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Predictors of HIV Risk Among Hispanic Farm Workers in South Florida: Women Are at Higher Risk Than Men

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This study examined factors associated with being at risk of sexually acquiring HIV among a community sample of 244 Hispanic migrant and seasonal farm workers. Bilingual staff interviewed respondents anonymously at worksites, camps, and other public venues in South Florida during the 2002 winter/spring growing season. The following variables were positively associated with being at risk of sexually acquiring HIV in multivariable analyses: being female; being married; having "some" or "a lot" of knowledge about HIV transmission, having ever used marijuana, having two or more sex partners in the last 12 months, and having had a sexually transmitted infection. The findings heighten the importance of recognizing women's elevated risk of HIV infection and conducting further studies to examine the factors associated with this increased risk. The study is an important first step toward developing tailored HIV prevention interventions for this at-risk, understudied population.

KEY WORDS: Hispanics; migrants; farm workers; HIV risk practices.

INTRODUCTION

In the United States, migrant and seasonal farm workers (MSFW) are an understudied group whose marginalized status and life circumstances place them at increased risk of HIV infection (Aranda-Naranjo and Gaskins, 1998; Inciardi *et al.*, 1999; Rust, 1990; Organista and Organista, 1997). A confluence of sociodemographic, ecological, and behavioral factors has been suggested as contributing to the spread of HIV in this group (Arnda-Naranjo and Gaskins, 1998; Inciardi *et al.*, 1999; Organista and Organista, 1997). Factors implicated in elevating HIV risk include poverty, limited education, chronic underemployment, long working hours, constant mobility, isolated living areas, hazardous working conditions, limited sanitation facilities, and limited access to health services. Low rates of condom use, frequent use of prostitutes, and high prevalence of sexually transmitted infections (STI) are additional contributors of risk in this population (Lafferty, 1991; Organista and Organista, 1997). These factors heighten the need to direct HIV prevention efforts to MSFW.

Despite the difficulty in determining the exact population size of MSFW in the United States (Rust, 1990), there is consensus that the majority (70%) are Hispanics, primarily of Mexican origin (Aranda-Naranjo and Gaskins, 1998; Organista and Organista, 1997; Organista *et al.*, 2000). HIV prevalence among Hispanics in the United States varies by geography; the highest prevalence rates are found in the eastern states (Centers for Disease Control and Prevention [CDC], 2001). The differences in HIV prevalence are also evident in the three major agricultural streams—the East Coast, Central, and West Coast—that MSFW follow. The limited data available suggest that HIV seroprevalence rates for MSFW in the East Coast stream are higher than those of the central and West Coast streams (Organista and Organista, 1997).

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Studies indicate that MSFW understand the major modes of HIV transmission (Bletzer, 1990; Ford *et al.*, 2001; Organista and Organista, 1997; Organista *et al.*, 2000). However, misinformation regarding the risk of transmission from casual contact (e.g., kissing, coughing, mosquito bites) has been reported (Ford *et al.*, 2001; Organista and Organista, 1997). Although the small sample limits the generalizability of the findings, Schoonover Smith (1988) reported that Mexicans had lower levels of HIV knowledge than Blacks, and Mexican women were the least knowledgeable of all participants.

High rates of HIV risk behaviors among MSFW have been documented. MSFW, especially Hispanics, report low rates of carrying condoms and/or condom use (Ford *et al.*, 2001; Inciardi *et al.*, 1999; Lopez and Ruiz, 1995; Organista and Organista, 1997; Organista *et al.*, 1996, 2000; Schoonover Smith, 1988). For instance, 64% of sexually active, single Hispanic male MSFW (Lopez and Ruiz, 1995) and 66% of Hispanic men and women (Ford *et al.*, 2001) had never used a condom. In a pilot study of Mexican migrants from a small "sending town" in Jalisco, Mexico, known for its long history of outmigration to the United States, Organista *et al.* (1996) found that condom use and carrying condoms were associated with having friends that carried and used condoms, and being married. In their follow-up study of 501 Mexican migrants conducted in five such "sending towns" in the same Mexican province, carrying condoms was predicted by procondom social norms, less negative attitudes toward condoms, and condom self-efficacy (Organista *et al.*, 2000). Condom use with occasional sex partners was predicted by carrying condoms and condom self-efficacy, while condom use with regular partners was predicted by procondom social norms, less negative attitudes toward condoms, not knowing someone with HIV, and condom self-efficacy (Organista *et al.*, 2000).

