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Perceived Risk of AIDS Among Prisoners Following Educational Intervention

Dr. Angela D. West
& Randy Martin

ABSTRACT

A pre/post quasi-experimental design was used to assess the impact of one state's AIDS education program on male (N= 75) and female (N= 65) inmates' perceived risk of HIV infection on the street and in prison. Post-test only comparison groups of male and female inmates were evaluated to control for the threat of testing. T-tests for paired samples were used to determine whether any significant changes occurred within groups (male & female), and t-tests for independent samples were used between groups to determine whether males or females experienced the greatest magnitude of change. Multiple regression analyses explored the relationships between selected independent variables, post-test perceptions, and magnitude of change. The men's levels of perceived risk declined significantly from pre- to post-test, whereas the women's increased (although not significantly) in two of three areas. Regression analyses indicated that change in perceptions was related to various variables (e.g., sex) outside of the prison's control. Implications are discussed, and suggestions are offered for modifying current prison-based programs.

INTRODUCTION

The primary marker of concern related to HIV disease has been the cost of the pandemic in terms of human lives; as of December 31, 1998, the Centers for Disease Control and Prevention (CDCP, 1998) had been notified of 410,800 deaths from among the 679,739 total number of diagnosed adults (age 13 and older). Thus, about 60% of diagnosed individuals have already died.

Since the first cases were reported in the early 1980s, HIV disease has been primarily associated with certain sets of exposure categories. Until recently, "men who have sex with men" defined the most at-risk group in the United States, and while they still comprise the largest number infected (about 48% of all diagnoses),

their percentage of new infections has slowed compared to the growing numbers of individuals in other exposure categories (CDCP, 1998).

The exposure category of “injecting drug use” (IDU), for example, is now the overall fastest growing category. Through December 31, 1998, this type of transmission accounted for 26% of all diagnosed AIDS cases among adults in the U.S. (CDCP, 1998). One reason for its phenomenal growth is the increasing likelihood that women who are newly diagnosed will have IDU as their primary risk factor. In fact, IDU is the dominant exposure category for women, accounting for 43% of their diagnosed cases, while accounting for only 22% of men’s diagnoses (CDCP, 1998).

A rapid growth in the number of cases acquired through heterosexual contact also is correlated with an increase of HIV among women. Although only about 10% of all seroconversions have been attributed to heterosexual transmission (CDCP, 1998), women are much more likely to acquire the virus this way; 39% of diagnosed women have heterosexual contact as their risk factor, compared to only 4% of diagnosed men. More telling is that this category is the only one where women actually outnumber men (CDCP, 1998).

HIV/AIDS Among the Incarcerated

The problems of HIV acquisition and transmission continually are addressed as they relate to members of the general population. Among incarcerated populations, however, they have been under-addressed even while the rate of confirmed AIDS cases among State and Federal prisoners is about six times the rate among members of the general U.S. population (Hammett, Harmon & Maruschak, 1999).

State and federal prisons experienced a 42% increase in the number of HIV positive inmates from 1991-1996. During 1996 alone, 29% of all state inmate deaths were AIDS-related, with 65% of inmate deaths in Connecticut, 55% of deaths in New York, 52% in New Jersey, and 50% in Florida being attributable to AIDS. Overall, AIDS was responsible for 1 in 3 inmate deaths from 1991-1996, compared to a 1 in 10 ratio among the general population (Hammett et al., 1999).

IDU Among Prisoners

Higher rates of HIV infection among inmates are associated with higher rates of participation in IDU (Tewksbury, Vito & Cummings, 1998). Although it is often difficult to determine the number of individuals with IDU as an exposure category,

the majority of inmates in most state institutions would have IDU as their exposure category (see Gido & Gaunay, 1988, and Morse, 1990). It is so likely to be a factor that the incidence of AIDS in prison is similar to the incidence of AIDS among the IDU population (Davis-Berman & Brown, 1990).

In a recent survey of HIV/AIDS cases in correctional facilities, 4.6% of inmates who reported ever injecting drugs were HIV positive, as were 7.7% of those who ever shared needles for injection (Hammett et al., 1999). Harlow (1993) also reported that needle use increased the likelihood of being HIV-positive, especially for women. Almost seven percent (6.7%) of the women in her study who had ever used a needle to inject drugs and 10% who had ever shared a needle were found to be HIV-positive, compared to only 4.7% and 6.7% of the men (respectively). Therefore, issues relating to IDU (i.e., proper needle cleaning, sharing of drug use equipment or “works”) are particularly important to incarcerated individuals, especially as they pertain to HIV infection.

Race/Ethnicity and Sex as Contributing Factors

In 1990, 55% of all diagnosed AIDS cases in the United States were among Whites, 28% among Blacks, and 16% among Hispanics (CDC, 1991). By the end of December 1998, 44% were among Whites, 37% among Blacks, and 18% among Hispanics (CDCP, 1998). These figures represent an 11% shift in cases from Whites to other races/ethnicities, which reflects the more rapid growth of HIV disease among these populations.

Black and Hispanic inmates with HIV/AIDS are over-represented as they are among the non-incarcerated. Hammett et al. (1999) found that of all inmates ever tested through 1997, 2.8% of the Black and 2.5% of the Hispanic prisoners were HIV-positive, compared to just over one percent (1.4%) of the Whites. The relationship between race/ethnicity and HIV/AIDS is especially important for women. A total of 78% of all cases among women have been diagnosed among minority women, compared to a 51% rate among minority men (CDCP, 1998).

In state correctional facilities, the percentage of female inmates who test positive for HIV infection is higher than that of males (Hammett et al., 1999), but this pattern is also mitigated by race/ethnicity. Hispanic women prisoners have the highest overall rate of infection; 4.2% are HIV-positive. Black men have the next highest rate of infection (2.7%), followed by Black women (2.5%), Hispanic men (2.4%), White women (2.3%), and White men (1.4%) (Hammett et al., 1999).

