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Condom use among female sex workers and their non-commercial partners: Effects of a sexual risk intervention in two Mexican cities

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Abstract

The purpose of this study was to examine whether a brief behavioral intervention promoting condom use among female sex workers (FSWs) and their clients had the added benefit of increasing condom use among FSWs and their steady, non-commercial partners (e.g., husbands, boyfriends). Participants were 362 FSWs, aged 18, living in Tijuana or Ciudad Juarez, Mexico, who received a behavioral intervention to promote condom use with clients. Repeated measures negative binomial regression was used to assess FSWs' condom use with steady partners versus clients across time. Results showed that FSWs engaged in unprotected sex with steady partners more than with their clients, and that the intervention changed FSWs' condom use with clients but not their steady partners. HIV prevention interventions for FSWs should promote consistent condom use across partner type. Targeting couples rather than individuals may also be necessary.

Introduction

There are several successful HIV prevention interventions promoting consistent condom use with clients among female sex workers (FSWs);^{1–3} however, few of these studies examine the generalizability of FSWs' positive behavioral changes to other sexual partners such as steady, non-commercial partners (e.g., spouses, boyfriends). Studies often focus solely on clients as FSWs' risky sexual partners, ignoring the possible risks FSWs face from steady sex partners.⁴ Thus, further research is needed identifying strategies to reduce the potential increased risk of HIV/STI transmission between FSWs and their steady partners.

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HIV/STI prevalence among FSWs along the Mexico-U.S. border

A recent estimate of HIV prevalence among all adults in Mexico put it at about 0.3%.⁵ HIV prevalence among FSWs in Tijuana and Ciudad Juarez is substantially higher and has been steadily rising over the past two decades. In the 1990s, HIV prevalence among FSWs in Tijuana and Ciudad Juarez was estimated at 1%, while by 2006 it had risen to 6%.⁶ Meanwhile, STI prevalence among FSWs in Mexico has been consistently high. In a 1995 study of FSWs in Mexico City, prevalence of active syphilis was 23.7%, of gonorrhea 11.6%, and of Chlamydia 12.8%.⁷ In a 2006 study of FSWs in Tijuana and Ciudad Juarez, the prevalences of acute syphilis, gonorrhea, and Chlamydia were 14%, 6%, and 13%, respectively.⁸

In response to the high rates of HIV and STIs observed among FSWs along the Mexico–U.S. border, Patterson et al.² conducted a social cognitive theory-based behavioral intervention (*Mujer Segura*, or “Healthy Woman”) designed to promote condom use with clients among FSWs in Tijuana and Ciudad Juarez. Although pilot study results indicated that almost half of the FSWs had a spouse or steady partner ($n = 40$, 49%) and that consistent condom use with these intimate partners was very low,⁹ the intervention did not specifically promote condom use with regular intimate partners.¹⁰ The intervention used motivational interviewing to elicit reasons for practicing safer sex and social-cognitive strategies to increase FSWs' knowledge, self-efficacy, and outcome expectancies regarding condom use with clients.¹⁰ In a randomized clinical trial, the intervention reduced FSWs' HIV/STI incidence by 40% compared to controls, while both groups showed increases in number of protected sex acts with male clients.²

FSWs' condom use with clients and regular partners

Several studies in African countries,^{4, 11–14} China,^{15–19} other Asian countries,^{20–22} Latin America,^{23–26} Europe,²⁷ Australia,²⁸ and the U.S.²⁹ have shown that FSWs use condoms less frequently with their steady sex partners than with their clients. There is also an emerging literature documenting why FSWs' report different condom use practices among partner types, such as psychological distinctions between work and private lives,³⁰ feelings of trust and intimacy with steady partners,^{31,32} condom use being dependent on steady partner's decision, and fear that suggesting condoms with steady partners might be used as evidence of sex worker status.²¹ Unprotected sex with steady partners is a particular concern given that FSWs' steady partners may contribute more to FSWs' HIV/STI risk than clients do. For example, a study in Cotonou, Benin showed that HIV prevalence among FSWs' steady partners was two times higher than HIV prevalence among their clients (16.1% versus 8.4%, respectively).³³ Another study of clients and boyfriends of FSWs in Accra, Ghana,³⁴ showed similar results: HIV prevalence among FSWs' boyfriends was 32% versus 4.9% among clients of mobile-based FSWs and 15.8% among clients of home-based FSWs. Steady partners of FSWs may be particularly high-risk because of their high numbers of concurrent sex partners, very low condom use rates, injection drug use, and high HIV/STI prevalence.^{33,35,36} Therefore, steady partners may warrant more attention in HIV/STI prevention research with FSWs.

