Published in final edited form as:

J Obstet Gynecol Neonatal Nurs. 1995 January ; 24(1): 33–39.

HIV Risk Status and Preventive Behaviors Among 17,619 Women

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Abstract

Objectives—To document the percentage of women at high risk for human immunodeficiency virus (HIV) infection among primary care clients, identify their most prevalent risk factors for HIV infection, and examine the relationships between risk status and preventive behaviors for HIV infection.

Design—Cross-sectional.

Setting—Urban and nonurban primary care clinics.

Participants—Female clients ($N = 17,619$) who voluntarily completed an HIV risk-assessment form.

Main outcome measures—HIV risk status, condom use, and previous HIV testing.

Results—Using criteria from the Centers for Disease Control, the study found 14% of the sample to be at high risk for HIV infection. Prevalent risk factors were having sex with persons at high risk for AIDS, having sex with more than six persons in a year, and having more than two sexually transmitted diseases. Women at high risk were more likely to be older, urban, and black. Overall, rates of consistent condom use and HIV testing were low, 12% and 7%, respectively. Older women, coupled women, and women of color were least likely to use condoms consistently. Women at low risk were less likely to have had HIV tests.

Conclusions—To prevent HIV infection, nursing interventions can target women of all ages, especially urban and black women. Nurses should use strategies and skills to promote condom use that are different from those they use to encourage HIV testing.

The numbers of women with acquired immunodeficiency syndrome (AIDS) has been increasing markedly. The most common sources of human immunodeficiency virus (HIV)

infection in women are intravenous drug use and heterosexual intercourse (Centers for Disease Control (CDC), 1993; Ellerbrock, Bush, Chamberland, & Oxtoby, 1991). Among women with AIDS, those whose infection resulted from heterosexual contact increased from 15% before 1984 to 36.25% as of June 1993 (CDC, 1989, 1993; Guinan & Hardy, 1987).

Little data have been available on HIV risk status and preventive behaviors for women in general and, in particular, for nonpregnant women (Anastos & Marte, 1989; Ickovics & Rodin, 1992). Researchers have focused on women as mothers, sexual partners, and as vectors of transmission of HIV, rather than on the health problems of women who have HIV infection (Anastos & Marte, 1989; National Women's Health Network, 1990). "Women who may have HIV infection or AIDS need to be regarded ... as individuals in their own right. ..." (Smeltzer & Whipple, 1991, p. 255).

Among mostly disadvantaged Latina and black women ($N = 1,308$) seeking contraception in the San Francisco area, 14% were at high risk for HIV infection (Darney, Myhra, Atkinson, & Meier, 1989). Among mostly disadvantaged black and Latina female adolescents ($N = 198$) seeking contraception in the Houston area, 9% were at high risk for HIV infection (McGill, Smith, & Johnson, 1989). Among mostly white clients ($N = 16,083$) receiving family planning through sliding-scale fees or subsidies in Pennsylvania, 5% were at high risk for HIV infection (Bowen et al., 1990). Definitions of high-risk status differed somewhat among these studies, but all definitions included intravenous drug use or having a sexual partner at risk (e.g., an intravenous drug user, a bisexual male, or a hemophiliac). These researchers documented the degree of risk of HIV among some women, but often they did not compare HIV risk status and preventive behaviors among subgroups defined by geographic setting of residence, age, and race.

The prevalence of AIDS differs by race and geographic setting of residence. AIDS is more common among black and Latina women than among white women. AIDS is most common in urban areas (i.e., large metropolitan areas of 1 million people) and in the northeast (Centers for Disease Control, 1990a, 1992; Ellerbrock et al., 1991). More research is needed on the prevalence of high-risk factors and preventive behaviors for HIV (e.g., following safe-sex practices and seeking HIV testing) by gender, geographic setting, age, and race (Brooks-Gunn, Boyer, & Hein, 1988; Selik, Castro, & Pappaioanou, 1988).

Identifying the risk status and preventive behaviors among particular populations is essential to guide preventive efforts (Allen & Curran, 1988; Centers for Disease Control, 1990b, 1990c). If nurses knew which subgroups of their clients were at high risk, they could target preventive efforts to them. If nurses knew what factors explained high-risk status, then they could tailor preventive efforts to reduce these risks.

