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Locus of Control and HIV Risk Among a Sample of Mexican and Puerto Rican Women

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The disproportionate impact of HIV/AIDS on Hispanic women in the United States has been variously attributed to a failure to utilize protective measures due to low levels of HIV knowledge, a denial or minimization of risk, and conflicts with cultural norms. It has been hypothesized that women's relative lack of power in relationships may be associated with higher risk sexual behavior. We examined the relationship between higher risk sexual behavior and perceived locus of control in sexual relationships among a sample of Puerto Rican and Mexican women. We interviewed 71 women of self-reported Mexican ethnicity in San Diego, California, and 79 women of self-reported Puerto Rican ethnicity in Cleveland, Ohio, to examine the relationship between HIV risk, HIV knowledge, and locus of control. Univariate logistic regression indicates that among Puerto Rican women, the perception that locus of control in a sexual relationship resides in the male partner was significantly associated with increased HIV risk, while younger age was significantly associated with increased risk among Mexican women only. In a combined sample of both Puerto Rican and Mexican women, multiple logistic regression analysis indicates that younger age, increased length of residence in the United States, and an other-focused locus of control are significantly associated with increased HIV risk. Women who have been in the United States for relatively longer periods of time may be more likely to integrate U.S. sexual norms into their own behavior and may, as a consequence, be at higher risk of HIV infection. Increased HIV prevention efforts must be made available to Mexican and Puerto Rican women born outside of the United States. These prevention efforts must necessarily focus not only on HIV prevention strategies, but also on the dynamics within male–female intimate relations. Increased attention to younger Puerto Rican and Mexican women is also needed.

KEY WORDS: HIV risk; women; Hispanics; Latinos.

INTRODUCTION

HIV/AIDS has disproportionately affected the Latino communities in the United States (1). In 2001, Hispanics/Latinos accounted for 19% of all diagnosed cases of AIDS, although they represented only 14% of the U.S. population (2). In 2001, the rate of AIDS cases among Hispanics nationwide was 28.0 per 100,000, a rate more than three times higher than that among non-Hispanic whites (3). Among women, the disproportionate impact has been even more striking; of the 816,149 cases of AIDS reported among women through December 2001, 18.4% have been among Hispanic females (3). AIDS surveillance data from 1991 through 1996 indicate that the risk of AIDS for Hispanic women is seven times that of non-Hispanic white women (4, 5). Additionally, a trend has been observed of increasing incidence of AIDS cases among foreign-born Hispanic men and women and heterosexual U.S.-born Hispanics (5).

In San Diego County, Latinos constitute 25% of the population, but accounted for 31% of all new AIDS cases in 1997 (6). The rate of new AIDS cases

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among Latino males was 45 per 100,000, a rate 1.5 times higher than that among non-Hispanic white males in San Diego County. Among Latina females, the rate of new AIDS cases was 6.0 per 100,000, three times the rate among non-Hispanic females (6). The situation is even more alarming in Ohio, where the prevalence rate of HIV/AIDS for 1999 was 246.3 per 100,000 among Latinos, compared with 50 per 100,000 among non-Hispanic whites (7). Although Latinas comprise only 1% of Ohio's female population, they account for nearly 8% of Ohio's AIDS cases (8).