Current Study

The purpose of the current study was to examine whether the *Mujer Segura* intervention,² which successfully increased FSWs' condom use with clients, had the added benefit of increasing FSWs' condom use with their steady, non-commercial partners. If the *Mujer Segura* intervention were to increase FSWs' condom use across partner type, it could be a highly time- and cost-effective approach to comprehensive HIV/STI prevention among FSWs in the Mexico-U.S. border region. Conversely, if the intervention had no effect on

FSWs' condom use with steady partners, this would suggest the need to develop partner-specific HIV/STI prevention strategies in future interventions with FSWs in this region.

Method

Participants

The participants in this study were 362 FSWs in Tijuana and Ciudad Juarez, Mexico who were randomly assigned to the intervention arm of a behavioral intervention study to increase condom use with clients.^{2, 10} In Tijuana, sex work is tolerated only in the *Zona Roja* (red light district), and FSWs must be at least 18 years old to obtain the required municipal permit. By contrast, Ciudad Juarez does not require a permit, but it also restricts sex work to specific areas. Eligibility criteria for the intervention study were: being at least 18 years old; having traded sex for drugs, money, or other material goods within the previous 2 months; and having had unprotected vaginal or anal sex with at least one client in the previous 2 months. Because the primary outcome variable of the *Mujer Segura* study was HIV seroprevalence, FSWs who either knew they were positive for HIV or who tested positive at screening were excluded. The current analysis used data from FSWs in the intervention condition who completed both baseline and 6-month follow-up interviews ($n = 362$). For the initial analysis, which compared FSWs who had a steady partner at both baseline and follow-up with those who did not, the full sample was used. (The second group included women who had a steady partner at either baseline or follow-up, but not at both, and women who had a steady partner at neither assessment point.) For the analysis of the intervention's effectiveness in increasing condom use with steady partners, we used data only from the first group ($n = 80$).

Procedure

Full details of the intervention study are available in previous publications.^{2, 9, 10} Participants for *Mujer Segura* were recruited through street outreach, community and municipal health clinics, and referrals from FSWs already enrolled in the study. Interviews were conducted at baseline and at six-month follow-up by trained counselors between January 2004 and March 2006. Participants also provided a blood draw and cervical swab and received \$30 U.S. dollars compensation at both visits. The study protocol was approved by Institutional Review Boards in San Diego, Tijuana, and Ciudad Juarez.

Eligible FSWs were randomized into either the intervention or control group. The intervention utilized motivational interviewing techniques and social-cognitive strategies to increase FSWs' knowledge, self-efficacy, and outcome expectancies regarding safer sexual behavior with clients. The control group received a standardized HIV and STI prevention curriculum based upon materials published by the U.S. Centers for Disease Control and Prevention³⁷ and by Mexico's National Center for AIDS Studies.³⁸ The intervention and control groups were equivalent in time, and both were administered in person and individually by trained counselors.

Measures

Demographic Characteristics—Participants were asked about their age, education, length of time as a sex worker, relationship status, whether or not they have children, and sources of income.

Injection Drug Use—Injection drug use was assessed by asking participants whether they had ever injected drugs. If they answered “yes,” they were then asked to indicate when they last injected drugs.

Unprotected Sex—Participants were asked at both baseline and six-month follow-up to report the number of times they had engaged in vaginal sex with clients and with steady partners in the past month. For each partner type, participants were asked to report the number of acts that had been unprotected. The same questions were asked regarding anal sex. Unprotected oral sex was excluded due to its lower risk and the fact that it frequently occurs in conjunction with vaginal and anal sex.³⁹ Unprotected sex ratios were calculated for each partner type in the past month by dividing the total number of unprotected sex acts by the total number of sex acts.

HIV and STI Testing—Blood samples were obtained from participants at both baseline and follow-up. HIV serostatus was assessed by The Determine rapid HIV antibody test (Abbott Laboratories, Abbott Park, Illinois, USA). Initial positive HIV test results were confirmed using enzyme immunoassay and Western blot. Syphilis antibodies were assessed using the Macro-Vue rapid plasma regain test (Becton Dickinson, Franklin Lakes, New Jersey, USA). Reactive samples were confirmed using a *Treponema pallidum* haemagglutinin assay (Fujirebio Diagnostics Inc., Malvern, Pennsylvania, USA). Rapid plasma regain titers 1:8 and greater were considered to indicate active syphilis infection. *Neisseria gonorrhoeae* and *Chlamydia trachomatis* were tested via cervical swabs using the APTIMA Combo-2 collection device (Gen-Probe, San Diego, California, USA).