Problem Statement

Few prison-based AIDS education programs have been systematically evaluated, even though nearly every state has one (Hammett et al., 1999; Martin, Zimmerman, & Long, 1993). While HIV/AIDS education and prevention programs in correctional facilities are commonplace, most programs lack the comprehensiveness required to effectively address HIV/AIDS issues (Hammett et al., 1999). In fact, only about 10% of State/Federal systems offer comprehensive programs in all of their facilities; “comprehensive” programs include “instructor-led education, peer-led programs, pre- and posttest counseling, and multisession prevention counseling” (Hammett et al., 1999, p. 27).

Moreover, the relevance of these programs for female and minority inmates only rarely has been assessed. In many areas, issues and problems affecting women and minority populations have been severely neglected (Gido, 1992), and the effects of AIDS education programs are no exception. Martin et al. (1993), for example, report that of 42 states with programs for male and female inmates, 35 (83%) used the same program with both populations.

Persons with histories of high-risk behaviors (IDU, needle sharing, frequent unprotected sex) are dramatically overrepresented in correctional institutions (Hammett & Daugherty, 1991), and given the politics and law enforcement practices of the last decade, our prisons probably will continue to house more at-risk individuals (Gido & Gaunay, 1987; Hammett & Daugherty, 1991; Hammett et al., 1999; Magura, Rosenblum & Joseph, 1991; Morse, 1990; Olivero & Roberts, 1989). In fact, Hammett et al. (1999) state that although the HIV epidemic seems to be lessening among some portions of the population, it has developed “increasing concentration among the poor and people of color, the populations from which the majority of inmates are drawn” (p. 1), and that “women are increasingly affected” (p. 2).

If the opportunity for providing these individuals with adequate education about the prevention and transmission of HIV is not taken, they will most likely not be educated at all (Tewksbury et al., 1998). The prison environment affords a unique opportunity for providing HIV education because the “students” are literally a captive audience. They are not faced with many of the distractions they might normally face on the outside (availability of drugs, partners for sex, peer pressure to steer clear of education). Thus, prison systems that employ an unevaluated, potentially ineffective AIDS education program may be missing an opportunity to inform and affect the behavior of their inmates and society in general.

This study examines a program's impact on both men and women because, historically, these programs have been created by and for men and have been generalized to apply to women. Incarcerated women who are receiving AIDS education targeted at men are not likely receiving the type of information required for them to modify their behavior. Additionally, such programs may not be presented in ways to produce optimal learning and behavior change among women.

This paper presents a sub-set of results from part of a larger project that addressed the need for systemic responses to HIV in the following ways: (1) by assessing one state's prison-based AIDS education program and its impact on the knowledge, perceptions, and behavioral intentions of both men and women prisoners; and (2) by interviewing the women to provide more in-depth data about their HIV-related concerns and needs. This paper focuses on the portion of this larger project that assesses the program's impact on inmates' perceptions of risk of HIV infection.

REVIEW OF LITERATURE

It is difficult to determine the risk of acquiring HIV infection in the prison environment, but there is at least some risk (Hammett et al., 1999). With increasing percentages of inmates testing HIV-positive and reporting relatively high frequencies of engaging in risky behaviors, it seems logical that intra-prison seroconversions would also increase, even though they have historically been quite low (Brewer, Vlahov, Taylor, Hall, Munoz, & Polk, 1988; Horsburgh, Jarvis, McArthur, Ignacio & Stock, 1990).

One actually does not have to be at risk to feel at risk. Zimmerman, Martin, and Vlahov (1991) found that inmates who reported low frequencies of high-risk behavior still perceived themselves to be at risk of infection. Zimmerman and his colleagues confirmed that low levels of reported high-risk behavior are consistent with low rates of intraprisson transmission and reasoned that the prisoners must have overestimated their risk because of deficits in knowledge. An alternate explanation may be that the inmates did not overestimate their risk, but instead under-reported their high-risk behaviors.

Because risky behaviors are common among criminal justice clients nationally, the potential for the spread of HIV through this population, and ultimately back into the community, is disturbingly high (Magura et al., 1991; Tewksbury et al.,

1998). We may never know, however, the exact prevalence of infection within our facilities. As of 1997, only 16 jurisdictions conducted testing of all entering inmates, two tested all inmates in custody, and four tested inmates upon release (Hammett et al., 1999).

Correctional institutions contain persons likely to have practiced risky behaviors before incarceration, some of whom continue those practices within the prisons, and most of whom will continue those behaviors when they return to their communities. These same people also are most likely to be re-incarcerated.

Education Programs for Inmates

The prison setting provides a unique opportunity to present HIV/AIDS related information, to study the results of that presentation, and to modify attempts based on deficits that may be revealed upon evaluation (Martin, Zimmerman, Long & West, 1995). Incarcerated individuals are captive audiences within an environment much more conducive to learning than the environments from whence they came (Baxter, 1991).

While almost every state has implemented some type of HIV/AIDS education program (Hammett et al., 1999; Martin et al., 1993), there are considerable differences among these programs as to their modes of presentation and content. More importantly, systems and facilities often claim to offer certain things, but fail to deliver them as promised. For example, only 57% of facilities claiming to provide mandatory intake education actually provide it (Hammett et al., 1999). These differences represent potentially serious constraints on program effectiveness and on our ability to understand the reality of education programs within our correctional facilities.

By most accounts, certain types of programs are more effective than others. For example, peer-led programs seem to be the most effective approach, yet only 41% of systems and only 13% of facilities within those systems provide peer-led programs for their inmate populations (Hammett et al., 1999).

Many state programs also have questionable content; they often lack crucial information, present inaccurate information, or fail to address issues relevant to prison populations in ways that are easily understood. It is also problematic that existing educational programs provide very little information to inmates about changing risk behaviors (Hammett & Daugherty, 1991; Hammett et al., 1999; Martin & Zimmerman, 1990; Martin et al., 1995). Although nearly all systems

now offer basic HIV information, including information regarding the meaning of HIV tests, fewer systems provide topics pertinent to risk reduction. In fact, only 67% claim to provide information related to safer sex practices, 41% on negotiation skills for safer sex, 45% on safer injection practices, and 57% on triggers for behavioral relapse (Hammett et al., 1999).

