HIV Testing and Engagement in Care among Highly Vulnerable Female Sex Workers: Implications for Treatment as Prevention Models

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Abstract

Background—Although emerging Treatment as Prevention models can be effective in reducing HIV incidence among high-risk populations, many HIV infected individuals remain undiagnosed or fail to engage in HIV care.

Methods—This study examined the factors associated with HIV testing and care among a population of substance using female sex workers.

Results—Recent HIV testing was associated with higher education level, having a regular health care provider or clinic, recent crack use, and higher sexual risk behaviors; HIV treatment utilization was associated with higher levels of social support, having a regular health care provider or clinic, housing stability and insurance coverage. Qualitative data revealed HIV-related stigma, denial, social isolation, and substance use as barriers to HIV testing and treatment; social support and accessibility of services were key enablers.

Conclusions—Improving HIV testing and linkage to treatment among female sex workers will require structural initiatives to reduce stigma and increase service seeking support.

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Keywords

HIV testing; HIV prevention; HIV treatment; female sex workers; barriers

In the wake of recently completed clinical trials, Treatment as Prevention (TasP) approaches are emerging as powerful tools for HIV prevention.[1–3] The early identification of HIV infection and timely initiation of antiretroviral therapy are key components of "test and treat" strategies,[4] which are capable of effecting dramatic reductions in HIV incidence if rigorously implemented.[5, 6] Presently, however, it is estimated that as many as 60% of HIV infected individuals in the United States are not receiving regular HIV care because of deficits in diagnosis, linkage to care, or retention in care.[7] As such, a comprehensive understanding of the barriers to HIV testing and care is critical in the way forward for biomedical prevention initiatives.[8]

In order to achieve maximum impact on the HIV epidemic, it has been suggested that TasP initiatives be targeted to those most at risk of acquiring and transmitting HIV infection; in particular, individuals with high numbers of sex partners have been identified as a key population for implementation.[1, 2] Female sex workers are one population at high risk for acquisition and transmission of HIV due to concurrent sexual partnerships and risky sexual practices.[9–15] Street-based female sex workers are particularly vulnerable to HIV infection given their limited power to negotiate sexual encounters,[16] and are simultaneously confronted with numerous barriers that limit utilization of health services, including substance use, homelessness, low socioeconomic resources, social isolation, victimization, and psychological problems.[17–22] Although little is known regarding the specific factors that affect utilization of HIV-related services among street-based female sex workers in the U.S.,[18] data from international studies indicate that stigma, discrimination, and denial of risk are particularly salient barriers to testing in many locations, along with lack of knowledge and access to HIV testing services.[19, 23–26]

Female sex workers in the United States are an understudied population,[27] and so, critical information on uptake of HIV testing and care is generally unavailable, as are prevalence and incidence data on HIV infection among this group.[14, 28, 29] International research on voluntary counseling and testing services for female sex workers has widely documented low uptake of HIV testing among this group, with approximately 20% to 50% reporting prior HIV testing.[19, 23–26] Although data on HIV treatment utilization are even more limited, one recent study among female sex workers in Rwanda indicated that just 63% of the HIV infected were linked to care.[30] In the U.S., prior research in South Florida has documented an HIV prevalence of 25% among street-based African American female sex workers,[14] nearly half of whom were undiagnosed prior to the study due to low utilization of routine HIV testing services.[18] Therefore, female sex workers appear to display significant gaps at each stage of the HIV continuum of care,[31] from diagnosis, to enrollment and retention in care, to viral suppression. Because the success of TasP initiatives rests upon attaining high rates of testing and treatment compliance,[2] primary challenges for the scale-up of such efforts among vulnerable female sex workers will be to reduce HIV testing barriers and improve linkages to care for early treatment.