Among Latinos, HIV transmission has been attributed primarily to heterosexual transmission and injection drug use (9). For example, of new AIDS cases diagnosed among Latina women in San Diego County in 1998, 69% were attributable to unprotected heterosexual intercourse (10). Latinas may be at particularly high risk of HIV transmission due to the high-risk behaviors of their sexual partners and their own lack of knowledge about HIV and their own HIV risk (11, 12). Even those Latinas who are concerned about and aware of the risk of HIV transmission may continue to be at risk due to a reluctance to discuss relevant issues, such as condom use, with their partners (13). Hispanics in general have consistently demonstrated lower levels of HIV knowledge compared with non-Hispanic whites and African Americans (14–17). Identified barriers to HIV education among Hispanics include language and cultural differences (18), low literacy levels (19), strong antihomosexual (13) and machismo attitudes (13, 20), a denial or minimization of risk (21), and an emphasis on traditional gender roles and differences (22). Condom use among Hispanic women at risk may be low (20, 23–25), particularly among those who are foreign-born (26) and those who are less acculturated (23, 27). Compared with non-Hispanic white and African American women, Latinas have been found half as likely to use condoms in the context of casual sexual relationships (28). Various explanations have been proffered to explain the relative lack of condom utilization, including conflict with cultural norms (29, 30) and the reduced likelihood that Hispanic men will use condoms with their primary sexual partners compared with their other sexual partners (24, 31, 32).

The negotiation of condom use necessarily occurs within the context of a relationship and expectations of how men and women are to behave sexually within that relationship (33–35). More recently, it has been hypothesized that women's lack of power in relationships may be associated with higher risk behavior (36). Various qualitative studies suggest that many women do not feel efficacious at implementing safer sex practices due to their belief that they lack sufficient power to negotiate and implement safer sex practices in their relationships (37–39). One of the few quantitative studies to examine this hypothesis among Puerto Rican women found that a higher level of commitment to the relationship was predictive of less HIV-related communication and that HIV-related communication mediated the effect of commitment on condom use (36). Our study with a sample of Puerto Rican and Mexican women examined the relationship between women's sense of control in their relationships and their level of HIV risk.

METHOD

Participants

The sample comprised 71 women between the ages of 18 and 45 who self-identified as heterosexual and of Mexican ethnicity, resident in San Diego County, California, and 79 women between the ages of 18 and 45 who self-identified as heterosexual and of Puerto Rican ethnicity, resident in Cuyahoga County, Ohio. Prospective participants were initially screened for eligibility based on self-identified heterosexual orientation, age, and self-identified ethnicity. Individuals were excluded if they self-identified as lesbian or had had voluntary sexual experiences with members of the same sex, were younger or older than the age group of interest, resided outside of the target counties, or were not of the ethnic group of interest within each target county. Those who were found eligible and willing were enrolled after the investigators obtained informed consent.

Participants were recruited through apartment complexes, tenant associations, churches, social service organizations, civic organizations, social clubs, parent–teacher associations, and legal associations. We also utilized participant-referred sampling, so that eligible participants referred others who they believed to be eligible and potentially interested in study participation. Twenty-five of the women of Mexican ethnicity were recruited from among detainees at the facilities of what was then known as the Immigration and Naturalization Service (INS) in order to ensure that individuals who were temporarily detained, but who had been members of the community and who could potentially return once

again to the community, were also represented in the sample.

Interviews

Face-to-face interviews were conducted in San Diego County, California, and Cuyahoga County, Ohio, between January 1998 and June 2000. All interviews were conducted by either the Principal Investigator or one of the trained interviewers; the Principal Investigator and all interviewers are bilingual in English and Spanish. By agreement with the INS, all interviews within the detention facilities were conducted by the Principal Investigator. To reduce self-disclosure bias and participant discomfort, all interviewers were female (40). Interviews were conducted in English and/or Spanish in accordance with the preference voiced by each participant.

Interviews required 2–4 h depending upon the length of each participant's responses. Interviews were conducted, in accordance with the preference expressed by each participant, in participants' homes, at the facilities of community-based organizations, at the detention facilities of the INS, and at church facilities. All interviews were conducted out of hearing distance of others. Interviews conducted at the INS detention facility were conducted out of the hearing distance of all others, but within visual distance of security officers due to security concerns. Participants were offered $10.00 for their participation, an amount that was established in consultation with the members of the community advisory board developed for this study (41).

Measures

The following measures were utilized.

Demographic Characteristics

Data were gathered on age, educational level, ethnicity, household income and composition, employment status and type, country of birth, and time spent in the United States.