Even when inmates are informed of preventative behaviors, it is unrealistic to expect AIDS programs designed to alter risky behaviors to be effective in prison. Bleach and condoms, ordinary precautions available outside, are usually forbidden by the institution; only two state systems make condoms available, and only 10 systems make bleach available (Hammett et al., 1999). Therefore, Martin and Zimmerman (1990, p. 345) argue that “the pressures of public morality (inhibiting the availability of condoms and needles) and the demands of security (no bleach) effectively inhibit some of the most meaningful preventative responses to HIV transmission.”

Most state programs also fail to account for cultural and linguistic differences among their inmate populations (Hammett et al., 1999; Martin et al., 1995). A recent study indicates that 39% of state systems now offer sessions in Spanish, with 51% offering educational materials for Latinos and 41% offering materials especially for African-Americans (Hammett et al., 1999). With over 50% of all AIDS diagnoses in the general population among non-whites (CDCP, 1998) and over 50% of all prison inmates being non-white (Beck & Mumola, 1999), “the lack of attention to [cultural and linguistic] differences among inmates has created a profound weakness in most prison-based AIDS education programs” (Martin et al., 1995, p. 22).

Inmate Programs for Women

Another severely deficient area in prison-based education programs relates to the concerns of female inmates. In general, issues pertaining to incarcerated women are often neglected or ignored (Hammett & Daugherty, 1991; Gido, 1992). However, the number of women in state and federal institutions grew from 13,000 to 84,427 between 1980 and 1998 (Beck & Mumola, 1999), and although women currently account for only a small proportion (around 16%) of all AIDS cases (CDCP, 1998), they are the fastest growing population acquiring HIV.

As previously mentioned, 35 of 42 states (83%) with programs for male and female prisoners report using the same program with both populations (Martin et al., 1993), and only one program from 27 responding states indicates any content

focusing on sex-specific issues/needs (Martin et al., 1995). Hammett et al. (1999) report that 84% of state systems have educational materials especially for women, but actual practice in the facilities may be significantly different. It is strongly suggested that any future efforts to assess and modify prison-based AIDS education programs explicitly address the special needs of female inmates (Keeton & Swanson, 1998; Martin et al., 1993).

RESEARCH DESIGN

This study used a quasi-experimental pre-test/post-test design to evaluate one state's HIV/AIDS education program. Male and female cohorts of inmates entering the state's prison system were asked to respond to a survey regarding their HIV/AIDS-related knowledge, attitudes, and perceptions. Pre-test and post-test perceived levels of risk were assessed for each cohort (male & female) before and after participating in the state's HIV/AIDS education program.

In the experimental condition, these cohorts were given a pre-test before the program and a post-test approximately one month after the program, but before they were released into the general population. A randomly selected post-test only comparison group was also surveyed to determine whether observed changes in experimental group scores from the pre-test to the post-test might be attributable to testing effects. The comparison group had already participated in the AIDS education program, but had not been pre-tested.

The System and Its Program

During this research, the women's facility housed 90% of the state's female inmates (888 inmates: 56% Black, 35% White, 9% Hispanic, and < 1% of other racial/ethnic origins) and was the only intake center for women in the state. The men's facility was one of four in the state that served as an intake center and was chosen for its representativeness to the other men's facilities in the state. It was also the largest state facility, housing 3,050 inmates (49% Black, 39% White men, 12% Hispanic, and <1% of other racial/ethnic origins).

This state's HIV/AIDS education program (which has since been altered) consisted of the distribution of pamphlets on request and the presentation of a video (approximately 30 minutes long), created in 1986 by the state for use with its male inmates, to all new inmates (male and female) at intake. The video presents two official-looking White men who identify themselves with the state system and a

physician, another White man in a lab coat. The video is only presented in English, although a limited number of pamphlets are available in Spanish.

The video contains no mention of acquisition and transmission modes unique to women. High risk behaviors, in general, are all but ignored. The speaker, however, does urge the viewer to “act in a responsible, adult manner.” While the video gives brief mention to the role of “passive anal intercourse” as the “primary mode of transmission” (erroneous information for the women), it only mentions heterosexual contact as a risk factor when it stresses that the virus is passed from women to men as often as it is from men to women (again, erroneous information).

IDU is discussed in reference to “contact with infected blood,” but not in reference to contact with the semen of an infected IDU. The doctor in the video, however, does advise inmates to avoid “contact with bodily fluids.” Also missing are explicit references to the sharing of IV needles or “works,” even though the doctor does fleetingly suggest to “avoid needle sharing” as a “practical way to avoid [HIV] in the correctional facility.” More importantly, near the end of the video, the presenter summarizes the doctor’s recommendations for avoiding HIV in the correctional setting (“avoid contact with bodily fluids,” “avoid needle sharing”) as “don’t share razors,” “don’t tattoo,” “wash well with soap and hot water,” and “clean up spills of body fluids with disinfectant.” He then summarizes ways to prevent infection after release or while on furlough as “limit sexual partners,” “use condoms,” and “don’t share needles.”

It is presented in the video that the most common symptoms of HIV infection are weight loss, night sweats, fatigue, the development of a persistent cough (indicative of pneumonia), and raised, scaly lesions (indicative of Kaposi’s sarcoma). Among men, these are accurate symptoms. Among women, they are not. The most common symptoms among women are gynecological problems, such as candidiasis, cervical dysplasia and cancer, severe and persistent vaginitis, and herpes zoster. Women rarely get Kaposi’s sarcoma (Schoenbaum & Webber, 1993).

SAMPLING

Only incoming inmates who had not yet participated in the prison’s AIDS education program were eligible members of the experimental group. Sixty-five out of the 89 (73%) women and 75 out of the 120 (63%) men who were contacted about participation successfully completed both the pre-test and the post-test

phases of the project. Demographic and descriptive information were collected from each sample and are summarized in Table 1.