The overall aim of this paper was to examine the factors associated with recent HIV testing and HIV treatment utilization among a sample of street-based African American female sex workers in Miami, Florida. We used a mixed methods approach to elicit information on the key barriers and supports for HIV testing, with the goal of identifying targets for intervention to increase HIV testing frequency among this population. Going further, we examined the impediments and supports for HIV care among seropositive female sex workers, which are critical to address in order to achieve the full benefits of antiretroviral therapy and reduce further transmission of HIV.

Methods

Study description

The data were drawn from a randomized clinical trial designed to test the relative effectiveness of two case management intervention protocols in linking underserved women with health and social services and reducing risk behaviors for HIV. The study was guided by the Behavioral Model of Health Services Utilization (BMHSU), a widely used conceptual model for examining health services utilization.[32–34] Its utility has been documented in predicting a variety of health services utilization behaviors such as HIV testing[35] and substance abuse treatment entry[36] among vulnerable populations. The three overarching domains of the BMHSU are predisposing, enabling, and need factors. The model suggests that the use of health services is a result of: 1) the predisposition of the individual to use services, 2) the person's ability to obtain services, and 3) the person's illness level or the urgency or perceived need for services.

Target population and study eligibility

The target population for this intervention trial was drug-using, African American female sex workers in Miami, Florida. Study inclusion was limited to African American women based on prior studies with sex workers in the Miami area, which indicated that African Americans were two times more likely than sex workers of other racial/ethnic groups to test HIV-positive.[37] Eligible clients were African American women ages 18 to 50 who had: a) traded sex for money or drugs at least three times in the past 30 days; and, b) used cocaine, crack, or heroin three or more times a week in the past 30 days.

Study recruitment

Participants in the study were recruited using targeted sampling strategies.[38] Targeted sampling is a systematic sampling method by which specified populations within geographical districts are identified, and detailed plans are constructed to recruit specified numbers of individuals within each of the target areas. For the present study, initial recruitment efforts centered on the primary street sex work solicitation areas to the north of downtown Miami, along the main thoroughfares of Biscayne Boulevard, 79th Street, and Miami Avenue.

Recruitment was carried out by a team comprised of both professional outreach workers and active sex workers. The outreach staff was indigenous to the target recruitment areas, and several members of the team had prior experience conducting outreach for local community

service agencies. Female outreach teams recruited from different sections of the primary sex work strolls on an at least weekly basis. In addition, the use of active sex workers as recruiters provided routine access to many secondary solicitation locations where potential participants were located.

Study procedures

Study recruiters made contact with potential participants in various street locations. Potential participants were asked to contact the field office for telephone screening for eligibility. Those meeting project eligibility requirements were scheduled for appointments at the project intervention center, where they were re-screened on arrival. After eligibility was confirmed, informed consent was obtained, followed by a structured face-to-face baseline interview lasting approximately one hour. Participants were paid a $25 stipend upon completion of the baseline interview. All participants also received a hygiene kit containing a variety of risk reduction materials. Project staff completed the requirements for National Institutes of Health (NIH) web-based certification for protection of human subjects. Study protocols were approved by the University of Delaware (predecessor institution) and Nova Southeastern University (Ft. Lauderdale, Florida) Institutional Review Boards.

Data collection and measures

Interviews were conducted face-to-face using computer-assisted personal interviews (CAPI). The Global Appraisal of Individual Needs (GAIN, v. 5.4[39]) was the primary component of the standardized baseline assessment. This instrument captured demographic information on predisposing, enabling, and need factors specified by the BMHSU model, including demographics, environment, physical and mental health status, homelessness, violence and victimization, HIV testing and serostatus, treatment history, as well as lifetime and 90-day measures of drug use frequency and sexual risk behaviors.

Participants' HIV status was determined by self-reported response to the item, "What was the result of your last HIV test?" Based on this response, seronegative/serounaware participants were included in the HIV testing analyses, and seropositives in the HIV treatment analyses.

Dependent variables

The outcome measures in this analysis were: 1) participation in recent HIV testing for seronegative or serounaware participants; and, 2) engagement in HIV treatment for seropositive participants.