Multiple sexual partnerships and high rates of lifetime STIs are also common (Ford, *et al.*, 2001; Inciardi *et al.*, 1999; Lopez and Ruiz, 1995). Male MSFW reported a considerably higher number of lifetime partners than did women (Ford *et al.*, 2001; Inciardi *et al.*, 1999). Furthermore, lifetime rates of use of prostitutes are high (Aranda-Naranjo and Gaskins, 1998; Inciardi *et al.*, 1999; Organista and Organista, 1997), ranging from 18% (Lafferty, 1991) to more than 40% (Inciardi *et al.*, 1999; Organista and Organista, 1997). Married men are less likely to use condoms with prostitutes than are single men (Aranda-Naranjo and Gaskins, 1998). Active solicitation in the migrant camps by prostitutes (Beltzer, 1995; Organista and Organista, 1997) and norms supporting prostitute use have been reported. Ford *et al.* (2001) found that 72% of men discussed visiting prostitutes with friends, and 85% reported being urged to visit prostitutes. Because most of these studies reported only descriptive statistics, their contribution to understanding the factors associated with sexual risk is limited.

Rates of illegal injection drug use among MSFW are relatively low (Aranda-Naranjo and Gaskins, 1998; Inciardi *et al.*, 1999; Organista and Organista, 1997). However, therapeutic injections of vitamins, antibiotics, hormones, pain killers, and steroids have been reported (Lafferty, 1991; McVea, 1997; Organista and Organista, 1997). High rates of alcohol use among both men and women have been documented, although men report higher consumption and more frequent use of alcohol than do women (Ford *et al.*, 2001; Inciardi *et al.*, 1999). Furthermore, adolescent MSFW (<21 years of age) had higher rates of lifetime drug use than did adults (Ford *et al.*, 2001). Unfortunately, these studies did not examine the relationship between drug use and sexual risk and the factors associated with these behaviors.

Despite the documented HIV risk in this population, methodological issues limit the usefulness of current data to guide development of effective HIV prevention programs. First, relatively few studies have exclusively focused on Hispanic MSFW even though they are the largest proportion of this population. Collapsing across diverse racial and ethnic groups could obfuscate differences in risk behaviors and the factors associated with high-risk practices (Marin and Gomez, 1997; Marin and Marin, 1991; Organista and Organista, 1997). Second, most studies describe the prevalence of selected attitudes and behaviors, but they do not include multivariable models that explain the factors associated with HIV risk in this population. Third, despite high HIV seroprevalence rates, few studies have focused exclusively on Hispanic MSFW from the East Coast stream. Finally, the few studies on East Coast stream MSFW are dated (Castro *et al.*, 1988), have small sample sizes (Ford *et al.*, 2001), use only descriptive statistics (Ford *et al.*, 2001), underrepresent women in the sample, or focus on select subgroups, such as drug users (Inciardi *et al.*, 1999), all of which reduce their generalizability.

The goal of this exploratory study was to understand the factors associated with behaviors that increase the risk of sexually acquiring HIV infection among a community sample of Hispanic MSFW in South Florida, an area with one of the highest HIV

rates in the nation (CDC, 2001). We expected that being at risk for sexually acquiring HIV would be positively associated with having been diagnosed with an STI, exchanging sex for drugs or money, having a higher number of sex partners, using drugs, having been tested for HIV, worrying about HIV, perceiving one's partner to be at risk for HIV, and being born in the United States. On the other hand, we anticipated that being a woman, being older, and having higher levels of education, higher income, and higher levels of HIV knowledge would be negatively associated with being at risk of sexually acquiring HIV infection.

METHODS

Participants

From February to June 2002, we recruited a community sample of 121 male and 123 female Hispanic MSFW to participate in a study of HIV-related risk behaviors. The study was conducted in southern Miami-Dade County, Florida. This area is significant because there is a stable population of farm workers who reside in the area year round as well as a transitory group of migrants who come to work the fields during the winter and spring. The eligibility criteria for participation were (1) being 18 years of age or older, (2) being self-identified as Hispanic/Latino, and (3) being employed as a farm worker. To facilitate entrée and access to the study population, we collaborated with MUJER, a community-based social service organization that serves farm workers in the area.

