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## HIV Infection, Risk Behaviors, and Depressive Symptoms among Puerto Rican Sex Workers

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### ABSTRACT

This paper examines the association of depressive symptoms with human immunodeficiency virus (HIV) infection and risk behaviors among 127 sex workers. Data were obtained by a structured interview and blood specimens tested for HIV. Findings showed a high prevalence rate of depressive symptoms for all sex workers regardless of HIV infection status. Results of a logistic regression analysis indicated that the use of injected drugs and engaging in unprotected intercourse with clients were strongly associated with a high level of depressive symptoms. (*Am J Public Health.* 1994;84:2000-2002)

### Introduction

The acquired immunodeficiency syndrome (AIDS) pandemic is a serious problem for Puerto Ricans.<sup>1,2</sup> Among US states and territories, Puerto Rico ranks third in annual AIDS incidence rates.<sup>3</sup> The rates are high among women,<sup>4,5</sup> especially those working in prostitution.<sup>6</sup> The nature of the AIDS pandemic emphasizes the need for changing behaviors that place people at risk for the human immunodeficiency virus (HIV). Researchers agree that risk reduction strategies for HIV among sex workers require a research agenda that examines the psychological, physical, and social conditions of this population.<sup>11,12</sup> This paper is one of the first research efforts aimed at examining the association between sex workers' psychological status and their HIV serostatus and risk behaviors. We believe that a greater understanding of the psychological factors that affect sex workers is an important precursor to the design of effective prevention strategies.

### Methods

We collected information on 127 sex workers (52 in brothels and 75 in the streets). Outreach activities were conducted at three brothels and four street locations throughout the island. After extensive information had been provided, the women voluntarily agreed to participate. Data about risk behaviors during the previous 6 months were collected via a

structured interview. Although detailed information was obtained, some data reduction was performed. The frequency of condom use was dichotomized to always and not always. Respondents were asked about the use of 12 commonly abused drugs. If a positive response was obtained, information about the route of administration was collected. Respondents who indicated injecting any specific drug were defined as injected drug users. Depressive symptomatology was measured by the Center for Epidemiologic Studies Depression Scale, an instrument that has been used previously with Puerto Ricans.<sup>13,14</sup> A cutoff point of 16 has been accepted as appropriate for identifying individuals with an elevated number of symptoms.<sup>15-19</sup> Blood samples were tested for antibodies against HIV and syphilis. Pretest counseling was provided. Appoint-

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This paper was accepted December 28, 1993.

ments were scheduled for providing test results and follow-up counseling.

Odds ratios (ORs) were calculated as the primary measure of association between depressive symptoms and HIV behavioral risks. Logistic regression analysis with backward elimination was used to identify major risk factors for depression. At least half of the respondents who were HIV positive had received previous HIV test results. Since HIV status is known to be a confounder for depression,<sup>20-22</sup> logistic regression was used to adjust odds ratios for HIV laboratory test results.

## Results

Seventy percent of the sex workers fell into the high depressive category (Table 1). A high rate of depressive symptoms was observed among women who were HIV seropositive (91.4%). However, 58% of the women who were seronegative also reported high depressive symptomatology.

The participants ranged in age from 18 to 60 years (mean = 32 years). The prevalence of depressive symptoms did not differ significantly across age or educational level. In comparisons between work sites, street sex workers reached significantly higher levels of depressive symptoms (86.8%) than did brothel sex workers (45.1%).

Participants were distributed evenly among those who injected drugs (47.2%) and those who did not (52.8%). However, a significantly higher proportion of injected drug users (90.0%) than nonusers (52.2%) reached high levels of depressive symptoms.

Approximately 40% of the participants reported that not all of their clients used condoms during intercourse or oral sex. The risk of high depressive symptomatology was about eight times higher for these women than for those who engaged in protected sex. Participants who tested positive for syphilis also had higher levels of depressive symptoms than those with negative results.