HIV testing—All participants were asked a single item "When was your last HIV test for which you received the results?" We calculated the time elapsed since the last HIV test relative to the baseline interview, and dichotomized the resulting variable as *HIV tested in the prior six months*, yes or no. We examined testing during the past six-month period, given that frequent testing would be required to implement effective TasP strategies among high risk populations.[5]

HIV treatment—Participants who reported a positive test for HIV were asked "Are you currently receiving medical care for your HIV infection?" This is a dichotomous variable, with 1 indicating yes, and 0 indicating no.

Independent variables

The primary independent variables were predisposing, enabling, and need factors as described by the BMHSU.[32–34]

Predisposing factors

HIV testing—Within the BMHSU framework, predisposing factors are pre-existing individual characteristics hypothesized to affect services utilization. We examined age, education, substance use, and housing status as predisposing characteristics that might affect utilization of HIV testing services.

HIV treatment—For seropositive women, we also examined current sexual risk behaviors as predisposing characteristics that may influence HIV care utilization.

Enabling factors

HIV testing and care are also likely to be influenced by enabling factors. These include economic and social resources that affect access to care. We examined income, health insurance, contacts with the health care system, and social support as potential enabling factors of HIV testing and treatment services. Social support was measured using the 19-item MOS Social Support Survey,[40] which includes the domains of emotional/informational support, tangible support, affectionate support, and positive social interaction. Scores were calculated according to the scale's authors' guidelines, and were transformed to a 0–100 scale for comparison to published means. Cronbach's alpha for overall social support in this sample was .966.

Need factors

HIV testing—Finally, we examined need factors related to illness level or the urgency for services. In this connection, we examined past 90-day physical health problems, sexual risk behaviors and sexual victimization, past year STI diagnosis, and perceived risk for HIV infection as factors that would directly affect participants' perceived need to use HIV testing services. These need factors have been used in prior research examining HIV testing among vulnerable women within the BMHSU framework.[35] Perceived risk for HIV was measured among sero-negative/unaware participants by response to the item, "Which of the following best describes the likelihood that you will get HIV infection at some time in the future?" Response choices were a four-point Likert scale ranging from "no chance" to "very likely".

HIV treatment—For HIV treatment engagement, we examined past 90-day physical health problems and past year STI diagnosis as factors that might affect participants' perceived need to initiate HIV care.

Qualitative data collection

In order to contextualize the questionnaire data we collected on HIV testing and treatment engagement, we conducted seven focus groups with a total of 21 women in July and August 2010. We sought a diversity of experiences and perspectives for the groups and, so, women were selected based on their questionnaire responses to the HIV status item, as well as their reported participation in recent HIV care or HIV testing. Women were contacted and invited to the group after their participation in the main study was complete, in order not to bias their responses to the questionnaires.

The group participants ranged in age from 20 to 54, and included 12 HIV− and nine HIV+ women. Half of the HIV− women reported recent testing; two-thirds of the HIV+ women reported being in current care. HIV− and HIV+ women participated in separate groups, which were aimed at understanding the barriers to HIV testing for seronegatives, and barriers to HIV treatment among marginalized seropositive women. Groups were conducted by two female members of the research team, including the study director and one additional staff member, and followed a semi-structured guide developed by the Principal Investigator. Focus groups averaged 60 to 90 minutes in length.

Data analysis

All quantitative analyses were conducted using SPSS version 20 [41]; only baseline data are reported here. Chi-square and t-tests examined differences in predisposing, enabling, and need factors across our outcome measures: HIV testing and HIV treatment. Significance level was set at $a = .05$ for all comparisons.