Procedures

We used time and space sampling procedures (Stueve *et al.*, 2001; Valleroy *et al.*, 2000) modified for use with this population. We worked with MUJER staff to identify the list of potential venues in which to recruit participants. These venues included worksites, camps, fields, parks, markets, and other public venues where farm workers congregated. From the list of potential venues identified, we systematically rotated recruitment sites to ensure that our sample included as broad a representation of Hispanic MSFW as possible. For each venue, we specified time periods of maximum activity, and randomly selected sampling events (days and blocks of time when recruitment occurred) from these periods. In camps, parks, markets, and other such sites, we defined a specific geographic area and systematically approached individuals who entered the area. In the fields, we systematically defined an area, and approached every person working in the area. Men and women were screened for eligibility and, if eligible, invited to participate. Approximately 99% of eligible respondents agreed to participate.

Trained, bilingual staff administered anonymous, structured interviews after obtaining verbal informed consent. Responses were recorded on scannable forms created with Teleforms. Interviews were completed at the time of recruitment and lasted approximately 35 min. Respondents were given $25 as compensation. The protocol was approved by the institutional review boards at the University of Miami and the Centers for Disease Control and Prevention. The following factors were assessed.

Measures

Demographics

Participants reported their gender, age, education, marital status, average weekly income, country of birth, and the number of years lived in the United States. They reported whether they were citizens, permanent residents, active visa holders, or undocumented.

Health Care Utilization

Participants indicated whether they had health insurance and whether they had sought medical care at an emergency room or from a health care provider.

HIV Knowledge

We used the following five dichotomous items to assess general knowledge of HIV: (1) Can a pregnant woman who has HIV give HIV to her baby? (2) Can you get HIV from having sex without using a condom? (3) Is there a cure for HIV? (4) Can a person have HIV for a long time and not know it? and (5) The way a person learns if they have HIV is to get an HIV test. For these analyses, we collapsed the number of correct responses into two categories: little or no knowledge (two or fewer correct responses) and some to a lot of knowledge (three or more correct responses).

HIV Testing

Participants stated whether they had been tested for HIV.

HIV Risk Perceptions

Using a 4-point scale, participants reported how much they worried about getting HIV (*not at all* to *a lot*).

Perceived Partner Risk

For the last 12 months, participants reported whether they had sex with someone they knew or suspected (1) was having sex with other people, (2) had injected drugs, (3) had an STI, (4) had been in jail, or (5) was HIV positive. We compared individuals who stated they had at least one perceived partner risk with those who had not endorsed any partner risk.

Drug Use

Participants reported whether they had ever used alcohol, marijuana, cocaine/crack, heroin, or inhalants, and stated whether they had ever injected drugs or shared needles. For each affirmative response, participants stated whether they had used the substance or engaged in the behavior during the last 3 months. Rates of heroin, inhalant, and injection drug use were so small (<1%) that we do not report them.

Sexual Behaviors

Participants reported the number of male and female sex partners they had during the last 12 months and whether they had used condoms in the same time period. Respondents stated the frequency with which they engaged in vaginal or anal sex during the last 3 months and the number of times a condom had been used for each type of sex act. They reported whether they had exchanged money for sex or sex for money in the last 12 months.

History of STI

Participants stated whether they had ever been diagnosed with an STI by a health care provider.

Dependent Variable

We defined our dependent variable to be being at risk of sexually acquiring HIV infection. We used sexual behavior data to calculate the proportion of condom-protected vaginal or anal intercourse occasions during the last 3 months. Individuals who used condoms consistently (100% of intercourse occasions) or had no vaginal or anal intercourse during the last 3 months were categorized as being at little or no risk of acquiring HIV infection sexually ($n = 110$). Those who never used condoms or used them inconsistently were categorized as being at risk of acquiring HIV infection sexually ($n = 134$). Thus, our dependent variable examines behaviors associated with risk and not likelihood of HIV transmission.

