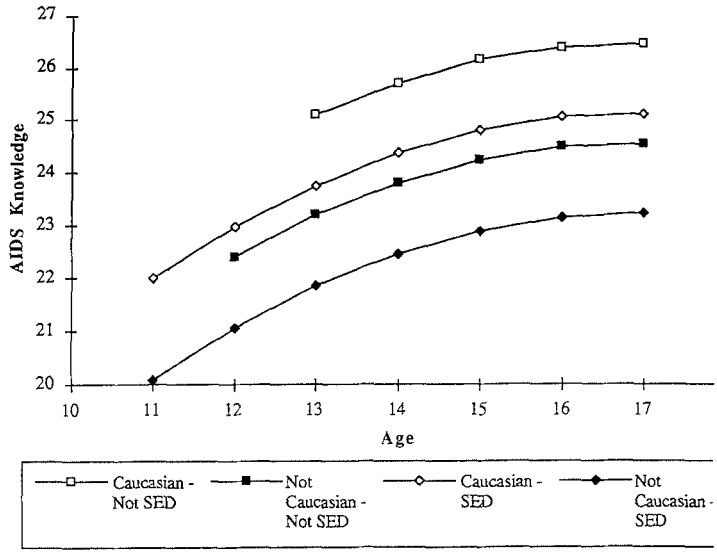

Fig. 1. Relationship between AIDS knowledge and the three predictor variables.

Most respondents (65–70%) were either neutral or unsympathetic toward those in high-risk groups. Most of them (63–67%) also said the AIDS epidemic had not increased their fear or hostility toward gays and intravenous drug users.

The attitudes about AIDS items clustered into seven factors on the basis of a principal components analysis with varimax rotation. The average attitude on the items in these seven factors were then analyzed for group differences and for differences attributable to gender, race, and age. Only the significant differences are reported here. The first two items measured the acceptability of marijuana and intravenous drug use. The delinquent subjects found drug use more acceptable than did either of the other two groups ($F[2,448] = 8.73$, $p < .0002$). The average delinquent subject was "unsure" about marijuana use whereas the SED and school groups were "somewhat sure" that marijuana use was wrong. The two items on sexual permissiveness showed that females were less permissive ($F[1,453] = 17.5$, $p < .0001$) and that sexual activities became more acceptable with age ($F[2,453] = 12.1$, $p < .0001$). In addition, the public school students were less permissive than either the SED or delinquent sample ($F[2,453] = 14.0$, $p < .0001$). The average public school student was "neutral" to "somewhat

agree" on sexual permissiveness, whereas the other two groups averaged between "somewhat agree" and "strongly agree." The four items measuring the acceptability of homosexuality showed that males ($F[1,458] = 29.7$, $p < .0001$) and delinquent subjects ($F[2,458] = 3.75$, $p < .024$) are less accepting. Delinquent subjects generally found homosexuality "somewhat sure" to be wrong whereas the other subjects were "unsure." The older subjects ($F[1,459] = 7.3$, $p < .0007$) and public school students ($F[2,459] = 7.2$, $p < .0009$) were more confident that they could avoid AIDS by their behavior (Items 9–11). Public school students more "strongly agreed" that they could avoid AIDS whereas the other students "somewhat agreed." In contrast, the SED subjects had more of a "others have to worry about AIDS but not me" attitude (Items 12–14, $F[2,466] = 8.9$, $p < .0002$). The SED subjects "somewhat disagreed" with these attitudes whereas the other subjects averaged between "somewhat" and "strongly disagreed." The two items concerning feelings of sorry for gays and intravenous drug users showed no group differences but white subjects were less compassionate ($F[1,458] = 25.0$, $p < .0001$). The last 4 items measured feeling of hostility and fear toward gays and drug users. There were no group differences but females ($F[1,448] = 10.1$, $p < .0016$) and older subjects ($F[2,448] = 3.88$, $p < .0212$) were less hostile and fearful.

A moderate correlation ($Rxy = .45$) was noted between knowledge scores and the issue avoidance factor, which indicates that the respondents who were better informed about AIDS were more realistic about personal risk and somewhat more inclined to take steps to avoid them ($Rxy = -.29$).

DISCUSSION

The results suggest that incarcerated delinquents tend to be slightly less informed about AIDS than public school students, which is consistent with the findings of DiClemente *et al.* (1991). More significantly, the results showed that teenagers with emotional and behavior problems are even more misinformed than delinquents when compared to our sample of high school students. This is a new and potentially important finding for targeting high-risk groups.[7] Areas in which misunderstandings occurred most often were mode of transmission and awareness of high-risk groups. Edu-

[7]We (Katz *et al.*, 1994) have replicated the present study with a group of chronic mentally ill adults ($N = 54$) and again found widespread misunderstandings about HIV transmission, high-risk groups, and practices. We also observed a significant correlation between misinformation about AIDS and the frequency of high-risk behaviors. Taken together, the results of these studies underscore the immediate need for comprehensive AIDS education, intervention, and prevention in psychiatrically disturbed populations.

cational programs about AIDS should be tailored to overcome these deficits.

Knowledge about AIDS is one thing; making use of the knowledge is another. In this regard, the sample as a whole was more permissive in attitudes about sexual freedom than illicit drug use, especially intravenous drug use. One of the more positive findings was that the vast majority of respondents believed that sexually active people should wear condoms and be careful in their choice of sexual partners. Our sample of delinquents was most likely to take exception to this, and also to be more accepting of drug use. Interestingly, the SED group we surveyed tended to be indistinguishable from our high school sample in their attitudes about AIDS, even though they were less well informed about the disease. The one area where they differed was perceived vulnerability to the illness. Of the three groups, those with emotional difficulties displayed the most denial, as if to say AIDS may be a problem for others but not for them.

Where knowledge and attitudinal differences existed, the absolute magnitude was often small and influenced by demographic variables (e.g., sex, SES, age). Generally speaking, younger, non-Caucasian males from low SES backgrounds tended to know less about AIDS and to espouse attitudes that could increase their vulnerability to the illness.

One of the main implications of these findings is that adolescents who are relatively uninformed about AIDS tend to be the same ones who are most at risk for the disease, feel the least empowered to protect themselves, show the most denial of vulnerability, and are least inclined to change behaviors that could reduce their level of risk. From a prevention standpoint, there is clearly a need to target both youthful offenders and teenagers with psychiatric problems for AIDS prevention programs. Furthermore, the need for a comprehensive intervention (aimed at AIDS education, risk appraisal, and efforts at attitude, attribution, and overt behavior change) may be greatest in delinquents because of their propensity for high-risk practices. Many important questions still need to be addressed in this area. Chief among them are the design of an appropriate intervention and assessment of its efficacy for long-term behavior change.

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