Acculturation

Acculturation was assessed using the 24-item Bidimensional Acculturation Scale (BAS) for Hispanics (42). The BAS includes 12 items per cultural domain, Hispanic and non-Hispanic, across the three subscales of language use, language proficiency, and electronic media. Items on the language-use subscale relate to the frequency of usage of both English and Spanish and include questions such as "How often do you speak English with your friends?" and "How often do you think in Spanish?" The linguistic proficiency scale asks the respondents to indicate how well he or she speaks, writes, and understands English and Spanish. Items include, for example, "How well do you understand radio programs in English?" and "How well do you speak Spanish?" The electronic media subscale focuses on the frequency with which the respondent watches television or listens to music or the radio in English and in Spanish. Responses for the three subscales are measured on 4-point Likert scales. Two scores indicate the level of acculturation in each cultural domain, resulting in classification of each individual as Hispanic, non-Hispanic, or bicultural. The scales demonstrated excellent internal consistency (Cronbach's $\alpha = 0.93 - 0.97$). Scores were summed within the subscales for use in multivariable models.

Immigration Status

A modified form of an immigration instrument developed by Loue and Foerstel was used to determine immigration status (43, 44). The assessment tool serves as a decision-making tree; each step is determined by the respondent's answer to the previous question. For instance, the instrument begins by asking the individual if he or she was born in the United States. A positive answer leads the interviewer down one path of questions, while a response in the negative forces questions down another path. The instrument permits individuals to be classified into one of 12 categories, ranging from U.S. citizen to undocumented. This tool has excellent demonstrated validity and reliability ($\kappa = 1.0$) (44). For statistical analyses, these 12 categories were collapsed into two categories: undocumented or U.S. citizen/permanent resident/other legal status.

HIV Knowledge

Practical knowledge of HIV transmission and prevention were tested with a 12-item true–false scale similar to those used in previous studies examining HIV risk behaviors among inner-city women; among white, African American, and Hispanic

heterosexuals in San Francisco; and among sexually active women in Romania (45–47). The stimuli included, for instance, the following statements: birth-control pills protect against the AIDS virus; most people who have the AIDS virus look sick; vaseline and other oils should not be used to lubricate condoms; latex is the best material a condom can be made of for protection against the AIDS virus; condoms cause men physical pain. The internal reliability of this measure has been found to be good (Cronbach's $\alpha = 0.62$).

Locus of Control

A 7-item scale was used to assess locus of control in sexual relationships and decision-making. These items, together with the items that make up all of the other scales developed for this study, are contained in Table I. These items included, for example, the following statements: "My partner would react badly if I suggested the use of a condom"; "The man should be the one to decide if a condom should be used." Responses were scored on a 4-point Likert scale (from 1 = *strongly agree* to 4 = *strongly disagree*). Higher scores indicate that the respondent places the locus of control in the relationship with the partner. Internal reliability was very good (Cronbach's $\alpha = 0.72$).

Condom Barriers

The scale to assess the level of barriers to condom use was constructed using eight items including statements such as, "using condoms is immoral" and "sex is not as good with a condom." Possible responses ranged from 1 (*strongly agree*) to 4 (*strongly disagree*) on a 4-point Likert scale. Lower scores indicate increased barriers. Internal reliability was very good (Cronbach's $\alpha = 0.71$).

Clean Needle Barriers

Barriers to clean needle usage were assessed through the completion of a 4-item scale. One such item states: "It's embarrassing to ask someone for a clean needle." Agreement with each statement was measured with a 4-point Likert scale, ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Internal reliability was very good (Cronbach's $\alpha = 0.68$). Increased barriers are indicated by lower scores on this scale.

HIV Protective Behaviors

Respondents were asked to indicate which of seven possible protective behaviors they had engaged in during the preceding year. Examples of such behaviors include using a condom with at least one sexual partner, asking at least one sexual partner if he had been tested for HIV, and going for an HIV test (see Table I). Responses were coded as 1 for having used the strategy and 2 for not having used it. Lower total scores on this subscale indicate greater use of protective behaviors. Internal reliability of this scale was excellent (Cronbach's $\alpha = 0.93$).