Analyses

Means, medians, and proportions were calculated to describe the characteristics of the sample. Univariable logistic regression was performed on theoretically relevant factors to examine the relationship between each one and the outcome variable. Chi-square statistics and odds ratios were generated with 95% confidence intervals to guide interpretation. Following the recommendations of Hosmer and Lemeshow (2000), factors with p values of .20 or lower in the univariable analyses were included as candidate predictors in the multivariable analysis because use of more traditional significance values (i.e., .05) might fail to identify important relationships. Candidate predictors were simultaneously entered into a multivariable logistic regression. Predictors not significant at the .05 level or lower were eliminated from the model one at a time, deleting the one with the highest p value at each step.

RESULTS

Sample Characteristics

Sample characteristics are summarized in Table I. Men constituted 49.6% of the sample and women 50.4%. Eighty-two percent of the participants were born outside of the United States, primarily in Mexico (63.1%) and Guatemala (14.3%). These foreign-born participants had lived in the United States a mean of 5.8 years. Only 21% of the sample had ever been tested for HIV, and 26.6% reported worrying "some"

Table I. Sample Characteristics

	Total ($N = 244$)
Demographic	
Gender	
Female	123 (50.4%)
Male	121 (49.6%)
Age (years)	
Mean	28.4
SD	9.0
Median	27
Mode	18
Education (years)	
12+	27 (11.1%)
7–11	58 (23.8%)
0–6	159 (65.2%)
Marital status	
Married	74 (30.3%)
Not married	170 (69.7%)
Income (dollars per week)	
201+	90 (36.9%)
0–200	154 (63.1%)
United States born	
Yes	45 (18.4%)
No	199 (81.6%)
Country of birth	
United States	45 (18.4%)
Mexico	154 (63.1%)
Guatemala	35 (14.3%)
Other	10 (4.2%)
Years in United States (foreign-born participants)	
Mean	5.83
SD	7.2
Median	3
Mode	3
Residency status	
Documented	83 (34.0%)
Not documented	161 (66.0%)
Health care utilization	
Any type of health insurance	
Yes	21 (8.6%)
No	223 (91.4%)
Seen health care provider in last 12 months	
Yes	61 (25.0%)
No	183 (75.0%)
Visited emergency room in last 12 months	
Yes	31 (12.7%)
No	213 (87.3%)
HIV knowledge	
Composite score: number of correct items	
Some to a lot (3 or more items)	168 (68.9%)
Little or none (0–2 items)	76 (31.1%)
HIV testing	
Ever HIV tested	
Yes	51 (20.9%)
No	193 (79.1%)
HIV risk perceptions	
Worry about getting HIV	
Some/a lot	65 (26.6%)
Not at all/a little	179 (73.4%)
Perceived partner risk	
One or more items endorsed	83 (34.0%)
No items endorsed	161 (66.0%)
Drug use (lifetime use)	
Alcohol	
Yes	152 (62.3%)
No	92 (37.7%)
Marijuana	
Yes	57 (23.4%)
No	187 (76.6%)
Cocaine/crack	
Yes	42 (17.2%)
No	202 (82.8%)
Sexual behaviors	
Number of sex partners in last 12 months	
2+	82 (33.6%)
0–1	162 (66.4%)
Mean	2.30
SD	3.2
Have paid/been paid for sex in last 12 months	
Yes	47 (19.3%)
No	197 (80.7%)
Ever used condoms in last 12 months	
Yes	82 (33.6%)
No	162 (66.4%)
STI history	
Ever STI	
Yes	38 (15.6%)
No	206 (84.4%)
HIV risk (dependent variable)	
At risk	134 (54.9%)
Not at risk	110 (45.1%)

to "a lot" about getting HIV. Sixty-six percent of participants had not used a condom in the last 12 months and 33.6% reported having two or more sex partners in the same time period. Sixteen percent reported having been diagnosed with an STI. Seventeen percent of the sample had used cocaine and 23.4% had used marijuana at some point in their lives. Using the criteria for our dependent variable, we classified almost 55% of respondents as being at risk for sexually acquiring HIV infection.