This study (a) documented the percentage of women at risk for HIV infection in a large northeastern sample; (b) identified their most prevalent risk factors; (c) compared risk status, risk factors, and preventive behaviors (i.e., condom use and HIV testing) among subgroups defined by demographic characteristics; (d) examined relationships of preventive behaviors with risk status and demographic characteristics; and (e) described the relationship between

condom use and HIV testing overall and in subgroups defined by demographic characteristics.

Method

Design/Setting

With a cross-sectional design, this study was part of an AIDS prevention program for a large, northeastern metropolitan area that ranks 10th in the total number of patients with AIDS in the country (U.S. Department of Health and Human Services, 1992). Five sites in urban settings and two sites in nonurban settings (i.e., two cities, each with a population less than 35,000, in adjacent counties) were used. Urban sites included four hospital ambulatory clinics and one community health center; nonurban sites were two family-planning clinics. The geographic setting (urban versus nonurban) where participants were recruited was analyzed because it is an indicator of residence; residence in a metropolitan area of more than 500,000 population is associated with a higher incidence of AIDS (Center for Disease Control, 1989, 1990a). Data were collected from May 1, 1988 to April 30, 1989.

Sample

A convenience sample of 17,619 women seeking primary care services was obtained. Participants' visits involved contraception (81%), gynecology (7.8%), obstetrics (7.8%), other primary care (2.1%), and drug treatment (1%). Two thirds of participants (67%) were recruited from nonurban sites and one third from urban.

Participants' mean age was 23 years ($SD = 6.8$). Thirty-six percent were 11–19 years old, 35% were 20–24, and 29% were 24 and older. Among those 24 and older, approximately 24% were 25–34; 3.5% were 35–44; fewer than 2% were 45 or older. Participants were 52% white, 42% black, 5.4% Latina, and 1% of Asian or other origin. Most had a high school education (70%) and were not coupled (i.e., neither married nor living with a partner) (77%).

Age was associated positively with being coupled ($\phi = .31, p < 0.0001$). The ϕ statistic reveals the degree of relationship between categorical variables and is interpretable as a correlation coefficient (Cohen & Cohen, 1983; Fleiss, 1981). Nonurban clients were primarily white ($\phi = .75, p < 0.0001$) and younger than 20 years of age ($\phi = .23, p < 0.0001$); urban clients were more likely to be black. White and black clients were less likely to be coupled than Latina or other women ($\phi = .16; p < 0.0001$).

Fifty percent of women clients at the sites of the study participated. Based on data from 1989, 31% of the clinic population were 19 years of age or younger, 36% were 20–24 years of age, and 33% were 24 years of age and older. The population was 49% white, 45% black, 4% Latino, and 2% of other origin. The participants were similar in age and race to the clinic population. Socioeconomic data were not obtained for participants, but 77% of the women clients had annual family incomes below 150% of federal poverty levels in 1989.

Procedure

Participants voluntarily completed an HIV risk-assessment form after giving verbal consent during a clinic visit. Confidentiality was protected by not using names on forms. The self-

report form was reviewed with clients by clinic staff who had in-service education about AIDS, risk reduction, and the form. AIDS education was offered, and women at high risk were referred for HIV tests.

Instrument

A one-page risk-assessment form assessed risk factors, preventive behaviors, and demographic data. Twenty-eight short-answer questions were designed by clinicians and researchers who had expertise in AIDS prevention and questionnaire construction. The form was refined after pilot testing.

Responses to self- and staff-administered versions of HIV risk-assessment forms have been compared. Responses to HIV risk behaviors were consistent with the two methods of administration (Aral, Magder, & Bowen, 1989; Bowen et al., 1990). These findings support the reliability of self-reported data (i.e., consistency) across methods of administration and the assumption that participants understood the self-administered form. However, the degree to which participants may underreport risky behaviors is not known.

High-, moderate-, and low-risk factor criteria were defined by the consulting staff at the Centers for Disease Control (personal communication, Paul Feorino and Peter Drotman), the state health department, and related literature. These definitions may be debated, but degrees of risk exist and have clinical implications. High- and moderate-risk factors are listed in Tables 1 and 2. The high-risk factors are similar to but more inclusive than some used in past research (e.g., having more than two sexually transmitted diseases (STDs) in the past 5 years, having more than six partners per year since 1978, having hemophilia). Low-risk factors included no history of STDs, 0–1 low-risk partner per year since 1978, and no other risk factors.

A primary prevention behavior, condom use, was measured by asking, “In the past 6 months, when you have sex, how often do you and your partner(s) use condoms (rubbers)?” Responses were *always*, *sometimes*, *never*, or *had not had sex*. Clients’ recent behavior was considered most relevant as a guide for prevention efforts.