Confirmatory HIV and STI tests were conducted at county health department laboratories in either San Diego (for Tijuana samples) or El Paso (for Ciudad Juarez samples). Pre- and post-test counseling were provided. FSWs who tested positive for HIV or any STI were referred to municipal health clinics for free, state-supported medical care.

Data Analysis

Initial statistical analyses examined baseline differences in demographics and HIV/STI results between FSWs who had a steady partner at both baseline and follow-up ($n = 80$) and FSWs who did not ($n = 282$). Wilcoxon tests were used for continuous data, while Fisher exact or chi-square tests were used for categorical data. Next, repeated measures negative binomial regression via Generalized Estimating Equations (GEE) was used to assess the partner type (steady partner vs. clients) effect on FSWs' condom use across time (baseline versus 6-month follow-up) utilizing data only from the women who had a steady partner at both baseline and follow-up ($n = 80$). Since differences in study site, length of time as a sex worker, and lifetime injection drug use could conceivably confound the results, we controlled for these variables in the model.

Results

Of the 362 FSWs in this sample, 52% ($n = 188$) lived in Tijuana, and 48% ($n = 174$) lived in Ciudad Juarez. Fewer women in Tijuana reported having a steady partner at baseline and follow-up than women in Ciudad Juarez (42% versus 58%, respectively). The mean age was 33.9 years ($SD = 9.4$); mean years of education was 6.0 ($SD = 3.3$); and the majority of FSWs had children ($n = 332$, 92%; mean number of children = 2.9). The average length of time as a sex worker was 7.4 years ($SD = 7.3$ years), and the mean number of male clients in the six months prior to baseline was 346.5 ($SD = 327.4$; median = 245.5). For injection drug use, 18% ($n = 66$) reported ever injecting illegal drugs, and 11% ($n = 40$) reported injecting drugs in the past 6 months. Eighty FSWs had a steady partner at both baseline and follow-up, 48 reported having one at baseline but not follow-up, 52 reported having a steady partner at follow-up but not baseline, and 182 reported no steady partner at either baseline or follow-up. We collapsed these four groups into two: FSWs who had a steady partner at both baseline and follow-up ($n = 80$) and those who did not ($n = 282$). There were no significant

differences in demographic characteristics or baseline HIV/STI results between women who had a steady partner at both time points and those who did not (see Table 1).

Next, among women in the first group ($n = 80$), we examined rates of unprotected sex with clients and steady partners at baseline and follow-up (see Table 2). The ratio of unprotected sex acts (vaginal and anal) to total sex acts (vaginal and anal) in the past month with a steady partner was 0.90 ($SD = 0.20$) at baseline, and 0.90 ($SD = 0.30$) at 6-month follow-up. The ratio of unprotected sex acts (vaginal and anal) to total sex acts (vaginal and anal) in the past month with clients was 0.42 ($SD = 0.28$) at baseline and 0.18 ($SD = 0.25$) at 6-month follow-up.

In order to examine the effect of the intervention on unprotected sex over time by partner type (steady partner versus client), we conducted a negative binomial regression for correlated data with the unprotected sex ratio as the outcome and time (baseline, six-month follow-up) and partner type as within-subject effects, controlling for site, ever injecting drugs, and number of years in sex work. The interaction between time and partner type was of main interest, and so we included it in our model (see Table 3). The interaction between partner type and time was significant ($OR = 0.47$, 95% $CI = 0.34-0.65$, $p < .001$), indicating that the rate of unprotected sex that FSWs had with their clients at baseline was 2.23 times higher than the corresponding rate at follow-up, whereas the rate of unprotected sex that the FSWs had with their steady partner at baseline was only 1.05 times (2.23×0.474) higher than the corresponding rate at follow up (see Figure 1).

Discussion

Our results are consistent with those of previous research among FSWs in several regions,^{4, 19, 23} in that FSWs in this study were significantly more likely to have unprotected sex with their steady partners than with their clients. In addition, results indicated that the *Mujer Segura* intervention did not decrease FSWs' unprotected sex with steady partners, although it did decrease unprotected sex with clients. Similar results were obtained by studies among FSWs in the West African country of Benin and Zimbabwe, in which condom use with steady partners remained consistently lower than with clients, even when condom use improved overall.^{40,41} However, other interventions among FSWs have been successful in simultaneously increasing condom use among clients and steady partners.^{14, 42} Future HIV prevention interventions targeting FSWs may want to address condom use with steady partners as well as clients in order to maximize protection against HIV/AIDS. Researchers should consider extending the definition of high-risk relationships to include spouses and boyfriends as well as clients and casual partners in order to raise FSWs' awareness of risk through multiple partnerships.^{12, 43} In addition, further research is needed among FSWs in Mexico examining how condom use changes as a function of increased perceptions of intimacy with new clients, regular clients, and steady partners. Prior research among FSWs has shown that intimacy functions on a continuum^{17,42} and that the distinctions between commercial and non-commercial partners may be unclear or change over time.^{4,44}