Univariable Predictors of Sexual Risk

Table II presents the univariable analyses comparing respondents classified as being at risk for sexually acquiring HIV infection ($n = 134$) with those classified as not being at risk for sexually acquiring HIV infection ($n = 110$). Being at risk for sexually acquiring HIV infection was positively associated with being female, being born in the United States, having

Table II. Univariable Comparisons of Being At Risk of Sexually Acquiring HIV Infection by Demographic Factors, HIV Knowledge, HIV Testing History, HIV Risk Perceptions, Perceived Partner Risk, Drug Use, Sexual Behavior, and STI History ($N = 244$)

	Odds	95% Confidence interval
Demographic		
Age	1.02	0.99–1.05†
Gender		
Female	4.42	2.57–7.59***
Male (reference)		
Education (years)		
12+	1.17	0.51–2.66
7–11	1.65	0.89–3.07†
0–6 (reference)		
Income (dollars per week)		
201+	0.84	0.49–1.41
0–200 (reference)		
United States born		
Yes	4.12	1.88–9.00***
No (reference)		
Marital status		
Married	1.66	0.94–2.90†
Not married		
HIV knowledge		
Composite score		
Some to a lot (3 or more items)	3.46	1.95–6.11***
Little or none (0–2 items) (reference)		
HIV Testing		
Ever HIV tested		
Yes	2.61	1.33–5.14**
No (reference)		
HIV risk perceptions		
Worry about getting HIV		
Some/a lot	1.89	1.04–3.41**
Not at all/a little (reference)		
Perceived partner risk		
1+ items	4.37	2.40–7.97***
No items (reference)		
Drug use (lifetime use)		
Alcohol		
Yes	1.70	1.00–2.86**
No (reference)		
Marijuana		
Yes	6.26	2.90–13.49***
No (reference)		
Cocaine/crack		
Yes	6.36	2.56–15.76***
No (reference)		
Sexual behavior		
Number of sex partners in last 12 months		
2+	3.24	1.81–5.78***
0–1 (reference)		
Have paid/been paid for sex in last 12 months		
Yes	1.57	0.81–3.04†
No (reference)		
STI history		
Ever STI		
Yes	9.01	3.08–26.30***
No (reference)		

***$p \leq .00$; **$p \leq .01$; *$p \leq .05$; †$p \leq .20$.

at least "some" HIV knowledge, having been previously HIV tested, worrying about getting HIV, reporting having had sex with a partner with at least one perceived risk, having ever used alcohol, marijuana and/or cocaine/crack use, having two or more sex partners in the last 12 months, and ever having been diagnosed with an STI.

Multivariable Model of Sexual Risk

Table III presents the results of the backward stepwise regression analyses comparing respondents classified as being at risk for sexually acquiring HIV with those classified as not being at risk for sexually acquiring HIV. Variables shown in the table are the variables that remained in the final model. Women and married respondents were more than four times more likely to be at risk for sexually acquiring HIV than were men and unmarried respondents. Individuals who had at least "some" HIV knowledge were 2.76 times more likely to be at risk for sexually acquiring HIV than participants with "little" or no knowledge. Respondents who had ever used marijuana were 3.79 times more likely to be at risk for sexually acquiring HIV than participants who had never used marijuana. Interestingly, participants who reported lifetime alcohol use were less likely to be classified as being at risk than participants who reported no lifetime consumption of alcohol. Individuals who reported no lifetime consumption of alcohol were 1.26 times more likely to be at risk than respondents with lifetime consumption. Participants who had been diagnosed with a STI were nearly five times more likely to be at risk for sexually acquiring HIV than those who that had not had a STI, and those with two or more partners in the previous year were more than four times more likely to be at risk than were those with one or no partner. Post hoc analyses were conducted to test for the significance of two-way interactions. These tests were inclusive because of small cell sizes. The model, with the covariates shown, was reliably different from the intercept-only model ($\chi^2 = 101.17$, $df = 9$, $p < .000$) and correctly classified 76.1% of the respondents who were at risk

Table III. Results of Backward Stepwise Regression Analyses of Being At Risk of Sexually Acquiring HIV Infection by Demographics, HIV Knowledge, Perceived Partner Risk, Drug Use, Sexual Behavior, and STI History ($N = 244$)