Having undergone previous HIV testing was measured because seeking early diagnosis is a secondary prevention behavior. Participants were asked, “Have you ever had a test for the AIDS virus?”

Results

Risk Status and Prevalent Risk Factors

High-risk status was defined as an affirmative response to any high-risk factor item. Overall, 13.6% of participants ($n = 2400$) were classified as at high risk. Most women at high risk (77%) had only one risk factor; 15% had two risk factors. Among those at high risk, 38% had had more than two STDs in the past 5 years, 35% had had sex with an intravenous drug user, and 23% had more than six sexual partners in any 1 year since 1978 (see Table 1).

Absence of a high-risk factor and presence of one moderate-risk factor determined moderate-risk status. Overall, 44.1% of participants ($n = 7,762$) were at moderate risk. Most (79%) of those at moderate risk had only one risk factor; 19% had two. Among those at moderate risk, 85% had between two and five sexual partners in any 1 year since 1978, and 29% had one STD in the past 5 years (see Table 2).

The absence of either a high- or a moderate-risk factor determined low-risk status. Overall, 42.3% of participants ($n = 7,457$) were at low risk.

An alpha of 0.001 was chosen for this study. The large sample made it easy, but perhaps not clinically meaningful, to find relationships that were significant at the 0.05 level. The alpha of 0.001 reduced the probability of detecting small relationships that could be clinically unimportant.

Risk Status by Demographic Characteristics

A logistic regression was run to determine the relative influence of setting, age, and race on risk status (high risk versus not high risk). Logistic regression is an appropriate analysis with multiple predictors and a dichotomous, dependent variable (Aldrich & Nelson, 1984; Cleary & Angel, 1984). Risk status was regressed simultaneously on age (a continuous variable), setting (urban versus nonurban), and race. Race was represented by two dummy-coded variables, race 1 (black = 1, not black = 0) and race 2 (Latina = 1, not Latina = 0); whites were the referent group (coded 0 on both race 1 and race 2). Age and setting were significant predictors ($p < 0.001$). Older women and clients at urban settings had greater odds of being at risk (see Table 3, model 1).

In addition, risk status was regressed only on age and race. Race and setting were associated strongly; race is an important factor in targeting groups for prevention. Both age and race were significant predictors. Older women and black women had greater odds of being at risk (see Table 3, model 2).

Examining High-Risk Factors by Demographic Characteristics

High-risk factors were examined by age. Having a history of sex with an intravenous drug user or with a bisexual male was about four times higher among those 25 years of age or older than among those 19 or younger (8.3% versus 2.1%, $\phi = .12$, $p < 0.0001$; .2% versus 1.8%, $\phi = .10$, $p < 0.0001$, respectively). Having had more than two STDs in the past 5 years was more common among those 25 and older than among those 19 or younger (6.3% versus 3.6%, $\phi = .13$, $p < 0.0001$).

When high-risk factors were examined by racial groups, blacks were more likely to have had more than two STDs than whites or Latinas (11.3% versus 1.9% or 3.3%, $\phi = .29$, $p < 0.0001$). Whites and blacks were more likely to have had more than six sexual partners in a year than were Latinas (3.5% and 2.5% versus 1.6%, $\phi = .10$, $p < 0.0001$).

When high-risk factors were examined by setting, urban clients were more likely to have had more than two STDs in the last 5 years than nonurban clients (10.8% versus 2.4%, $\phi = .26$,

$p < 0.0001$). Also, those coupled were less likely to use condoms than those not coupled (67% versus 47%, $\phi = .18$, $p < 0.001$).

Relationship of Preventive Behaviors With Risk Status and Demographic Characteristics

Most participants (52%) had not used condoms in the past 6 months; 31% used them sometimes, and 12% always used them. A multivariate logistic regression was run to explain condom use (always versus not always). Explanatory variables entered were age (a continuous variable), two dummy-coded variables for race, race 1 (black = 1, not black = 0) and race 2 (Latina = 1, non-Latina = 0); risk status (high risk versus not high risk), and couple status (single = 1, couple = 0). Couple status was included because of its relevance to condom use, whereas setting was excluded because it was not deemed relevant. Older women, coupled women, and women of color were less likely to use condoms consistently (see Table 4). Risk status did not predict condom use significantly.