Logistic regression analyses were conducted to assess simultaneously the association of Table 1 variables with depressive symptoms. High levels of depressive symptomatology were associated with both unprotected intercourse and injected drug use (Table 2). Sex workers who had unprotected intercourse with clients were more than four times as likely as those who always had protected intercourse to report high rates of depressive symptoms (OR = 4.92, 95% confidence

**TABLE 1—Percentage Distribution and Odds Ratio Estimates of Sociodemographic Characteristics and HIV Risk Behaviors, by Level of Depressive Symptoms**

	No. <sup>a</sup>	Depressive Symptoms, %		Odds Ratio	95% Confidence Interval
		High	Low		
Overall	127	70.1	29.9	...	...
Serostatus					
Positive	35	91.4	8.6	7.69	2.1, 27.4
Negative	74	58.1	41.9		
Age, y					
18-24	18	77.8	22.2	1.00	...
25-34	54	77.8	22.2	1.00	0.25, 4.95
35+	42	61.9	38.1	2.15	0.80, 5.83
Education, y					
≤ 11	77	70.1	29.9	1.31	0.49, 3.42
12	25	76.0	24.0	1.76	0.50, 6.40
> 12	25	64.0	36.0	1.00	...
Work area					
Street	75	86.8	13.2	7.88	3.37, 19.46
Brothel	52	45.1	54.9		
Injected drug use					
Yes	60	90.0	10.0	8.09	3.18, 23.24
No	67	52.2	47.8		
Uses condom with intercourse					
Not always	46	91.3	8.7	7.81	2.69, 27.99
Always	72	56.9	43.1		
Uses condom with oral sex					
Not always	47	89.4	10.6	8.51	3.09, 27.19
Always	57	52.6	47.4		
Syphilis					
Positive	32	84.4	15.6	3.04	1.10, 9.75
Negative	80	63.7	36.3		

<sup>a</sup>Numbers do not total 127 because of missing data.

**TABLE 2—Association between HIV Risk Behaviors and Level of Depressive Symptoms: Logistic Regression**

	Unadjusted		Adjusted for HIV Status	
	Odds Ratio <sup>a</sup>	95% Confidence Interval	Odds Ratio <sup>b</sup>	95% Confidence Interval
Unprotected intercourse	4.92	1.49, 16.26	4.05	1.17, 13.98
Injected drug use	7.57	2.56, 22.36	4.48	1.22, 16.33

<sup>a</sup>n = 118.

<sup>b</sup>n = 103.

interval (CI) = 1.49, 16.26). Injected drug users were about seven times more likely than those who did not inject drugs to reach high levels of depressive symptoms (OR = 7.57, 95% CI = 2.56, 22.36). Similar findings were observed after adjusting

for HIV serostatus. Injected drug use and engaging in unprotected intercourse with clients were strongly associated with a high level of depressive symptoms independent of the participant's HIV serostatus.

## Discussion

Of particular concern is the finding that 70% of the participants had high levels of depressive symptoms. There are marked differences between these results and those observed in a study on Puerto Rican women on the island and in New York City.<sup>13</sup> The rate of high depressive symptoms for each of these groups was approximately 33%, less than half the level found in our study. These data indicate that the high level of depressive symptoms observed for study participants appears to be a serious problem facing these women.

Little is known about the psychological status of sex workers, partly as a result of the difficulty of recruiting such individuals given the stigmatization they experience and the coercive actions taken against them. Although this was a convenience sample, outreaches were conducted at major identified brothels and street prostitution areas. A small number of participants were enrolled at each site to generate a sample that would reflect the diversity of the sex worker population. Although our participants were not representative of the entire population of sex workers, data from this study provide valuable information.

Analyses aimed at examining the association between HIV risk behaviors and depressive symptoms showed that sex workers with high depressive symptomatology were more likely to report behaviors that placed them at risk for HIV infection. This finding suggests that HIV risk reduction strategies among sex workers should take into consideration the level of distress they experience. Sadness and apathy associated with depression may interfere with the motivation necessary for appropriate HIV risk reducing behaviors. The presence of depressive symptoms may also contribute to a higher degree of

isolation and less accessibility for prevention efforts. The possible effects of depressive symptoms on intervention strategies aimed at this population need to be further examined. □

## Acknowledgments

This study was supported by grant G12-RR-03051 from the National Institutes of Health, Research Center in Minority Institutions.

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