□ **Table 1: Demographic and Descriptive Information by Sex**

	<i>MALES (N = 75)</i>	<i>FEMALES (N = 65)</i>
Known HIV+	2.7%	3.1%
Age (mean)	30 years	33 years
Years of education (mean)	11.4 years	11.2 years
< HS	37%	48%
HS graduate	44%	32%
At least some college	19%	20%
Race/Ethnicity of Inmate		
Black	49%	47%
White	32%	38%
Hispanic	17%	8%
Other	<2%	7%
% with children	60%	70%
% with prior HIV/AIDS education	68%	69%
% in prison before	25%	23%
Median sentence length	44 months	36 months

Most of the men and women were of races/ethnicities other than White, with average education levels of less than 12 years. They had children at home, had prior experience with HIV/AIDS education, and many had been in prison before. Most importantly, 2.7% of the men and 3.1% of the women reported knowing that they were HIV-positive.

In general, each sample adequately represents the national population of prisoners (Table 2), with a couple of exceptions. Among the sample of women,

Black women and those of other racial/ethnic origin are over represented, and Hispanic women are underrepresented compared to the national population. Additionally, fewer women in the sample report having children at home, and women in the sample were more likely to have less than 12 years of education. Again, men in the sample were more likely than men in the national population to report less than 12 years of education.

The comparison groups (male and female) each were randomly selected from all available inmates in each prison's general population. Unless otherwise noted, data collection procedures were the same for all groups.

□ **Table 2: Demographic and Descriptive Comparison of Male and Female Samples to the Populations of Male and Female Inmates**

	FEMALES		MALES	
	Sample N = 65	Population* N = 71,318	Sample N = 75	Population* N = 888,721
AGE	33 yrs. (mean)	50% between 25-34	30 yrs. (mean)	45% between 25-34
RACE				
Black	47%	36%	49%	46%
White	38%	46%	32%	35%
Hispanic	8%	14%	17%	17%
Other	7%	4%	<2%	2%
EDUCATION				
< High school	48%	42%	37%	27%
High school grad	32%	43%	44%	47%
Some college	20%	16%	19%	12%
% WITH CHILDREN	70%	78%	60%	64%

*Maguire, K., and Pastore, A. (1994). *Sourcebook of Criminal Justice Statistics-1993*. (USDOJ, Washington, D.C.: U.S. Government Printing Office).

DATA COLLECTION

After eligible participants were contacted, informed, and had agreed to participate, between 20-25 of them were gathered in the testing room at the diagnostics center and were given a pre-coded answer packet. General procedures were explained, and each item and possible answer was read to the group twice, with clear instructions in responding to the different types of questions. Questions and possible answers were also printed on large posterboard to provide guidance.

Survey

This study used a modified and updated version of the AIDS Knowledge and Attitudes Questionnaire (AKAQ), previously used by Celentano et al. (1990) with Maryland inmates and by Zimmerman et al. (1991) with Pennsylvania inmates. The AKAQ traditionally has consisted of four content areas: general knowledge, knowledge of unlikely routes, knowledge of likely routes, and knowledge of sexual prevention. While most of the survey remained the same for the current study, it was necessary to make minor modifications. A fifth content sub-area was added to determine knowledge of HIV prevention methods involving drug use. In addition, questions about past behaviors, perceived risk, sources of information, and behavioral intentions were included.

Perceptions of Risk

Perceptions of risk relate to a person's beliefs about his/her likelihood of becoming infected with HIV. To perceive risk, a person must appreciate and understand the components involved in HIV disease (e.g., modes of transmission, modes of prevention, the virus). In short, a person must understand information about the various components associated with HIV disease to assess the probability that those components will adversely affect him or her.

To measure perceptions of risk, inmates were asked to estimate their risk of acquiring the virus while on the street and their risk of acquiring the virus while in prison. The method of responding to these items was via a 10 cm long magnitude estimation scale, with "definitely will not" on the far left side corresponding to 0cm, and "definitely will" on the far right side at 10cm. The respondents were then asked to make a mark on the line in the position that best corresponded to their personal perception of risk. The distance from 0cm was measured and averaged for each respondent on each survey item. Those inmates who knew they were already HIV-positive were asked to check a box and not make any marks on the lines.

These two variables also were combined to measure “overall perceptions of risk” for each sex.

ANALYSIS AND RESULTS

The data are compared in two ways, within groups and between groups. Data are compared within-group (male pre- vs. post-, female pre- vs. post-) to determine the impact of the program on mean levels of perceived risk inside of and outside of the facility (Were there changes in levels of perceived risk after participation in the program?). Data are compared between groups (male vs. female) to determine with which group the program was most effective (Which group changed the most after participation in the program?). Conclusions are made about which group was more receptive and/or responsive to the program when one group exhibits a greater change (increase or decrease) in any of the areas. Additionally, such data indicate where information might be lacking.

Post-test data from the experimental group (male & female) were also statistically compared to the comparison group, which participated in the program and the post-test, but not the pre-test. This was done to determine the extent to which testing effects influenced the data from the experimental groups. If taking both a pre-test and a post-test had no effect, the comparison group data should have been comparable to the experimental group data. If the experimental group data (which had 2 tests) is significantly different from the comparison group data (which had 1 test), it is possible that changes in the experimental group can be attributed to the testing process and not to the education program.

Within-Group Analysis: Program Impact on Overall Perceived Risk

An “overall perceived risk” index was created by combining the two survey items that assessed each inmate’s “perceived risk on the street” and “perceived risk in prison.” To determine the program’s impact on these perceptions, each group’s (male & female) mean pre-test perception of risk was compared to its mean post-test perception of risk by a t-test for paired samples (Table 3).