Three primary steps were taken to analyze the textual data elicited in the focus group sessions. These included: 1) initial *verbatim* transcription and verification of session audiotapes; 2) focused readings of these transcripts conducted independently by two members of the research team; and, 3) the application of detailed codes based on readings of the transcripts. Descriptive codes were independently applied to the transcripts by two research team members. This open coding technique produced a series of coding nodes, which reflected recurring patterns or themes in the data. Open coding of the transcripts followed a grounded theory approach.[42]

The analysis then focused on identifying the most prevalent barriers and supports for HIV testing and treatment among this sample of marginalized women. The most important dimension of the analysis phase was the comparison of codes across data sources to identify systematic patterns, that is, the extent to which findings in one focus group were either corroborated by or negated in subsequent groups. Themes that were endorsed in multiple data sources, and by multiple participants within a particular data source, were considered especially salient and noteworthy in this descriptive analysis. We continued the groups and iterative analysis until saturation was achieved, that is, when there was a redundancy of thematic information present in the data.

Results

Table 1 displays the results of the descriptive analyses examining HIV testing utilization in the prior six months. Among predisposing factors, having at least a high school education was associated with being recently tested for HIV (p=.05). With regard to substance use, those recently tested were *less* likely to be users of powder cocaine (p=.04); in contrast, recent testers were *more* likely to report use of crack-cocaine (p<.01). Heroin use was not associated with HIV testing in the prior six months (p=.19).

As for enabling factors, health care contacts were strongly associated with receipt of recent HIV testing. Participants who reported obtaining an HIV test within the prior six months were significantly more likely than non-tested women to have a regular health care provider or clinic (p<0.01). Other enabling factors demonstrated no significant association with recency of HIV testing, including recent treatment in the emergency room (p=0.19), having health insurance (p=0.74), income level (p=0.76), and social support (p=.49).

Several need factors were significantly associated with recent HIV testing. In terms of sexual risk behaviors, higher numbers of recent sexual contacts were found among recent testers compared to non-testers (121.4 *vs*. 89.2 times, p=.02). There were no significant associations between HIV test recency and number of recent unprotected vaginal sexual contacts (p=.78) nor numbers of paying male sexual partners (p=.88). Among women who reported HIV testing in the prior six months, a higher proportion reported having been sexually assaulted (10.9% *vs*. 5.8%; p=.055), compared with those not tested. There was no significant association between past year STI diagnosis and recent HIV testing (p=.83). Perceived risk of acquiring HIV infection showed a trend associated with HIV testing: women who were recently tested were more likely to report little or no chance of future HIV infection (70.3% *vs*. 61.8%; p=.06) compared with women who were not tested.

Table 2 presents the results of the descriptive analyses examining participation in HIV treatment among seropositive participants. Among the predisposing factors, recent homelessness was strongly associated with treatment status. The prevalence of recent homelessness was 56.5% among women who were not in care for HIV, compared with 25.3% among those engaged in care (p<.01). In terms of sexual risk behaviors, women not involved in HIV treatment reported a higher number of paying male partners in the past 90 days (30.1 *versus* those currently participating in HIV treatment (11.5, p=.04). In addition, among women who were not in care for HIV, a higher proportion reported recent sexual assault (26.1% *vs*. 9.3%; p=.04) compared with those in care. There was no significant difference in HIV treatment engagement based on age, education level, or substance use status.

With respect to enabling factors, several items distinguished those receiving HIV treatment from those who were not. Those receiving HIV treatment were more likely to report having a regular health care provider or clinic (98.7% *vs*. 60.9%; p<.01) compared with participants not receiving HIV care. Health insurance was also significantly associated with participation in HIV treatment, with 77.3% of those in care reporting current health insurance *versus* 18.2% of those not in care (p<.01). Social support also predicted engagement in HIV care;

women in care reported significantly higher social support than those not engaged in care (p<.01). In general, need factors were not associated with participation in HIV treatment, including experiencing health problems in the past 90 days.

Qualitative findings

Analysis of the focus group data revealed four primary themes as barriers to HIV testing and treatment, including HIV-related stigma, denial/fear, isolation and hopelessness, and substance use.

