Levels and Predictors of HIV Risk Behavior Among Women in Low-Income Public Housing Developments

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SYNOPSIS

THE PREVALENCE OF increases in human immunodeficiency virus infection and illness rates among urban disadvantaged women underscore the urgent need for acquired immunodeficiency syndrome prevention interventions for high-risk women.

Few studies, however, have examined the factors contributing to risk in this population or predictors of risk taking and risk reduction.

A total of 148 women, most of them of racial minorities, living in low-income public housing developments completed measures designed to assess risk for human immunodeficiency virus infection and to analyze factors related to risk taking, including knowledge about acquired immunodeficiency syndrome, behavior change self-efficacy, intention to use condoms, and social norm perception about safer sex practices. History of sexually transmitted diseases, low rates of condom use, and relationships with men who were injection drug users or who were not sexually exclusive were commonly reported.

Women were divided into high- or low-risk categories based on behavior during the two preceding months. Women at low risk believed more strongly in personal efficacy of behavior change, were more committed to using condoms, and perceived risk reduction steps as more socially normative than high-risk women. Culturally tailored human immunodeficiency virus prevention interventions that address these dimensions are needed.

Although women have constituted only about 13 percent of acquired immunodeficiency syndrome (AIDS) cases diagnosed to date in the United States (*1*), the disease already has become the fifth leading cause of death among American women ages 18 to 44 (*2*) and is a leading cause of death in African American women in some regions of the United States (*3*).

Sharp rises in the incidence of human immunodeficiency virus (HIV) infection, which causes AIDS, among disenfranchised urban women are especially pronounced among those seen in sexually transmitted disease (STD) clinics (*4,5*) and in reproductive health, family planning, and acute medical care facilities that serve the poor (*6*). There has also been a steady rise in the proportion of HIV infections in women attributable to sexual contact rather than

injection drug use (*7*). Taken together, these data portend a continued steady rise in rates of sexually transmitted HIV disease among these women.

A number of studies examining factors influencing HIV risk behavior patterns among gay or bisexual men have established that safer sex social norm perception, perceived vulnerability, self-efficacy, and attitudes toward condoms are important predictors of risk (*8-11*).

There are only a few studies that have examined the risk behaviors of disadvantaged women (*12-14*). Jemmott and Jemmott *(12)* found that condom use among urban African American college students was related to favorable attitudes toward condoms and reference group approval of condoms. Nyamathi and coworkers (*13*) established that with elevated rates of HIV risk behavior among impoverished minority women, the level of risk is predicted by ethnicity, acculturation, and substance use. Interestingly, risk level is also related to high perceived risk and high level of knowledge about AIDS. Other surveys, such as Catania's San Francisco study (*14*), have established sexual communication skills and attitudes toward condoms as important influences on risk behavior among ethnically diverse urban women.

We anticipated that high levels of risk behavior would be associated with perceptions that condom use is not an accepted peer norm and with weak beliefs that risk reduction behavior change can be personally effected.

A number of researchers have pointed out, however, that risk for sexually transmitted HIV infection among low-income women is also linked to imbalances of power in their relationships with men, cultural factors that discourage female-initiated discussions about sex, the presence of competing and more urgent life stressors related to disadvantage, and an absence of female-controlled barrier protection methods (*15-18*).

Of the approximately 4.5 million Americans who live in subsidized public housing, a majority are low-income unmarried women with children (*19*). Although social problems such as crime, gang activity, violence, and drug use in these projects have been extensively described (*20-21*), we are unaware of any studies examining levels and predictors of HIV infection risk among women in these community settings.

The objective of our study was to identify the prevalence and nature of HIV risk behaviors among low-income women living in public housing and to identify predictors of risk level among them. Based on the reasoned action (*22*) and cognitive-social learning (*23-24*) models of behavioral prediction, we anticipated that high levels of risk behavior would be associated with perceptions that condom use is not an accepted peer norm and with weak beliefs that risk reduction behavior change can be personally effected. Because public housing projects are logical community settings in which to conduct HIV-AIDS prevention programs, we also sought to identify issues that would facilitate the development of prevention programs for women who live in these settings.