Only the men showed significant change in overall perceived risk from the pre-test (M= 2.51) to the post-test (M= 1.71), $t(74) = 2.47$, $p < .02$, indicating their feelings of being at risk decreased between the pre- and post-test. Much of this change was realized because the men’s perceptions of risk on the street were significantly decreased from the pre-test (M= 3.41) to the post-test (M= 1.93),

$t(72) = 3.88, p < .00$. The men's perceptions of risk in prison remained (statistically) the same. Conversely, the women showed an (statistically non-significant) increase in overall perceived risk, from a mean of 2.43 to a mean of 2.74, mostly due to an increase in their perceived risk of infection in prison.

□ **Table 3: T-Tests for Paired Samples of Pre- and Post-Test Perceived Risk by Sex**

<i>MALES</i>					
<i>VARIABLE</i>	<i>N</i>	<i>MEAN</i>	<i>SD</i>	<i>SE</i>	
pre-overall	73	2.507	2.526	.296	
post-overall	73	1.712	2.634	.308	$t(72) = 2.47, p < .02 *$
pre-street	73	3.411	3.274	.383	
post-street	73	1.932	2.869	.336	$t(72) = 3.88, p < .00 *$
pre-prison	73	1.603	2.650	.310	
post-prison	73	1.493	2.863	.335	$t(72) = .30, p < .77$ (NS)
<i>FEMALES</i>					
<i>VARIABLE</i>	<i>N</i>	<i>MEAN</i>	<i>SD</i>	<i>SE</i>	
pre-overall	60	2.425	2.111	.273	
post-overall	60	2.742	2.779	.359	$t(59) = \square 1.10, p < .28$ (NS)
pre-street	62	3.032	2.734	.347	
post-street	62	3.016	2.934	.373	$t(61) = .05, p < .96$ (NS)
pre-prison	60	1.883	2.084	.269	
post-prison	60	2.467	3.154	.407	$t(59) = \square 1.73, p < .09$ (NS)

Note. Perceived risk runs from 0 (no chance) to 10 (absolute certainty)

*Significant, $p < .05$

Because the men's levels of perceived risk significantly decreased, their post-test levels were compared to the men's post-test only comparison group levels on the areas where there was significant change (perceptions of risk on the street and

overall perceptions of risk) (Table 4). For both overall perceived risk and perceived risk on the street, the significant change among the men may have been an artifact of the testing process. The perceptions of the experimental group on both overall perceived risk and perceived risk on the street ($M_s = 1.76, 1.97$, respectively) were significantly lower (i.e., they perceived themselves less at risk) after the program than the perceptions of the men in the comparison group ($M_s = 2.79, 3.61$, respectively), who perceived themselves to be at higher risk ($t(118) = 2.08, p < .04$). Both groups of men had been through the AIDS education program; thus, their perceptions should have been relatively equal. Men in the experimental group, however, received the same questionnaire twice within a month, which may have contributed to their significant change.

Table 4: T-Tests for Independent Samples of Experimental Post-Test and Post-Test Only Comparison Groups' Perceived Risk

Overall Perceived Risk

<i>GROUP</i>	<i>N</i>	<i>MEAN</i>	<i>SD</i>	<i>SE</i>	
Experimental	74	1.76	2.643	.307	
Comparison	46	2.79	2.687	.396	$t(118) = 2.08, p < .04^*$

Perceived Risk on the Street

<i>GROUP</i>	<i>N</i>	<i>MEAN</i>	<i>SD</i>	<i>SE</i>	
Experimental	74	1.97	2.872	.334	
Comparison	46	3.61	3.109	.458	$t(118) = 2.94, p < .00^*$

*Significant, $p < .05$

The significant difference between the groups of men may also be explained by time within and experiences related to the prison environment. The experimental group men had only been incarcerated a maximum of one month, whereas the comparison group came from the general population. Therefore, it is unclear

whether the testing process contributed to change, or whether there was actual change among the men. Although the testing process might have contributed to change among the men, discussion still centers around the possibility that the program could have had some impact.

Between-Group Analysis: Differential Impact on Perceptions of Risk

The men’s mean change from pre- to post-test (although perhaps affected by the testing process) was compared to the women’s mean change on perceived risk (on the street, in prison, and overall). New variables were created to represent the magnitude of change from pre-test to post-test, and t-tests for independent samples were again used, along with ETA square (2) to indicate the proportion of error reduced in predicting change when the sex of the participant is known (Table 5).

□ **Table 5: T-Tests for Independent Samples Comparing Mean % Change in Perceived Risk by Sex**

	N	MEAN % CHANGE	SD	SE
<i>Change in Perceived Risk on the Street</i>				
Female	62	□.016	2.538	.322
Male	73	□1.480	3.258	.381
t (132) = □2.93, p < .00*				
η ² = .05				
<i>Change in Perceived Risk in Prison</i>				
Female	60	.583	2.619	.338
Male	73	□1.110	3.169	.371
t (131) = 1.38, p < .17 (NS)				
<i>Change in Overall Perceived Risk</i>				
Female	60	.317	2.230	.288
Male	73	□.795	2.747	.322
t (131) = □2.57, p < .01*				
η ² = .06				
* Significant, p < .05				

The men and women showed significant differences in magnitude of change in responding to items that measured their perceived risk on the street, $t(132) = 2.93$, $p < .00$, and their perceived risk overall, $t(131) = 2.57$, $p < .01$. Very little prediction error, however, is reduced by knowing sex. Only six percent ($R^2 = .06$) of all the variation in change from pre- to post-test perceived risk on the street and only five percent ($R^2 = .05$) of the variation in change on overall perceived risk is explained by sex. With 94-95% unexplained variation, there are several important variables or sets of variables other than sex that contribute to change in these areas. Some important possibilities are discussed below.

This magnitude of difference was expected because of the development and implementation of the state's program. Because the change in perceived risk was significantly greater for the men than for the women, the program had a greater impact on the men's perceptions of risk. In all areas, the men's perceived risk levels decreased from feeling more to feeling less at risk. The women's perceived risk levels increased following the program (except in risk on the street, which was lowered by .02) from feeling less to feeling more at risk. Because there was no significant difference between the changes in perceived risk in prison, the program had similar effects on each sample's perceptions.