There are a few possibilities why FSWs use condoms less frequently with steady partners than with clients. First, not using condoms with steady partners may serve as a psychological distinction between personal and work life for some FSWs.³⁰ Studies assessing FSWs' reasons for not using condoms often cite "trust" and "feelings of intimacy" as the primary reasons for lack of condom use with steady partners versus clients.³¹ In a systematic review of condom promotion interventions in sub-Saharan Africa and Asia, Foss et al.⁴⁵ noted that behavioral HIV prevention interventions have been more effective for sex workers than for other women, since sex workers are likely to view sexual activity as a

business transaction, whereas women who are not sex workers (and sex workers themselves outside the context of their work) may view sexual activity as a reflection of intimacy, trust, relationship bonding, power, or reproductive intentions.³² Therefore, careful consideration of FSWs' attitudes towards being "told" to use condoms with their partners should be carefully considered when designing and implementing interventions targeting FSWs and their steady partners. Nonetheless, there have been promising couples-based HIV prevention interventions that have successfully increased condom use among married and partnered women in their primary sexual relationships.^{32,46,47}

For Mexican FSWs, the ability to negotiate condom use may be affected by traditional gender norms, more so within personal romantic relationships than in work relationships. Focus groups among FSWs in Mexico City³⁰ illustrated the existence of a dual "saint-whore" identity in FSWs' family and work lives stemming from archetypal Mexican female roles of the Virgin of Guadalupe and *La Malinche* (an Aztec woman who served as translator between the Spanish and indigenous people of Mexico, who is seen as a traitor because she was also Hernán Cortéz's mistress, see Paz and Santi [2000]⁴⁸). The traditional Mexican female role is defined by the values of purity, passivity, and subjection to men; such women are seen as mothers and not as sexual individuals ("the saint"). The sex worker role ("the whore"), by contrast, is more active and sexually assertive; sex workers typically decide what sex acts they will perform with clients and how much they will charge for them. FSWs in the Castañeda, et al.³⁰ study openly stated that they do not use condoms with their steady partners because they view condoms as symbolic barriers to intimacy, love, and feelings of connectedness, and as a way of distinguishing between their work and family lives. In addition, FSWs may fear losing the support (emotional, financial, or both) that they receive from their steady partners if they challenge their partners' desire not to use condoms. The current study did not measure Mexican cultural norms regarding sexuality or condom negotiation, but doing so in future studies may provide important information about how traditional gender-role beliefs affect FSWs' condom use with their steady partners.

Limitations

This was a post-hoc analysis of an intervention that was not originally designed to address condom use by partner type. Ideally, the effects of the *Mujer Segura* intervention would have generalized to condom use with steady partners; however, this intervention was designed to address only paid partners. Second, the results of this study may not generalize to FSWs of other cultures, which may have different gender-role socialization and sociocultural factors that influence condom use decisions. Also, we did not ask the FSWs in our study if they were currently trying to get pregnant which could potentially affect their condom use with steady partners. However, 93% of the FSWs in our study have children, and the mean number of children for this sample was 2.9. Therefore, the actual number of FSWs actively trying to get pregnant may have been low. Finally, the participants in this study were a convenience sample of high-risk FSWs from Tijuana and Ciudad Juarez whose experiences may not be representative of FSWs in other cities or of FSWs in the Mexico-U.S. border region as a whole. Therefore, caution should be exercised in generalizing the results of this study to other FSW populations.

Conclusions

HIV prevention interventions for FSWs have generally focused on clients rather than on non-commercial intimate relationships as a unit of change and analysis, thus neglecting the important role steady partners can play in HIV/STI risk among FSWs. Future HIV/STI prevention interventions for FSWs should address HIV/STI risk from steady partners, stressing the importance of consistent condom use across partner types. The results of this study highlight the need for specialized prevention materials and intervention strategies that

address HIV/STI risk between FSWs and their steady partners. Also, efforts to engage FSWs' steady partners in HIV/STI prevention are needed to determine whether individual or couple-based approaches would be most appropriate. Including partners in interventions may improve condom use norms within FSWs' social networks,⁴⁹ facilitate condom use negotiation within FSWs' intimate relationships, and improve FSWs' self-efficacy to use condoms in those relationships. At a minimum, there is an urgent need to raise FSWs' awareness regarding the potential HIV/STI risk from steady partners, and definitions of high-risk partners should expand to include steady, non-commercial partners.