Method

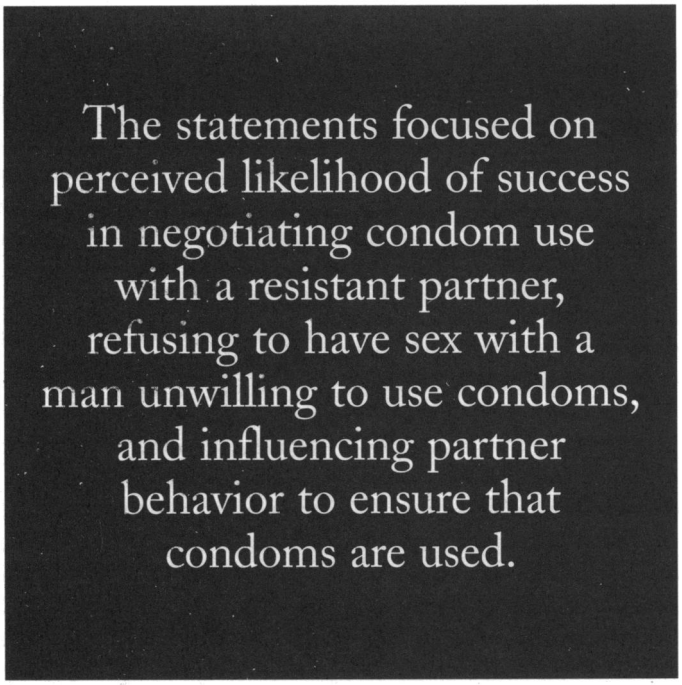
Participants. Participants in the study were 60 women living in low-income housing developments in Cleveland, OH, 39 in Seattle, WA, and 49 in Roanoke, VA. These cities were chosen because they are typical of middle-sized American cities now experiencing an increase in HIV infections and other STDs among women, according to local prevalence studies. Surveys were conducted in one public housing development identified as ethnically and demographically representative of others in the central urban area of each city. The urban core areas were characterized by socioeconomic disadvantage and poverty, high incidences of sexually transmitted diseases, teen pregnancy, drug abuse, and school dropouts, and an increasing risk of contracting HIV infection.

The mean age of women in the sample was 31.1 years with a standard deviation (SD) of 8.8; range 16-64 and most were ethnic minority women—78 percent African American, 2 percent Hispanic, and 8 percent other ethnicities. The mean education level was 11.5 years (SD = 1.5; range 6–16). Most of the women were unemployed (82 percent), with 94 percent reporting a household income of less than $11,000 per year. Slightly less than half of the women reported being in a long-term relationship with one man. Eighty-nine percent had children (mean = 2.7 children). Women in each of the three cities were of similar age, relationship and income status, and had similar numbers of children. The participants did differ between cities on racial characteristics. In Cleveland, 97 percent were primarily African American women; in Roanoke, 94 percent. Of the women in Seattle, 70 percent were white or "other" ethnicities. There were no differences in rates of risk behavior across the samples obtained in each of the three cities, so

they were consolidated for all analyses.

Procedure. Data in this study were collected during a one-week period in November 1992. Women were informed of the study through announcements posted in housing developments, or they were approached directly by research project staff members in central areas of each housing development. Those interested were asked to complete a questionnaire assessing their knowledge, beliefs, and behavior related to AIDS and were offered a small incentive payment for their participation. More than 90 percent of the women approached agreed to complete the assessment. To maintain confidentiality and promote candor, women completed the questionnaires privately and anonymously. Although the questionnaires were constructed to be easily comprehensible and to employ vernacular understood by persons with limited reading ability, a staff assistant was available to answer questions or read the questionnaire to participants if they had difficulty.

Measure. The content of the questionnaire was adapted from previous work conducted by the investigators on factors influencing HIV risk (*9,25*). The questionnaire requested demographic information (age, race, education level, employment status and income level, relationship status, and number of children). It also was used to determine sexual practices, history of sexually transmitted disease, HIV testing history, injection drug use, knowledge of AIDS risk, beliefs regarding risk reduction efficacy, intentions with regard to condom use, perceived peer norms concerning condom use, and interest in attending AIDS education programs.



Sexual practices. Each woman reported the number of men with whom she had sex in the previous two months, in the previous 12 months, and in her lifetime. Participants reported the frequency of condom-protected and unprotected sexual intercourse for the previous two months. They also noted whether they had had sexual intercourse during the preceding two months and the preceding 12 months with any high-risk male partners, defined as men who were injection drug users or who were having sex concurrently with other women or men. In addition, the questionnaire asked if they definitely knew their partners were using injection drugs or having sex with other people, definitely knew their partners were not doing these things, or did not know for certain about their partners' current risk behavior. We also asked each participant whether a condom was used on her last occasion of sexual intercourse.