REGRESSION ANALYSES

Ordinary least squares regression equations were constructed to investigate significant changes to perceptions following the program. This was done in two ways. First, the areas in which significant differences were noted in magnitude of change by sex (between-group) were used as dependent variables to determine to what extent sex affected change (Table 6). Two areas involved significantly different changes by sex: (1) change in perceived risk on the street; and (2) change in overall perceived risk. Since neither the men nor the women indicated significant change in their perceived risk in prison, no further investigation was necessary.

Second, the perceptions of risk for each group (male & female) that significantly changed after the program (within-group) were used as dependent variables to determine what factors might have contributed to those changes among each sex. Because there were no significant changes in perceived risk among the women, no regression equations were necessary around change for the women. As a result, equations were only necessary for the two areas in which the men showed significant change from pre- to post-test: (1) perceived risk on the street; and (2) overall perceived risk.

□ **Table 6: Ordinary Least Squares Regression Equations:
Predicting Pre- to Post-Test Change in Perceived Risk
Among Male and Female Inmates**

	<i>B (slope)</i>	<i>SE (slope)</i>	<i>95% CI</i>		β
<i>Perceived Risk on the Street</i>					
Change in perceived risk in prison	.48	.08	.33	.64	.47
Sex of inmate	1.19	.45	.30	2.09	.20
Multiple $R^2 = .28$ $Se = 2.58$ $F = .0000$					
<i>Overall Perceived Risk</i>					
Change in behavioral intentions	□.34	.14	□.61	□.06	□.21
Sex of inmate	.95	.42	.11	1.78	.19
Years of education	.30	.14	.02	.57	.18
Multiple $R^2 = .11$ $Se = 2.36$ $F = .0030$					

Note. Behavioral intentions were measured from 0 (absolutely no intention to engage in risky behavior) to 10 (absolute certainty that I will engage in risky behavior). Therefore, greater change meant more movement toward zero (and safer intentions).

Predicting Change Between Groups: Perceived Risk on the Street

A correlation matrix showed that two variables, “sex” and “change in perceived risk in prison,” were significantly correlated ($p < .05$) with “change in perceived risk on the street.” Twenty-eight percent of the variation in change in perceived risk on the street is explained by these two variables ($R^2 = .28$). Both independent variables are directly related to change in perceived risk on the street. Inmates whose perceptions of risk in prison changed after the program also had changed perceptions of risk on the street, and male inmates were more likely than female inmates to change their perceptions of risk on the street. Of the two variables, “change in perceived risk in prison” was the strongest predictor of an inmate’s change in perceived risk on the street ($= .47$).

Predicting Change Between Groups: Overall Perceived Risk

Three variables, “change in behavioral intentions,” “sex,” and “years of education,” were significantly correlated with “change in overall perceived risk.” Eleven percent (11%) of the variation in “change in overall perceived risk” is explained by these three variables ($R^2 = .11$).

“Change in behavioral intentions” was inversely related to “change in overall perceived risk.” Behavioral intentions were measured on a 10cm magnitude estimation scale, with 0 indicating intentions to engage in safer behaviors and 10 indicating intentions to engage in more risky behaviors. As amount of change in behavioral intentions increased, amount of change in overall perceived risk decreased. Inmates, then, who reported more of a change in their behavioral intentions reported less of a change in their overall perceptions of risk, and male inmates were more likely than females to change their overall perceptions of risk. Further, inmates with more years of education were more likely to change their overall perceptions of risk. Of the three, “change in behavioral intentions” ($= .21$) is the strongest predictor of “change in overall perceived risk.”

Predicting Change Among the Men

As indicated earlier, the men’s perceptions of risk on the street and their overall perceptions significantly decreased between the pre-test and the post-test (although the testing process may have contributed to this change). Two regression equations explored the relationship between the following independent variables that were significantly correlated ($p < .05$) with these dependent change variables among the men: (1) “change in perceived risk in prison”; (2) “change in knowledge of drug-related prevention”; (3) “change in behavioral intentions”; and (4) “years of education.”

Perceived Risk on the Street

Twenty-six percent of the variation in “change in perceived risk on the street” is explained by three independent variables ($R^2 = .26$). Two of these (“change in knowledge of drug-related prevention” and “years of education”) have confidence intervals constructed around the slopes which contain zero. This indicates that the true population slope could be zero, in which case there would be no change in the dependent variable for any change in the independent variable. The only variable that probably does not have a slope of zero is “change in perceived risk in prison.”

Men who experienced more of a change in their perceptions of risk in prison also experienced more of a change in their perceptions of risk on the street. Moreover, this variable was the most powerful predictor of change on the street ($= .41$).

Overall Perceived Risk

This equation explained only 13% of the variation in “change in overall perceived risk” ($R^2 = .13$). “Change in behavioral intentions” is inversely related to “change in overall perceived risk”; men who experienced more of a change in their behavioral intentions had less of a change in their overall perceptions of risk. Also, those men with more years of education experienced more change to their overall perceptions of risk following the AIDS education program. Of the two, “education” was the most powerful predictor of “change in overall perceived risk” ($= .27$).

DISCUSSION

“Overall perceptions of risk” were comprised of “perceived risk on the street” and “perceived risk in prison.” Both the men and the women perceived themselves to be more at risk on the street, probably because the street environment affords increased opportunities to engage in risky behaviors. The pre-test levels of perceived risk were the same for both groups; the men and the women saw themselves with the same levels of risk before the program. Afterward, however, is a different story. The men’s perceived risk decreased significantly, whereas the women’s remained at the same level.

These changes, however, may not have been the result of the education program. Significant differences were found between men in the experimental group and men in the comparison group, which suggests that factors other than the education program impacted perceptions of risk. Thus, changes could be attributed to time within the prison environment, by history of past risk behaviors, by the actual testing process, and perhaps, to a lesser extent, by the program.