Most participants (93%) had not undergone HIV testing. A logistic regression was run to explain prior HIV testing (had versus not had); explanatory variables were age, race, couple status, and risk status. Women at low risk were less likely to have sought HIV testing (see Table 5).

Relationship of Condom Use and HIV Testing

Overall, the relationship of prior HIV-testing (had versus not had) with level of condom use was not significant ($\phi = 0.01$, $p > 0.01$). When those not tested were compared to those tested, it was found that 12% versus 15% always used condoms, 31% versus 31% sometimes used condoms, and 52% versus 49% never used condoms in the last 6 months. Half of the respondents (52%) who had not sought testing also had not used condoms in the last 6 months.

The relationship of condom use and HIV testing was not strong within age or race groups. Examination of this relationship by setting revealed only a small relationship ($\phi = 0.06$, $p < 0.001$). Among urban women who had not been tested, 7.7% reported always using condoms; among those who had been tested, 12.8% always used condoms.

Discussion

This study adds to the previous research by comparing women's prevalent high-risk factors and preventive behaviors for HIV across setting, age, and racial groups. Also, it involves a large, ethnically mixed sample of primarily nonpregnant women.

Consistent with past research, the prevalence of high-risk factors for HIV was 14%, and urban and black women were at high risk (Darney et al., 1989; Hayes, Sharp, & Miner, 1989; McGill et al., 1989; Selik et al., 1988). The prevalence of risk factors in this sample is higher than that reported for a sample of Planned Parenthood clients (Bowen et al., 1990). The prior sample differed from the present because it was comprised of more white, high-school educated, and somewhat younger women.

Finding that risk for HIV infection was greater and that condom use was lower among women 20 years of age or older may be explained by saying that women experience more risky situations as they get older. Differences in condom use by age may be explained by the fact that women under 20 years of age are more likely to use condoms for birth control, and they are less likely to be coupled than older women. Women who are coupled are less likely to use condoms than those not coupled.

Consistent with past research, women were at high risk for HIV infection because of having sex with an intravenous drug user (Corby, Wolitski, Thornton-Johnson, & Tanner, 1991; Harrison et al., 1991). Nursing interventions should offer specific information on safer sex practices and on cleaning injectable drug paraphernalia.

The finding that many women were at high risk for HIV infection because they had sex with men at high risk calls for nursing interventions to promote preventive behaviors, such as using condoms, other barrier contraceptives, and spermicides (Nelson, 1991). Consistent with past research, condoms were not used consistently (Centers for Disease Control, 1990d; Harrison et al., 1991; Valdiserri, Arena, Proctor, & Bonati, 1989). Nursing interventions to promote condom use can emphasize the perceived efficacy of condoms for HIV prevention (Hardy, 1989; McGill et al., 1989) and can address positive attitudes toward condoms in mixed-sex groups (Kegeles, Adler, & Irwin, 1988).

Based on these findings, interventions could address the higher risk status for HIV infection and other STDs among urban black women. However, STD prevention and appropriate HIV testing could be addressed with all young women, focusing on preserving health and fertility. Condom use could be addressed with Latina and older women, recognizing their lower rates of birth control use and higher rates of coupling.

Consistent with other research, condom use and HIV testing were not associated, and they were not explained by the same variables in multivariate analyses (Krick & Sobal, 1990; Langlie, 1979). Preventive behaviors for HIV—condom use, cleaning injectable drug paraphernalia, and HIV testing—involve different skills and social contexts. Thus, different nursing interventions are needed to promote these various behaviors. On an optimistic note, women under 19 years of age were more likely than older women to use condoms consistently, even if they had only one partner. Women at high risk for HIV were more likely to have sought HIV testing than those who were not, both within this sample and others (Corby et al., 1991).

These findings are most applicable to urban and non-urban areas with white, black, and Latina populations. Also, this sample was identified through primary care clinics and is not necessarily representative of the general population. The 50% participation rate is explained by the nature of the settings, which were busy clinical sites. When clinical issues were pressing, there was limited time for staff to invite participation and for clients to participate. The degree of nonparticipation because of refusals by women who were at high risk is not known.

In future research, risk factors could be redefined as AIDS-related research evolves. For example, the high-risk criterion of more than six partners in any year since 1978 should be

revised. Some women could have had four partners a year for several years, exposing themselves to more risk than women who had six partners in 1 year and one partner subsequently. To assess changes in risk behaviors resulting from increased age or preventive interventions, data would be obtained at two points in time rather than at one. To maximize HIV prevention, nurses can address STD prevention among women of all ages, focusing educational efforts on urban and black clients and on those who indicate they are unlikely to use condoms for prevention.