STD history, HIV testing history, and injection drug use. Participants were asked to report whether they had ever had a sexually transmitted disease, and if so, when the STD had occurred, whether they had been tested for HIV, and if they had injected drugs at any time in the previous 12 months.

AIDS risk knowledge. Fifteen of the questionnaire items assessed practical knowledge about AIDS, addressing modes of transmission, HIV risk, risk reduction, and common misconceptions. Participants answered true, false, or don't know for each item.

Risk reduction efficacy and condom use intentions. Participants were asked to respond to seven statements designed to elicit their confidence level in personally implementing risk reduction behavior change and their intention to use condoms at the next occasion of sexual intercourse (table 3). The statements focused on perceived likelihood of success in negotiating condom use with a resistant partner, refusing to have sex with a man unwilling to use condoms, and influencing partner behavior to ensure that condoms are used. The women's response to each statement was matched against a five-point Likert scale that ranged from "strongly disagree" to "strongly agree." To control for acquiescent response sets, items were worded so a strong agreement rating meant high efficacy or intentions for some statements and low efficacy or intentions for others.

Perceived peer norms. The questionnaire presented five statements related to beliefs about peers' acceptance and use of condoms (table 4). These statements assessed the women's perceptions about condom use acceptance by women and men in her social reference group and their perceptions of whether men can usually coerce women into having unwanted sex. Norm perception was assessed for each statement with a five-point Likert scale ranging from "strongly disagree" to "strongly agree" with some items reverse-scored to control for acquiescent response set.

Table 1. Percentage of women reporting high-risk sexual behaviors in three-city survey of public housing community residents, 1992

Type of behavior	*Past 2 months*	*Past 12 months*
No condom use[1]	39	...
Consistent condom use[1]	19	...
Partner had sex with other women[2]	39	57
Partner had sex with other men[2]	14	16
Sex with a injecting drug user[2]	5	11
More than one partner	22	56

[1]Because it was unlikely persons could accurately recall all occurrences of sex and condom use over a one-year period, frequency of intercourse and condom use data were requested only for the past two- month period.

[2]Percentages shown include both women who said they had a high-risk partner and those who said their partner may have been high risk.

Table 2. Percentage of women correctly answering AIDS knowledge items in three-city survey of public housing residents, 1992

Item	*Percentage correct*
Most people who have the AIDS virus look sick	70
Most people who get the AIDS virus are sick within a few weeks	69
Men can give the AIDS virus to women	88
Women can give the AIDS virus to men	90
A person can get the AIDS virus from sharing kitchens and bathrooms with a person who has AIDS	87
Birth control pills protect against the AIDS virus	91
A person must have many sex partners to get the AIDS virus	80
Bathing after sex provides no protection against the AIDS virus	59
Latex and natural skin condoms protect the same against the AIDS virus	39
You can usually tell if somone has the AIDS virus by looking at them	84
Men who inject drugs often have the AIDS virus	46
Women who inject drugs often have the AIDS virus.	46
You can get the AIDS virus by having sex once with an infected partner	82
Most people who have the AIDS virus know it	67
You can get the AIDS virus by being sneezed or coughed on	81

Interest in AIDS education program. The women were asked whether they would attend an AIDS education program if one were offered at the housing development.

Results

A total of 148 women completed the questionnaire. We analyzed results from the full sample to determine the overall level of high-risk sexual practices, other risk-related factors, and AIDS risk knowledge. We then grouped the women based on levels of sexual risk behavior to identify predictors of risk behaviors.

Sexual practices. Of the 148 women, 86 percent reported having had sex in the previous two months, with a mean of 1.7 (SD = 4.4) male partners in the previous two months and 4.3 (SD = 8.1) male partners in the previous year. Women reported a median of 8.0 and a mean of 20.7 (SD = 52.1) lifetime sexual partners, with 97 percent of the sample reporting multiple partners in their lifetime. As shown in table 1, 22 percent of the women had had more than one sexual partner in the preceding two months, and 56 percent had multiple partners in the preceding 12 months.

The mean number of unprotected sexual intercourse occasions reported for the previous two months was 7.4 (SD = 13.4). Condom use in the sample, based on sexual behavior during the preceding two months, was low. Thirty-nine percent of the women said they never used condoms for sexual intercourse, and only 19 percent reported consistent condom use in the two preceding months. In addition, 64 percent of the women reported not using a condom during their last intercourse.