During the month between the pre- and post-test, the men may have realized that their risk behaviors on the street did not warrant as much concern as they had previously believed. This state prison’s HIV/AIDS education program verified this belief for them—it emphasized that the virus is transmitted through “homosexual” intercourse, IDU, and perinatal transmission. Most of the men had not engaged in IDU on the street or in prison. Only 15% of the sample admitted to IDU on the street, 9% admitted to sharing needles on the street, and 7% reported that they had

engaged in sex with an IDU (none of them admitted to IDU within prison). Most of the men surveyed probably did not have “homosexual” intercourse (at least outside of the prison environment), and they obviously were not at risk perinatally. As a result, they became aware that their behaviors were not as risky as they had previously believed, and their perceptions of risk decreased. Heterosexual men who do not use IV drugs are at very little risk of infection (CDC, 1994), even when they have sex with infected women (Padian, Shiboski, & Jewell, 1991).

The women’s slight increases in perceived risk in prison and overall perceived risk also could be explained by their becoming more aware of the prison environment during the time between observations and by realizing that their own past behaviors put them at increased risk. Nearly one-third (32%) of the women reported IDU on the street and having sex with an IDU. Moreover, 22% of them reported sharing needles on the street. While none of the men admitted to IDU within the prison, 5% of the women said they had done so. Finally, 39% of the women reported having sold sex for money or drugs.

In fact, while both the men and the women report engaging in risky behaviors on the street, the women seem to participate in a wider variety of risky acts. When combining all the possible past risk behaviors (IDU on the street, IDU in prison, sharing needles, having sex with an IDU, and selling sex for money or drugs) into an index, it is apparent that more of the women practice more of the risky behaviors. While a majority of the men (84%) had not engaged in a single risk behavior, a majority of the women (55%) had engaged in at least one, with 25% of them engaging in three or more. The women in this study apparently feel more at risk for good reason.

Additionally, during the months at the diagnostic center, the women realize that lesbian sex occurs (they receive no information that this is not a likely mode of transmission), that their cellmates have menstrual cycles and bleed on bedclothes and toilet seats (they receive no information that this is not a likely mode of transmission), and that much sharing of plates, glasses, and cigarettes occurs. They become concerned about their risk of infection, perhaps realizing that many of their cellmates are current or prior IDUs and/or that they may be HIV-positive. This increased awareness (not the result of any program) may lead to increased perceptions of risk in the prison environment.

There was a significant difference between the men and the women in magnitude of change after the program on overall perceptions of risk, pre-dominantly because of the difference in change of perceived risk on the street. There are

several possible explanations for this finding. Obviously, the men felt less at risk following the program and the women did not. Again, it could have been a function of material that was (and/or was not) presented in the program. All of the material was aimed at men. The video was created by men for male inmates, portrayed male “experts” and inmates, and discussed HIV infection in terms of male epidemiology and symptomology. The women could have felt that their concerns were not being addressed, which may have contributed to feeling more at risk in the prison setting.

Further, a certain sense of paranoia seemed to permeate the sessions with the women. Before and after the sessions, they would share experiences with HIV-positive women, voice erroneous information about how the virus is transmitted, and give credence to popular misconceptions about prevention. This was especially troublesome in the women’s prison, because the women could have been in prison for up to three months before completing the post-test (because fewer women came into the prison each month, they were “collected” and their program was delayed until a satisfactory number of them could go through the program and be surveyed). All of them had been in for at least one month. Because the women were in the prison setting longer than the men (who completed the pre-test the day they arrived, and then post-tested exactly one month later), there was more opportunity for them to be exposed to myths, misperceptions, and innuendo fueled by women who had been in longer and who had plenty of time to speculate about the risks involved in their environment. It also appeared that those who had been in longer received some sort of perverse pleasure (and perhaps some elevated status) from frightening the “new kids on the block” with stories of rampant HIV-infection, tuberculin outbreaks, quarantines, and inadequate health-care.

The regression equations indicate that change in behavioral intentions, the variable with the greatest predictive power, was inversely related to change in overall perceptions of risk; more change in behavioral intentions was related to less change in overall perceptions of risk. Additionally, male respondents reported more change in their perceptions of risk, as did respondents with more years of education.

Two of these findings were logical and expected. Since the men experienced significant change from pre-test to post-test in overall perceptions of risk, it follows that being male would be associated with changes in perceptions of risk. As previously mentioned, the AIDS education program was constructed for male audiences and addressed transmission of HIV among male inmates. Women are likely to perceive risk from sex with their male partners, who may be IDUs, and

from their own IDU. Transmission and acquisition of HIV is not mentioned for women; therefore, issues related to their perceived risk remain unaddressed in this state's program.

Other studies also have found education to be related to perceived risk (Corby, Wolitski, Thornton-Johnson & Tanner, 1991; Feucht, Stephens & Gibbs, 1991; Peruga & Rivo, 1992). Data from this study indicate that the more educated the person, the more likely that his or her perceptions of risk changed. Level of education is strongly correlated with intelligence (Sternberg, 1982) and/or motivation (Petri, 1986) factors, which may have increased the likelihood that someone would respond to any sort of educational message contained within the program.

The third, and strongest, predictor of change in perceived risk was change in behavioral intentions. According to this finding, which is puzzling and difficult to interpret, inmates who reported more change in their behavioral intentions (and there were no significant changes in this area) reported less change in perceived risk. This implies that changes in intentions (presumably toward safer intentions) were not accompanied by changes in perceived risk. Thus, inmates who revised their intentions after the program, to reflect participation in safer behaviors, did not adjust their perceptions of risk accordingly. These men and women, then, thought themselves to have the same risk, even if they engaged in less risky behaviors.

This may reflect a fatalistic attitude about HIV infection, noted in previous studies (Corby et al., 1993; Davis-Berman & Brown, 1990). Hepworth and Shernoff (1989, p. 56) say that to change behavior and alter perceptions of risk "people must recognize that AIDS can be a direct threat to them" and that "AIDS is preventable and they can act to protect themselves and their sexual partners from infection," which "requires a specific understanding of transmission and prevention techniques."