Barriers to HIV Testing

Barriers to HIV testing were determined through the use of a 6-item scale. Two such items were, "If you get an HIV test, it means that you have been doing something bad" and "I wouldn't want anyone to know if I ever had an HIV test." Responses were measured using a 4-point Likert scale. Lower scores indicate higher barriers. Internal reliability was very good (Cronbach's $\alpha = 0.73$).

Perceived Risk

Individuals' level of perceived risk was assessed by means of a 3-item scale that focuses on the individual's perceived likelihood of becoming infected with HIV and her level of worry about becoming infected. Responses ranged from 1 to 4 on a 4-point Likert scale, with lower scores indicating an increased perception of risk. The internal reliability of this scale was excellent (Cronbach's $\alpha = 0.86$).

Actual Risk

Criteria for the classification of individuals at high risk for HIV were modeled from previous studies for the purposes of consistency and comparability (47). Individuals were defined as being at high risk for HIV if they had 1) had multiple sexual partners in the past month and reported any unprotected intercourse; 2) had unprotected intercourse with a partner who they believed to have injected illegal drugs or to have had sex with other people during the past year; 3) had unprotected intercourse with an HIV-positive partner; 4) had unprotected intercourse with a regular partner with

Table I. Scales Constructed to Assess HIV-Related Attitudes

Scale	Questions
Locus of control	If someone's sexual partner does not want to use a condom, the other person can't do much about it.
	My partner would react badly if I suggested the use of a condom.
	Most of my closest women friends use condoms when they have sex with a man.
	Using condoms means that you don't trust your partner.
	The man should be the one to decide if a condom should be used.
	If my sexual partner is having sex with other women/men, there's not much that I can do about it.
Condom barriers	It's embarrassing to buy condoms in a store.
	It's hard to find places to buy a condom.
	Using condoms is immoral.
	Sex is not as good with a condom.
	I do not have a need to use condoms.
Clean needle barriers	It's embarrassing to ask someone for a clean needle.
	Giving people a clean needle just lets them use drugs more often.
	My partner who I share needles with would think that I don't trust him/her if I cleaned the needle before I used it.
	It is too much trouble to carry bleach around to clean needles.
HIV protective behaviors	In the past year done the following: used a condom with at least one sexual partner; used a spermicide with at least one sexual partner; asked at least one sexual partner whether he/she had been tested for HIV; talked about maybe going for an HIV test; went for an HIV test; received the results of an HIV test; told at least one sexual partner the results of the HIV test.
Barriers to HIV testing	I do not have a need to be tested for the AIDS virus.
	It's embarrassing to go to the department of health for an HIV test.
	Even though they tell you that the results of your HIV test are not recorded with your name if it's anonymous, I don't believe them.
	If you get an HIV test, it means that you have been doing something bad.
	I would rather be able to take an HIV test in my home than to have to go somewhere for the test.
	I wouldn't want anyone to know if I ever had an HIV test.
Perceived risk	How concerned are you that you might have had sex with someone who may have given you the AIDS virus?
	What are the chances that you will get HIV/AIDS?
	How worried are you about getting HIV?

whom he or she had been sexually involved for less than 1 year, while uncertain whether that individual had injected drugs or had had sexual intercourse with others; or 5) used injection drugs in the previous 12 months and had shared injection equipment. Use of injection drugs in the previous 12 months, with the use of shared equipment, encompassed not only the use of illegal drugs such as heroin, but also the use of vitamins, steroids, and antibiotics, an injection practice that has been documented among some Hispanics (48, 49). Individuals not meeting any of the high-risk classification categories were considered to be at low risk of HIV transmission.