As table 1 shows, a majority of women reported having sex with high-risk male partners. More than half (57 percent) of the women said they had had sex in the preceding 12 months with a man they knew or believed was concurrently having sex with other women, while 16 percent of the women reported having sex with a man they knew or believed was having sex with other men. Eleven percent of the women said they had had sex with a man they knew or felt was using injection drugs. Only 38 percent of the women in the sample were confident that none of their male partners over the preceding 12 months were at high risk for AIDS for any of these reasons.

STD history, HIV testing, and injection drug use. Among this sample of women living in low-income housing developments, 46 percent reported having had asexually transmitted disease in their lifetime, and 38 percent said they were treated for an STD within the preceding 12 months. Only 4 percent reported having used injection drugs in the previous year.

AIDS risk knowledge. As shown in table 2, the women in the sample were knowledgeable about certain aspects of HIV-AIDS risk but demonstrated limited understanding in other risk areas or held misconceptions that might lead to an incorrect underestimation of risk. For example, 30 percent of the women believed incorrectly that most people with HIV infection look sick, 31 percent thought that people who have HIV become sick within a few weeks, and 32 percent believed that most people with HIV know they

Table 3. Mean differences between high- and low-risk women in beliefs regarding personal risk reduction self-efficacy and behavior change intentions in three-city survey of public housing residents, 1992

Item[1]	High-risk (N=43)	Low-risk (N=48)	F-value	P≤
It is easy to talk to a man about using condoms	2.88	3.40	4.14	.04
The right man could talk me out of using condoms	2.02	0.90	15.14	.000
It is hard to say no to sex with a man you care about	2.72	2.15	3.33	.07
It is easy to say no to sex if a man won't use condoms	2.47	3.17	6.31	.01
If I have sex with a man, I can make him use a condom	2.58	3.44	13.64	.000
The next time I have sex, a condom will be used	3.02	3.75	11.59	.001
The next time I have sex, I won't use a condom unless my partner wants to	1.35	0.69	5.45	.02

[1]Five-point scale: 1 Strongly disagree to 5 Strongly agree.

have it. With respect to knowledge of AIDS risks, 41 percent incorrectly identified bathing after sex as an effective risk reduction strategy, 61 percent thought that natural skin condoms protect against HIV as well as latex condoms, and 54 percent did not know that persons who inject drugs are often HIV-infected.

Predictors of risk behavior. Women were assigned to high- and low-risk categories based on their levels of sexual risk behavior. Women assigned to the high-risk group (N = 44) were those who reported having had unprotected sex in the previous two months with men defined as short-term partners and those with long-term but known high-risk male partners. Women in the low-risk group (N = 50) were those who had had no unprotected sexual intercourse in the two previous months. They either did not have sexual intercourse or consistently used condoms. Respondents who reported having had only a single partner and were not using condoms were not included in the comparison unless the partner was known by the woman to be an IDU or to be involved in sexual relationships with others, or both, in which case they were assigned to the high-risk category.

Risk reduction efficacy and condom use intentions. A multivariate analysis of variance (MANOVA) indicated significant differences between the two groups on belief items related to risk reduction self-efficacy and behavior change intentions; Hotelling's T^2, (S = 1, M = 2 1/2, N = 40 1/2) = .389, $P < .001$. Univariate analysis showed significant differences for six of the seven items. As can be seen in table 3, women in the low-risk group were more committed than women in the high-risk group to using a condom the next time they had intercourse and had stronger intentions to insist on condom use regardless of their partner's resistance or reluctance. They also held consistently efficacious beliefs about their ability to refuse sex with men who would not agree to use condoms.

Perceived risk reduction peer norms. A second MANOVA indicated significant differences between the high- and low-risk groups on perceived peer norms concerning risk reduction, (Hotelling's T2, (S = 1, M = 1 1/2, n = 41) = .157, $P < .05$). Univariate analysis confirmed a significant difference between risk-level groups on the items "Men can usually talk a woman into having sex even if the women doesn't want to,"

Table 4. Mean difference between high- and low-risk women in perceived risk reduction peer norms in three-city survey of public housing residents, 1992

Item[1]	High-risk (N=41)	Low-risk (N=49)	F-Value	P<
Most people talk about condoms more than they really use them	3.61	3.43	1.01	.32
Condoms are completely accepted by most men I know.	1.88	2.30	2.06	.16
All women I know always insist on condom use	1.54	2.16	4.68	.03
Condom use is not yet well-accepted by my friends	2.32	2.20	0.16	.69
Men can usually talk a woman into having sex even if the woman doesn't want to	2.93	2.06	9.22	.003

[1]Five-point scale: 1 Strongly disagree to 5 Strongly agree.