According to data from this study, the inmates probably recognize that AIDS is a direct threat to them. Inmates generally have adequate general knowledge of HIV/AIDS infection (Keeton & Swanson, 1998; West, 1996; Zimmerman et al., 1991). In fact, they probably perceive themselves to be at higher risk than they actually are because they believe themselves to be at risk from activities that are unlikely routes of transmission (Keeton & Swanson, 1998; West, 1996; Zimmerman et al., 1991). However, they are at increased risk upon release because they do not know how to prevent the sexual and drug-related transmission and acquisition of HIV infection (Keeton & Swanson, 1998; West, 1996; Zimmerman et al., 1991). They have no "specific understanding of transmission and prevention techniques."

Logically, people should feel at greater risk when they participate in risky behaviors and should feel less at risk when they stop (or decrease) participation. These inmates did not feel very much at risk, even when they behaved in risky ways. Other research has also demonstrated a distinct lack of correlation between participation in risky behaviors and perceptions of risk (Brewer, Marquart, Mullings, & Crouch, 1998; Nyamanthi, Bennett, Leake, Lewis & Flaskerud, 1993; Tewksbury et al., 1998; Zimmerman et al., 1991). In fact, debate has raged for years as to the extent of correlation between cognition (i.e., knowledge, attitudes, beliefs, perceptions) and actual behavior (see Amaro, 1995, for a review of the psychological models used as bases for prison-based education programs).

Stasson and Fishbein (1990), for example, claim that the relationship between perceived risk and behavior change is mediated by the situation. They argue that perceived risk has nothing to do with intention and that normative pressures (the degree to which we perceive others want us to change our behaviors) have the greatest impact on behavior change. Instead of focusing on a message of “you are at risk,” prison programs should consider messages of the benefits of reducing risks, reducing the costs associated with reducing risks, and the normative systems involved. Davis-Berman and Brown (1990), moreover, claim that “high risk status may not encourage risk reduction, but rather, may promote a fatalistic attitude” (p. 10).

CONCLUSIONS AND RECOMMENDATIONS

Despite actual behavior, perceptions of risk can be “accurate,” “too high,” or “too low.” Individuals who “accurately” perceive their risk are those who realize their behaviors directly affect their likelihood of acquiring HIV. Individuals whose perceived risk is “too high” are those whose behaviors are less risky (i.e., they refrain from risky behaviors and/or they take necessary precautions for prevention), yet they still feel themselves to be at high risk. Those whose perceived risk is “too low” are those whose behaviors are more risky (i.e., they have high rates of participation in risky behaviors and/or they fail to take necessary precautions for prevention), yet they believe themselves to have little risk of infection. Those who have “too high” or “too low” perceived risk pose potential problems for correctional management and for general public health. Inmates whose perceived risk is “too high” may promote fear among the correctional population which would quickly become a serious management problem. Conversely, inmates whose perceived risk is “too low” might not take necessary precautions to protect them-

selves and others from infection, contributing to its spread among the prison population and among the general public upon their release.

Although this project measured perceived levels of risk, it can make no claims about whether inmate levels were “accurate,” “too high,” or “too low.” To determine how accurate individuals are at predicting their likelihood of HIV infection would require a longitudinal serological and behavioral study to correlate perceived risk, actual participation in risk behaviors, and HIV infection status. Therefore, this study cannot conclude whether levels should have increased, decreased, or remained the same; it can only report whether they did increase, decrease, or remain the same.

The *assumption* is usually that inmates overestimate their risk of infection (i.e., have “too high” perceived risk levels), so education programs should work to reduce fear, bringing perceptions more in line with inmates’ actual likelihoods of HIV infection. The problem with this reasoning is that prison programs do not routinely assess and correlate perceived risk with actual risk behaviors, so they have no guide for whether inmates need higher or lower perceptions of risk. For example, the male inmates could have been accurate in their assessment of risk before the program, in which case any change would have been undesirable. The female inmates could have been underestimating their risk before the program, in which case a decrease would have been undesirable.

Regardless of the direction of change (increase or decrease), it is clear that this state’s program had little overall impact on perceived risk of infection, especially among the women. This state’s program presents male narrators discussing HIV infection among males, by using males as examples, and by presenting epidemiology and symptomology related to infection among males. The male inmates surveyed for this project may have benefitted from some aspect of the program. However, the part of the men’s fear left unaddressed, fear of infection while incarcerated (albeit relatively low), is the most problematic for correctional administrators. Martin and Zimmerman (1990, p. 336) warn of potential ramifications when they state that “it (misinformation) may be especially destructive in an institutional setting, where unfounded fears can exacerbate endemic management problems.” Fearful inmates, those who perceive themselves to be at risk of HIV-infection, are those most likely to fear and mistrust those they suspect of having HIV disease.

It is extremely important that individuals be able to accurately assess their likelihood of HIV infection based on their prior and current levels of participation

in certain well-documented risk behaviors (e.g., IDU, sex with an IDU, sharing IDU equipment) and on their prior and current efforts at prevention. Unfortunately, it might be unrealistic to expect our correctional institutions to be able to evoke this type of awareness with prison-based HIV/AIDS education programs. Prisons cannot address the complex relationships among HIV infection, participation in risk behaviors, perceptions of risk, and behavioral intentions. The impact of sex and level of education is also difficult to mitigate within the correctional environment.

At a minimum, however, correctional facilities can inform inmates of prevalence rates associated with certain sets of risk behaviors, methods of prevention/risk reduction, and general knowledge of HIV acquisition, transmission, and symptomology (see also Keeton & Swanson, 1998). Ideally, these informational sessions would be supplemented with training programs to help inmates learn how to effect changes in their lives (if change is warranted). Knowledge without the tools to implement it is fairly useless, and these tools should vary based on characteristics, such as race/ethnicity and sex. This implies that cultural- and sex-sensitive AIDS education focused on preventing participation in risky behaviors should begin early in the educational setting (i.e., in our elementary schools). Further, more attention should be focused on street-based initiatives to reach individuals who have already started risk behaviors, but who have not yet had contact with the criminal justice system.

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