Stigma—The most prevalent barrier to HIV testing and treatment identified in the focus group data centered on powerful predisposing beliefs about HIV as a stigmatizing condition. HIV infected sex workers tended to reflect on their initial diagnosis, reporting significant worry and anxiety about the negative reactions of others who would likely learn of their status. In some cases, these concerns were managed or overcome in the short-term, while for others they were long-standing:

> I found out because I was pregnant with my daughter and I remember that impression I got in like, "Oh, God, my life is over with. I'm gonna die." They don't want to know because they're scared. And the stigma. The category they can be placed in. Oh, God, who gonna know about me?

> In the beginning when the doctors told me that I had to take medication, it took me three months because I didn't want no one to see me going to get my medicine. I didn't want nobody to see how many pills I had to take. I didn't… it's just the whole idea. It was just more the embarrassment to me.

> People be scared of somebody "Oh, my friend, he gonna know I got it," or who gonna know they have it. Because how they talk about it, for one thing. How people, how they talk about HIV like you gonna die the next day.

Denial/fear—For many participants the significant stigma associated with HIV infection created conditions that engendered denial, fear, and a sense that one was better off not knowing their status. In this regard, HIV negative sex workers spoke largely about fear associated with testing that prevents uptake even when available:

> I seen in the Miami Times, they had a red map in the Black community. We are the highest that's getting this disease. The sad part about it is, people go around and offer free tests. People choose not to go because of their ignorance or because everybody don't want to know.

Similarly, for HIV infected women, there was pervasive fear associated with seeking available services that led to extended periods of treatment avoidance and disease progression:

> A lot of times you just afraid, just afraid to even get out there, let anybody even know that you have the disease or anything like that. You don't want to talk to nobody about it. That's the way I was. I was just in denial. And I was very sick and

in denial. I just was afraid, I'm getting ready to die and then I'm sitting there like a fool, won't even go to the doctor to get treated. That's how afraid I was.

Well, I'm supposed to be taking medication, but I haven't been. It's been about, maybe six years. I was too busy running the streets, so I didn't want to face it or accept it.

Isolation and hopelessness—The harsh realities of street life, including unsafe and unstable living conditions, also evoked intense feelings of isolation and hopelessness, which further impeded motivation and action to seek or use HIV testing and treatment. Several quotations from different women illustrate this:

If you already feel down and depressed, it's like, what should it matter if I have it or not? My life is already crap, so why should I go get tested? I'm already living on the street, so I might as well die anyway.

I'm homeless on the street. I stay in my little box because I don't want to be around people. I don't want to socialize. And I don't want nobody to know, but you can't help but know by looking at me, especially now. I look like the walking dead.

I've been on the street for so long, I hate to say it, but you get comfortable. And I just like, I had no desire, no strength to fight for me no more.

Substance use—Substance abuse also represented a significant barrier to both HIV testing and treatment utilization among this sample, summed up by one woman who aptly noted, "the drugs have you consumed and you lose care of your whole self." In this regard, patterns of chronic drug use increased risk for HIV infection, but at the same time hindered diagnosis and treatment:

But like I, my last run, I was like 10 months in a car. I slept in a car for 10 months doing all the things that I wasn't supposed to be doing just to make, just to get my dope. That was, that, it was about getting my high. I didn't care nothing about no doctor, I don't want to see no doctor…don't come to me if you ain't got no dope. That was my main thing.

When you want to get high, you not worrying about, you know, if a john is clean or not. You're worried about getting his money and going to get your next hit. So even after you come down, you gonna, still might not be worried about going to get, you know, tested.

Interestingly, for some women, risky behaviors increased their desire for testing, based on a felt need:

The drugs you doing, the sex with different men make you want to get tested. Different men you sleep with for drugs and monies make you want to get tested more and more.