$F(1, 88) = 9.22$, $P < .01$, and "All women I know always insist on condom use," $F(1, 88) = 4.68$, $P < .05$ (table 4).

STD history and HIV testing. High-risk women were significantly more likely than those in the low-risk group, c^2 $(1) = 8.24$, $P < .01$, to report having had an STD. No significant differences were found between high- and low-risk women in HIV testing history. Eighty women reported that they had been tested for HIV and learned their test result; one of these women said she was infected.

AIDS risk knowledge, age, and education. Analyses of variance were conducted on AIDS risk knowledge and related demographic information for the high- and low-risk groups. Women in the two groups did not differ significantly in scores on the AIDS risk knowledge measure or in age or level of education.

Women's interest in participating in AIDS prevention programs. Interest in participating in AIDS prevention and education programs was uniformly high; 95 percent of all women surveyed indicated that they would like to attend AIDS prevention programs and to learn more about AIDS.

The finding that about one-third of our respondents were at no risk based on their recent behavior... suggests that behavior change interventions hold promise even for highly disadvantaged women.

Discussion

Although reported HIV seroprevalence was low in our sample, a large proportion of adult women living in low-income public housing developments in the three cities were at risk for contracting HIV infection, chiefly because of relationships with multiple male sexual partners and with high-risk partners. Low rates of consistent condom use, high rates of STDs, and frequent sexual relationships with men who used injection drugs or were concurrently having sex with other partners underscore the magnitude of risk encountered by these women.

Consistent with the reports of others (*12,13*), basic AIDS risk knowledge was unrelated to women's risk levels. Although knowledge about AIDS was high in some areas—such as knowledge that risk can occur through heterosexual contact—a majority of women did not know that IDUs often have HIV infection or that latex condoms afford better protection than natural skin condoms, and many believed that most people with HIV infection know they have HIV and appear visibly ill. Such misconceptions may lead women to underestimate their personal risk and merit attention in prevention efforts.

Women at low risk differed from high-risk women in the strength of their intentions to use condoms at next intercourse, in beliefs about whether they could successfully resist a man's reluctance to use condoms, in perceptions of their ability to control condom use, and in perception of whether insistence on condom use was the position taken by female friends. Although the correlational methodology used in this study cannot determine causality, the findings are consistent with both reasoned action (*22*) and cognitive-social learning (*23,24*) conceptualizations that posit such belief, efficacy, and norm perception characteristics as important determinants of HIV risk behavior change.

The findings suggest that interventions to promote risk behavior change among low-income women should focus on strengthening behavior change intentions, provide skills training to increase feelings of change efficacy, and increase supports from important peer and social referents for change efforts. Group interventions that teach sexual communication and assertiveness skills, that help people identify benefits of behavior change, that look at barriers to change, and that provide social support for change efforts have proved useful in HIV prevention programs with other populations (*26-28*). Such efforts merit evaluation with community populations of economically disadvantaged women.

A major challenge will be to take into account the social, psychological, economic, and role relationship barriers that work against change among these women. Although these barriers are genuine and difficult, the finding that about one-third of our respondents were at no risk based on their recent behavior—and the association of this successful risk avoidance pattern with distinctive beliefs and norm perceptions—suggests that behavior change interventions hold promise even for highly disadvantaged women.

Some limitations of our study may have implications for behavior change intervention. First, additional data on type of partner, such as long-term, casual, or paying customers, could provide information for tailoring female-based interventions. Second, specific drugs used, such as crack cocaine, and their potential associations with sexual risk behavior warrant further examination to develop effective interventions for substance- using women. Last, although age was not related to women's level of risk, this sample was slightly older than the segment of younger women considered to be at significant risk for HIV infection. Intervention programs

targeted at younger women, specifically adolescents, must take into account developmental factors, such as perceived invulnerability, and current social norms.

These results highlight the relevance of public housing developments as important venues for HIV primary prevention interventions. Given that the women participating in this research were not identified using random probability sampling, larger-scale surveys will be needed to determine the generalizability of these findings to other public housing populations. Because low-income housing developments constitute identifiable communities with adult and adolescent members who are at high risk for contracting HIV infection, however, incorporation of HIV-AIDS prevention programs in the social service, health, and tenant management activities within public housing developments is urgently needed.

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