Acknowledgments

This study was supported in part by a contract from the Department of Health, Commonwealth of Pennsylvania, and by funding from the Robert Wood Johnson Nurse Scholars Program and the Family Planning Council of Southeastern Pennsylvania. The Department of Health specifically disclaims responsibility for the analyses, interpretations, and conclusions presented. The views expressed are those of the authors, and no official endorsement of the Robert Wood Johnson Foundation is intended or should be inferred. Also, the project was supported in part by BRSG 2-507 RR05866-06 awarded by the Biomedical Research Support Grant Program, Division of Research Resources, National Institutes of Health.

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Table 1

Percentage of Risk Factors Reported Within High-Risk Group (n = 2400)

	n	Percent of those at high risk	Percent of total
Had sex with one at high risk			
Intravenous drug user	839	35.2	4.8
Bisexual partner	143	6.0	0.8
HIV carrier	101	4.4	0.6
Prostitute	89	3.7	0.5
Two or more sexually transmitted diseases in the past 5 years	904	37.8	5.1
Six or more sexual partners per year since 1978	530	22.7	3.1
Intravenous drug user	291	12.1	1.7
Had blood transfusion 1979–1985	268	11.2	1.5
Got paid for sex	145	6.1	0.8
Has hemophilia	6	0.3	0.0

Note. Percentages do not add to 100% because of multiple risk factors reported.

Table 2

Percentage of Risk Factors Reported Within Moderate-Risk Group (n = 7762)

	n	Percent of those at moderate risk	Percent of total
Two to five partners per year since 1978	6532	84.9	37.9
One sexually transmitted disease in the past 5 years	2277	29.4	13.0
Exposure to blood or blood products	466	6.0	2.7
Sex with someone from Haiti or Africa	139	1.8	0.8
Sex with someone with hemophilia	58	0.8	0.3
Lived in Haiti or Africa	44	0.6	0.3
Received untested sperm	2	0.1	0.0

Note. Percentages do not add to 100% because of multiple risk factors reported.

Table 3

Logistic Regression Models of Risk Status (High versus Not High)

	Odds ratio ^a	Coefficient	Standard error
Model 1			
Age ^b	1.03 [†]	.03	.00
Setting ^c	1.57 [†]	.45	.08
Race 1 ^d	1.09	.09	.08
Race 2 ^e	.77 [*]	-.26	.13
Constant		-2.56	.08
Model 2			
Age	1.03 [†]	.03	.00
Race 1	1.52 [†]	.42	.05
Race 2	1.01	.01	.12
Constant		-2.50	.08

^a The odds ratio indicates the likelihood of change in risk status, given the change in one unit of an explanatory variable (e.g., 1 year of age). An odds ratio greater than one indicates greater risk; an odds ratio less than one indicates less risk.

^b Continuous variable.

^c Urban = 1; nonurban = 0.

^d Black = 1; not black = 0.

^e Latina = 1; not Latina = 0.

^{*} $P < .05$.

[†] $P < .0001$.

Table 4

Logistic Regression Model of Condom Use (Always versus Not Always)

	Odds ratio ^a	Coefficient	Standard error
Age ^a	.95 [†]	-.05	.01
Race 1 ^b	.73 [†]	-.32	.16
Race 2 ^c	.38 [†]	-.97	.18
Couple status ^d	1.73 [†]	.55	.09
Risk status ^e	.75 [*]	-.28	.09
Constant		-2.04	.17

^aContinuous.^bBlack = 1; not black = 0.^cLatina = 1; not Latina = 0.^dSingle = 1; coupled = 0.^eHigh risk = 1; not high risk = 0.^{*} $p < .01$.[†] $p < .0001$.

Table 5

Logistic Regression of Prior HIV Testing (Had versus Not Had)

	Odds ratio	Coefficient	Standard error
Age ^a	1.01 [*]	.01	.01
Race 1 ^b	.90	-.10	.08
Race 2 ^c	1.06	.06	.16
Couple status ^d	.97	-.03	.09
Risk status ^e	3.45 [†]	1.24	.08
Constant		-3.11	.16

^aContinuous.^bBlack = 1; not black = 0.^cLatina = 1; not Latina = 0.^dNot coupled = 1; coupled = 0.^eHigh risk = 1; not high risk = 0.^{*} $p < .01$.[†] $p < .0001$.