Despite these challenges, many women also spoke about enabling factors that would support their HIV service seeking. We identified two primary themes related to support for HIV

testing and treatment. Shown below, these included social support/supportive environments and increased access to services.

Social support/supportive environments—Participants frequently mentioned the importance of supportive, caring, and confidential environments to motivate HIV testing:

> Getting information that I needed would help me to want to go get tested. Going through the classes and talking to the outreach worker, it helped me take away some of the fear that I had.

> I guess just wanting to know my status. You know, so, having a place that I feel safe to go where I don't have to worry about my business being put out in the streets, you know? And maybe having someone to talk to about, you know, how you contract it and things like that and having a place to go.

> I'm sitting in this group and this is what this is based on. It make me feel like that when I leave here, I need to go be checked out. As I get up and walk out y'all door, I want them to go check me right quick. Yeah, that's how I'm feeling.

HIV infected women also mentioned a significant effect of social support on their ability to seek and maintain treatment:

> I still deal with the issues and when I go in there somebody gonna know about my status, but that's just something that I have to deal with. You know? I don't go around and tell anyone that I'm positive, but I do go to support groups and that helped me come out my shell.

> I think if you get a good support system, somebody that you know you can go and tell what's wrong with you and they'll be there. If they don't hear from me that day, they call. If I don't answer the phone, they come knocking on my door. "What's wrong with you? How you feeling? What's going on?" Like that. You know? And they keep me on track.

Increased access to services—Tangible supports, such as incentives, mobile units, direct outreach, and integrated services during contacts with the health care system, also emerged as specific recommendations for increasing uptake of HIV testing among underserved female sex workers:

> They did, they had a mobile thing came there. They was giving away $50, I think a whistle, some condoms and some other little goodies. Boy, you should've seen the line.

> You go into a mobile unit, don't just have it just for the HIV, but just do like everybody else, do a blood pressure screen or something like that and people will just get their blood pressure taken, and they'll sneak right in and get the HIV.

> I think, outreach, of course, outreach have been, put them back in the community. They can go to the line where they have food at for free. It used to be out there, now a lot of stuff cut out. You got to go online and if you don't know nothing about computers, you kind of messed up. A lot of them changed.

The reason why I [tested]….I had to go to the hospital because I had a case of genital warts and that leads to, it can be a sign to HIV too. I had to get tested for Chlamydia, gonorrhea, syphilis, everything.

Now I haven't had a Pap smear in probably about the same time it's been since I got my last AIDS test, and I'm aware that's not good, but I have no medical insurance. You know, I would prefer to go to my private doctor to get an AIDS test because this is somebody who knows my history. But unfortunately, I don't have one. This is what our society is about. And I feel that a lot of doctors, because of lack of insurance, do not give you the same treatment that you would get if you had the cash to make sure they get paid.

Discussion

To our knowledge, the present study provides the first report of HIV testing and treatment barriers among highly vulnerable female sex workers in the U.S. Our findings indicate that street-based female sex workers confront a range of substantial challenges to HIV testing and treatment utilization; principally important in this regard are the structural factors of HIV-related stigma, housing instability, inadequate support systems, and constraints on access to services. These structural barriers appeared to be pervasive in the environmental context of the target population, affecting the uptake of HIV testing to some extent, and inhibiting treatment seeking among HIV infected sex workers to an even greater degree. In the future, understanding and ameliorating these barriers through behavioral and structural intervention efforts will be critical to the successful rollout of biomedical prevention initiatives among highly vulnerable populations of female sex workers.

Among women who were sero-negative or sero-unaware, past six month HIV testing prevalence reached 58%. Recent testing was associated with a felt need based on potential exposure, including recent sexual assault and higher numbers of recent sexual acts. In addition, the quantitative findings indicated that recent HIV testing was associated with health care access, including having a regular health care provider or health clinic. This point was echoed by several women in the focus groups, who expressed a desire for testing in more private locations, principally to avoid the stigma associated with visiting known HIV test sites. On a related point, many women emphasized the need for trust and confidentiality with respect to seeking HIV testing and/or care from a medical provider.