Statistical Analysis

To determine which predictor variables were significantly associated with high-risk behaviors, we conducted a series of univariate logistic regression analyses. Each factor was analyzed separately to determine its association with high HIV risk among Puerto Ricans, among Mexicans, and among the entire sample. Backwards stepwise regression analysis was conducted to assess the relative contributions of each predictor variable to HIV risk. These multivariate analyses were also conducted separately among the Mexican subsample, the Puerto Rican subsample, and the total sample. Each of the initial multivariate models included all of the variables used in the univariate logistic regression analyses. The three final multivariate models were compared to establish the determinants of risk in each subgroup and to assess the potential need for culture-specific interventions in the target populations. All analyses were performed using SAS.

RESULTS

Demographic characteristics are displayed in Table II. Women of Mexican ethnicity were significantly more likely to have lower levels of education, to be unemployed, to have a lower income, and to be

Table II. Demographic Characteristics ($n = 150$)

Demographic variables	Mexican ($n = 71$)	Puerto Rican ($n = 79$)	Total	p value[a]
Age (years)	30.6	32.0	31.3	0.94
Average years of education	9.7	11.3	10.5	0.62
Years in mainland United States	11.6	14.4	13.1	0.81

	Mexican		Puerto Rican		20 Total		p value[b]
		%	n	%		%	
Age							0.35
<20	9	12.7	6	7.6	15	10.0	
20–29	25	35.2	30	38.0	55	36.7	
30–39	25	35.2	22	27.9	47	31.3	
40–49	12	16.9	21	26.6	33	22.0	
Education							0.004
0–6	13	18.3	7	8.9	20	13.3	
7–12	50	70.4	49	62.0	99	66.0	
13–17	6	8.5	23	29.1	29	19.3	
>17	2	2.8	0	0.0	2	1.3	
Employment							0.05
Employed	29	40.9	45	57.0	74	49.3	
Unemployed	42	59.2	34	43.0	76	50.7	
Annual income							0.04
<$10,000	38	53.4	24	30.4	62	41.3	
$10,001–20,000	20	28.2	36	45.6	56	37.3	
$20,001–30,000	8	11.3	13	16.5	21	14.0	
>$30,000	5	7.0	6	7.6	11	7.3	
Place of birth							<0.001
Mainland United States	10	14.1	17	21.5	27	18.0	
Mexico	61	85.9	2	2.5	63	42.0	
Puerto Rico	0	0.0	60	76.0	60	40.0	
Immigration status							<0.001
United States citizen	15	21.1	79	100.0	94	62.7	
Permanent resident	41	57.8	0	0.0	41	27.3	
Undocumented	15	21.1	0	0.0	15	10.0	
Acculturation level							0.06
Non-Hispanic	9	12.7	12	15.2	21	14.0	
Bicultural	14	19.7	27	34.2	41	27.3	
Hispanic	47	66.2	37	46.8	84	56.0	

[a] t test.
[b] Chi square test.

born outside of the U.S. mainland. Because individuals born in Puerto Rico are U.S. citizens by birth, women of Mexican ethnicity were also less likely to be U.S. citizens. Women of Puerto Rican ethnicity were significantly more likely to respond correctly to the majority of questions relating to HIV knowledge (see Table III).

Nearly one-quarter of the women of each group had engaged in high-risk behaviors (Table IV). Univariate regression analysis indicates that actual risk among the Puerto Rican women was significantly associated with their perception that the locus of control in their relationship resided in their male partner ($p = 0.009$, Table V). The data suggest that length of time spent in the United States may be related to increased risk among Puerto Rican women ($p = 0.07$). Univariate regression analysis indicated that within the sample of Mexican women only, younger women were more likely to perceive HIV risk ($p = 0.02$, data not shown) and were also at increased actual risk of HIV ($p = 0.03$).