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Figure 1.
Rate of unprotected sex by partner type across time

Table 1

Descriptive Statistics of FSWs by Partner Status

	Steady Partner ^a (<i>n</i> = 80)	No Steady Partner ^b (<i>n</i> = 282)	Total (<i>N</i> = 362)	<i>p</i> -value
Background Characteristics				
Interview location				.06
Tijuana	34 (42%)	154 (55%)	188 (52%)	
Ciudad Juarez	46 (58%)	128 (45%)	174 (48%)	
Mean age	33.3 (<i>sd</i> = 8.1)	34.1 (<i>sd</i> = 9.7)	33.9 (<i>sd</i> = 9.4)	.77
Mean years of school completed	6.3 (<i>sd</i> = 3.5)	5.9 (<i>sd</i> = 3.3)	6.0 (<i>sd</i> = 3.3)	.51
Has children	73 (91%)	259 (93%)	332 (92%)	.81
Mean years in sex trade	7.8 (<i>sd</i> = 7.3)	7.2 (<i>sd</i> = 7.3)	7.4 (<i>sd</i> = 7.3)	.48
Mean number of male clients in past 6 months	369.0 (<i>sd</i> = 350.7)	340.1 (<i>sd</i> = 320.9)	346.5 (<i>sd</i> = 327.4)	.80
Main source of income prostitution	80 (100%)	276 (98%)	356 (99%)	.59
Ever injected drugs	19 (24%)	47 (17%)	66 (18%)	.19
Injected drugs in the past 6 months	13 (16%)	27 (10%)	40 (11%)	.11
HIV/STIs results baseline				
HIV positive	5 (6%)	15 (5%)	20 (6%)	.78
Syphilis titer 1:8	22 (28%)	42 (15%)	64 (18%)	.01
Chlamydia positive	7 (11%)	30 (13%)	37 (13%)	.83
Gonorrhea positive	4 (7%)	16 (7%)	20 (7%)	1.0

Note. Data are number (%) of women, unless otherwise indicated. Some frequencies do not sum to *n* due to missing values.

^aFSWs who had a steady partner at both baseline and follow-up

^bFSWs who did not have a steady partner at either baseline or follow-up (*n* = 182), had a steady partner at baseline but not follow-up (*n* = 48), or had a steady partner at follow-up but not baseline (*n* = 52)

Table 2

Unprotected vaginal and anal sex at baseline and follow-up by partner type

	Baseline	Follow-up
Steady partner		
Mean number of sex acts with steady partner, past month	27.7 (<i>SD</i> = 36.2)	29.8 (<i>SD</i> = 36.2)
Mean number unprotected sex acts with steady partner, past month	24.1 (<i>SD</i> = 31.1)	27.8 (<i>SD</i> = 50.5)
Ratio of unprotected sex acts to total number sex acts with steady partner, past month	0.90 (<i>SD</i> = 0.20)	0.90 (<i>SD</i> = 0.30)
Clients		
Mean number of sex acts with clients, past month	86.6 (<i>SD</i> = 85.2)	77.4 (<i>SD</i> = 99.6)
Mean number unprotected sex acts with clients, past month	32.3 (<i>SD</i> = 48.1)	14.5 (<i>SD</i> = 36.6)
Ratio of unprotected sex acts to total number sex acts with clients, past month	0.42 (<i>SD</i> = 0.28)	0.18 (<i>SD</i> = 0.25)

Table 3

Multivariate model for unprotected vaginal and anal sex with steady partners versus clients across time

Variable	Rate Ratio	SE	95% CI	<i>p</i>
Partner Type ^a	4.69	0.77	[3.41, 6.47]	<.001
Time ^b	2.23	0.35	[1.64, 3.02]	<.001
Site ^c	1.28	0.13	[1.06, 1.56]	.01
Ever injected drugs	1.27	0.14	[1.02, 1.58]	.03
Number of years in sex work	1.02	0.01	[1.00, 1.03]	.01
Time × Partner Type	0.47	0.08	[0.34, 0.65]	<.001

Note. *SE* = standard error; CI = confidence interval.^aSteady partners versus clients^bBaseline versus 6-month follow-up^cTijuana versus Ciudad Juarez