	Odds	95% Confidence interval
Demographic		
Gender		
Female	4.44	2.22–8.86***
Male (reference)		
Marital status		
Married	4.83	2.28–10.20***
Not married		
HIV knowledge		
Composite Score		
Some to a lot (3 or more items)	2.76	1.32–5.76**
Little or none (0–2 items) (reference)		
Perceived partner risk		
1+ items	2.71	0.93–7.90
No items (reference)		
Drug use (lifetime use)		
Alcohol		
Yes	0.45	0.21–0.94*
No (reference)		
Marijuana		
Yes	3.79	1.43–10.06**
No (reference)		
Sexual behavior		
Number of sex partners in last 12 months		
2+	4.39	1.46–13.17**
0–1 (reference)		
Have paid/been paid for sex in last 12 months		
Yes	0.25	0.06–1.02
No (reference)		
STI history		
Ever STI		
Yes	4.99	1.34–18.54*
No (reference)		
Model summary statistics		
Chi-square	101.73	
Nagelkerke R square	.45	
Percentage classified correctly	75.80	

***$p \leq .000$; **$p \leq .01$; *$p \leq .05$.

for sexually acquiring HIV and 75.5% of respondents not at risk. Nagelkerke's R^2 value, a statistical measure that estimates variations in outcome variables explained by a logistic regression model (SPSS Inc., 2001), was utilized to determine how effective the model explained the variance in the dependent variable. Nagelkerke's R^2 value was .45. This indicates that the model explains 45% of the variance in being at risk of sexually acquiring HIV.

DISCUSSION

We report on a community sample of Hispanic MSFW from Miami-Dade County, Florida, an area which has been severely affected by HIV infection (CDC, 2001). The study is noteworthy because of its moderately large sample size, equal proportions of men and women, inclusion of United States-born, non-Mexican-born, and Mexican-born MSFW, focus on Hispanic MSFW from the East Coast stream, sampling methods employed, and use of multivariable statistics. The study extends the existing literature by using multivariable statistics to identify theoretically relevant variables significantly and independently associated with being at risk of sexually acquiring HIV infection among male and female Hispanic MSFW working in an AIDS epicenter in the Eastern United States.

The study demonstrates that MSFW working in an East Coast AIDS epicenter are engaging in behaviors that elevate their risk of sexually acquiring HIV infection. For instance, lifetime rates of STI in the sample (15.6%) were higher than the 9% reported by Lopez and Ruiz (1995). The percentage of respondents who had not used condoms during the last 12 months (66%) was higher than the 50% previously reported (Foulk *et al.*, 1989; Lafferty, 1991). In our study, almost 20% of respondents had paid for or been paid for sex; 33% of men had paid for sex, and 5% of men and 15% of women had been paid for sex. Although rates of paying for sex among men are comparable with the 30% reported among Mexican male farm workers in Northern California (Lopez and Ruiz, 1995), the finding that 15% of women had been paid for sex is troubling and should be further studied.

Similar to other studies (Ford *et al.*, 2001; Organista and Organista, 1997), 68.9% of our sample reported having "some" or "a lot" of knowledge regarding HIV transmission. Yet, 22.2% had never heard of HIV and only 21% had ever been tested for HIV. Not surprisingly, the majority (69%) of those tested were women of childbearing age, which reflects current practice standards regarding routine offering of HIV testing in obstetric settings (Stoto *et al.*, 1999).

One of our surprising findings is that women were 4.44 times more likely to be at risk of sexually acquiring HIV than men. This finding differs from those previously reported and seems to counter the traditional Latino cultural norm regarding *Marianismo* (the belief that women should remain virginal and chaste until marriage and be a reflection of the

Virgin Mary) and stereotypic portrayals of Latina women as virginal and subservient to men (Marin and Gomez, 1997; Marin and Marin, 1991; Fernández, 1995). To more fully elucidate this relationship, studies that include a comprehensive assessment of sociocultural predictors of HIV risk among Latina MSFW are needed. Additionally, its is conceivable that this finding highlights the need to examine traditional assumptions that are often made about Latinas and points to the importance of designing prevention programs that address their current reality as opposed to cultural stereotypes.

This study demonstrates, once again, that information alone does not always lead to behavior change. In the multivariable model, respondents with higher HIV knowledge were 2.76 times more likely to be at risk of sexually acquiring HIV infection than those who had lower levels of knowledge. It could be that higher levels of knowledge might serve as an additional marker that a person might be engaging in risk behavior. Interestingly, perceptions of one's personal HIV risk and perceptions of sex partner's HIV risk were not significantly associated with being at risk of sexually acquiring HIV infection in the multivariable analyses. This suggests that raising MSFW's sense of personal vulnerability to HIV infection, a common theoretical component in many effective HIV prevention interventions (Fishbein *et al.*, 1991), may not be as effective for risk reduction interventions for this population.