Multiple logistic regression analysis for the Puerto Rican women only indicates that an other-focused locus of control remained statistically significant ($p = 0.008$) in predicting increased actual risk. Multiple logistic regression analysis for a combined sample of both Puerto Rican and Mexican women indicates that younger age, increasing length of residence in the Unitrd States, and an other-focused locus of control were significantly associated

Table III. Percentages of Correct Responses to 12 Items Assessing HIV Knowledge ($n = 150$)

Knowledge items	Percent Correct: Mexicans ($n = 71$)	Puerto Ricans ($n = 79$)	Total ($n = 150$)	p value
Birth-control pills protect against the HIV virus. (F)	93.0	98.7	96.0	0.07
If a man pulls out before orgasm, condoms don't need to be used to protect against the AIDS virus. (F)	81.7	86.1	84.0	0.46
Most people who have the AIDS virus look sick. (F)	52.9	69.6	62.0	0.04
Vaseline and other oils should not be used to lubricate condoms. (T)	54.9	74.5	67.3	0.002
Latex is the best material a condom can be made from to protect against the AIDS virus. (T)	67.6	76.0	72.0	0.26
Cleaning injection needles with water is enough to kill the AIDS virus. (F)	87.3	91.1	89.3	0.45
Most people who carry the AIDS virus feel and look healthy. (T)	49.3	54.4	52.0	0.53
Hand lotion is not a good lubricant to use with a condom. (T)	32.4	79.8	86.0	<0.001
A woman is not likely to get the AIDS virus from a man unless he is bisexual. (F)	66.2	96.2	82.0	<0.001
Condoms cause men physical pain. (F)	84.3	57.0	69.8	<0.001
If you're seeing a man (woman) and he (she) agrees not to have sex with other people, it is not important to use a condom. (F)	67.6	57.0	62.0	0.18
Always leave room at the tip of the condom when putting it on. (T)	76.8	78.5	77.7	0.81

Table IV. Numbers of Individuals Classified as High Risk By Each of Five Criteria ($n = 150$)

Risk Criterion	Ethnicity: Mexican n	Mexican %	Puerto Rican n	Puerto Rican %	Total n	Total %	p value
Intercourse with multiple sexual partners during past 30 days and reported any unprotected intercourse	2	2.8	1	1.3	3	2.0	0.50
Unprotected intercourse during last 30 days with partner believed to have injected drugs or to have had sex with other people during past year	14	19.7	16	20.3	30	20.0	0.93
Unprotected intercourse with HIV-positive partner during past 30 days	0	0.0	1	1.3	1	0.7	0.34
Unprotected intercourse with a partner involved with for less than 12 months and uncertain if partner had injected drugs or had sex with others	1	1.4	1	1.3	2	1.3	0.94
Shared injection equipment during past year	2	2.8	2	2.5	4	2.7	0.91
Total number of individuals reporting at least one high-risk behavior	16	22.5	18	22.8	34	22.7	0.97

Table V. Univariate Regression Analysis for Actual Risk by Ethnicity

Independent variable	Mexican				Puerto Rican			
	β	SE[a]	OR[b]	p value	β	SE	OR	p value
Age	−0.75	0.34	0.47		0.40	0.30	1.49	
<20								
20–29								
30–39								
40–49								
Place of birth	−0.90	0.72	0.41	0.21	0.25	0.36	1.29	0.48
United States								
Mexico								
Puerto Rico								
Education	0.34	0.44	1.41	0.44	−0.57	0.47	0.57	0.23
High school or less								
More than high school								
Time in the United States (in yrs)	0.03	0.03	1.03	0.24	0.05	0.03	1.05	0.07
Acculturation	0.45	0.33	1.57	0.17	0.20	0.31	1.22	0.52
High Hispanic								
High non-Hispanic								
Bi-cultural								
Immigration Status	−0.28	0.56	0.75	0.62	Not calculated			
Undocumented								
U.S. citizen								
LPR								
Perceived risk	0.65	0.60	1.91	0.28	0.64	0.54	1.91	0.24
Low								
High								
Locus of control	0.06	1.19	1.06	0.96	1.51	0.58	4.55	0.009
Control								
Less control								

[a]Standard error.
[b]Odds ratio.

with increased HIV risk ($p = 0.04$, $p = 0.01$, $p = 0.02$ respectively, Table VI). In comparing perceived risk with actual risk, multiple logistic regression analysis indicated that younger age was significantly associated with perceived risk among our combined sample of Puerto Rican and Mexican women ($p < 0.04$, data not shown).