Lifetime use of alcohol was negatively associated with being at risk of sexually acquiring HIV infection at the multivariable level. Because it is counterintuitive and contradicts previous findings, we conducted additional analyses to try to explain this relationship. These analyses did not yield additional explanations. It may be that lifetime alcohol use may not be an ideal predictor of risk since by adulthood most people have tried alcohol at some point. Future studies should consider assessing problem use of alcohol and sex under the influence of alcohol.

Individuals who had used marijuana were 3.79 times more likely to be at sexual risk than those who had not used marijuana. Research with other populations has shown that use of marijuana might function as a "gateway" to other drugs and that it may reduce inhibitions and could promote sexual risk taking (Morral *et al.*, 2002). It is possible that this also holds true for Hispanic MSFW. Lifetime history of STI infection and having two or more sex partners in the last 12 months were significantly associated with being at risk of sexually acquiring HIV infection. Further studies to elucidate these relationships should be conducted.

Although the backward stepwise regression analysis is exploratory in nature and the results should be interpreted with caution, some of our findings warrant further study. As predicted, being at risk for sexually acquiring HIV was positively associated with having been diagnosed with an STI, having a higher number of sex partners, and using marijuana. However, it was also significantly associated with being a woman and having higher levels of HIV knowledge. Alternatively, having been tested for HIV, being of younger age, worrying about HIV, and being born in the United States, factors that predicted risk in other studies, were not significant in our model. The study would have been strengthened if we had included multiple assessment points, had assessed sexual behavior by partner type, and had measured attitudinal variables such as condom self-efficacy, procondom social norms, and condom-carrying practices, three important predictors of condom use in the study by Organista *et al.* (2000). Longitudinal studies examining HIV risk in the different migrant streams are needed.

The findings suggest several implications for HIV prevention efforts for this population. First, effective, culturally sensitive HIV prevention interventions tailored to the different realities of male and female Hispanic MSFW must be developed and tested. Although there was one nonpublished study cited by Organista and Organista (1997), we did not find any HIV prevention interventions specifically targeted to Hispanic MSFW in the published literature we reviewed. Given the documented HIV risk in this population, the unavailability of a tested prevention intervention for this population is unfortunate. Second, researchers and practitioners should examine their assumptions and beliefs regarding female Hispanic MSFW. Although HIV risk for some women may stem directly from their sex partners' behaviors, some Latinas are engaging in HIV risk behaviors themselves. Prevention interventions for women must address risk from both perspectives. Third, efforts to improve the living and working situations of MSFW must be continued. HIV is rapidly becoming a disease of the poor and disadvantaged in the United States. Fourth, public health practitioners and community-based organizations should offer HIV prevention services in places where MSFW naturally congregate such as worksites, camps, markets, and churches. Fifth, free HIV testing should be provided and MSFW should be encouraged to learn their HIV status. For maximum access, testing should be offered in nontraditional settings during

nontraditional hours. In areas with high HIV prevalence such as South Florida, frequent use of prostitutes (33% of men had paid for sex in the last 12 months) and low rates of condom use (66% of the sample had not used a condom in the last 12 months) are of particular concern for transmission of HIV and other STI. Furthermore, since women married to MSFW engage in unprotected sexual contact with their spouses during their spouses' visit home (Salgado de Snyder *et al.*, 1996), it is possible that these men may become infected and unwittingly transmit HIV to their spouses.

In conclusion, this study confirms high rates of HIV risk behaviors among Hispanic male and female MSFW. It also identifies women as being at especially high risk and suggests that prevention interventions need to include issues related to prostitution and use of marijuana as a possible gateway drug. By identifying a set of theoretically relevant multivariable predictors of being at risk of sexually acquiring HIV infection, this study is an important first step toward developing tailored, culturally relevant HIV prevention interventions for this at-risk, understudied population. The findings heighten the importance of recognizing women's elevated risk of HIV infection. There is a pressing need to conduct additional studies that separately examine psychological, cultural, and relationship factors associated with HIV risk behaviors among male and female Hispanic MSFW so that effective prevention interventions could be developed.

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