DISCUSSION

Our study has been one of the few to distinguish between various Latino ethnicities in assessing the relationship between power, here framed as locus of control, and high-risk sexual behaviors. Our finding of a statistically significant association

Table VI. Multiple Logistic Regression Analysis for Actual Risk Among Puerto Rican and Mexican Women

Independent variable	β	SE[a]	OR[b]	p value
Age	−0.53	0.26	0.59	
<20				
20–29				
30–39				
40–49				
Time in the United States (in yrs)	0.05	0.02	1.05	0.01
Locus of control	1.29	0.54	3.62	0.02
Control				
Less control				

[a]Standard error.
[b]Odds ratio.

between an other-situated locus of control in partner relationships and increased HIV risk among Puerto Rican women is consistent with the findings of previous qualitative and quantitative studies (36). However, we did not find this association among our participants of Mexican ethnicity. The difference noted between the women of Mexican and Puerto Rican ethnicity may reflect differing attitudes relating to women's role in the context of sexual relationships. Alternatively, our inability to detect a similar relationship between locus of control and level of risk among our Mexican respondents may reflect the significant demographic differences between these two groups in our study sample. In either case, additional investigation with a larger sample of Puerto Rican and Mexican women is warranted.

We found that length of time in the United States was significantly associated with increased risk in our combined sample of Mexican and Puerto Rican women, and in Puerto Rican women alone. Women who have migrated to the United States have been exposed to gender role transformations (50) and often adopt less traditional beliefs and values (51–53). The duration and intensity of participants' exposure to less traditional values may have increased with increasing residence in the United States. Participants' elevated risk may reflect their increasing willingness to adopt the less traditional sexual norms of the mainland United States.

Our regression analyses found that younger age was associated with increased risk of HIV transmission among the combined sample of Mexican and Puerto Rican women and among Mexican women only. This finding is consistent with those of previous research indicating that younger women may be less likely to utilize condoms (54). It is possible that women who have migrated to the mainland United States may adopt the more liberal sexual norms that prevail on the mainland, but are not simultaneously being exposed to and adopting behaviors that will reduce the potential risk associated with these less traditional mores. In addition, we found that women of Mexican ethnicity displayed much lower levels of knowledge about HIV and HIV transmission than did the Puerto Rican women in our sample. This would seem to indicate that additional HIV education is needed, particularly for younger, Mexican women.

The generalizability of our findings is limited by the relatively small sample size, by the lack of a random sample, and by reliance on only two study sites. Our reliance on participant referrals for recruitment, however, rather than a random sampling strategy, increased our ability to recruit into the study undocumented individuals who had been residing in the United States for varying periods of time and individuals legally resident in the United States who may not have otherwise volunteered for the study because of concerns about the safety of their undocumented family members (55, 56).

Our findings have direct relevance to the development and implementation of HIV prevention programs for Mexican and Puerto Rican communities in the United States. Women who have been in the United States for relatively longer periods of time may be more likely to integrate U.S. sexual norms into their own behavior and may, as a consequence, be at higher risk of HIV infection. Prevention efforts focusing on these individuals must be intensified to reduce risk. Accordingly, it is critical that increased HIV prevention efforts be made available to Mexican and Puerto Rican women born outside of the United States. These prevention efforts must necessarily focus not only on HIV prevention strategies, but also on the dynamics within male–female intimate relations. Younger Puerto Rican and Mexican women may also be at increased risk of HIV transmission, so that increased attention to this group is also called for.

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