Of particular interest is the finding that those with high perceived risk of HIV infection tended to be less likely than others to report recent testing; this appears to be evidence that fear of HIV diagnosis is prevalent among this population, and resonates with the qualitative data indicating denial as a strong factor that negatively affects uptake of HIV testing. This association has been documented among female sex workers in international settings as well.[19] Clearly, fear of diagnosis and HIV-related stigma are widespread, significant barriers that must be addressed in order to increase the feasibility of TasP approaches with vulnerable female sex workers.

Among sero-positive sex workers, the prevalence reporting current HIV care was 77%; considering the unique and complex challenges faced by this group of women, this level of

linkage to current care is considerable. Among the enabling factors associated with HIV care were health insurance and having a regular health care provider or clinic. This is not particularly surprising as health care access provides the vehicle for acquisition of HIV medications; nevertheless, these data also indicate that nearly 36% of indigent HIV infected women lacked any type of health insurance coverage. This is a significant issue for enrollment in care and long-term retention in care.

Higher social support scores were present among those in HIV care than among those out of care. Although overall scores tended to be lower than national norms among patients with chronic illnesses,[40] supportive social networks did affect receipt of HIV care among this group of women. This resonated with the focus group findings, which identified social support as a key enabling factor for participating in consistent HIV care among the sample of seropositive women. Social support has previously been associated with positive health outcomes among people living with HIV,[43–49] however, for female sex workers with substance abuse issues, personal social networks are often a source of stress and trauma[9, 50, 51] rather than support. Structural interventions that target mechanisms for building positive social support and community solidarity among female sex workers would appear to be critical for improving HIV treatment enrollment and retention in care for this vulnerable population. International initiatives targeting sex worker empowerment through community–level organizing efforts have proven highly beneficial for HIV prevention efforts in many areas[52–56] and would appear to be a productive way forward here.

Importantly, HIV infected female sex workers not in care demonstrated increased vulnerabilities in terms of housing stability, recent sexual assault, and higher numbers of paying male sexual partners. These findings align with prior research demonstrating the impact of housing instability on increased risk for ARV adherence problems, lower viral suppression, and poorer health outcomes among HIV infected individuals.[57–59] In both the quantitative and qualitative data, housing instability emerged as an important barrier to accessing HIV care, and simultaneously engendered conditions that increased levels of sexual activity, both consensual and non-consensual. This is troublesome as HIV infected female sex workers in need are not receiving appropriate care, and untreated HIV infection is left to drive transmission through unprotected sexual contacts. The provision of housing assistance has previously been shown to reduce both sexual and drug-related risk for HIV transmission among vulnerable HIV infected individuals,[60] and has been identified as a promising structural level intervention in the fight against HIV.

Limitations

There are several important limitations regarding study data. First, although the study collected longitudinal information, this analysis used only baseline data. The focus was on understanding HIV testing and treatment uptake in a vulnerable population of female sex workers prior to study enrollment or intervention. Thus, our measures are at a single time point, which limits our ability to predict directionality in the associations we documented. In addition, our data on HIV testing, serostatus, and engagement in care were gathered through self-report; no biological testing or clinical record data were available to verify baseline self-reports. Thus, the data may be subject to reporting biases. Furthermore, the measurement of

some items was limited in terms of time period assessed, or relied on single items. We were unable to examine important aspects of HIV care utilization, such as consistency in care, length of time in care, or medication adherence levels. Finally, study participants were limited geographically to South Florida, which might affect generalizability of the results to other groups of female sex workers.

Recommendations

The HIV epidemic in the United States is concentrated among marginalized populations,[61] including the street-based African American female sex workers who participated in the present study. Many of these women do not have access to routine health care, but even among those who reported recent health care contacts, there appear to have been missed opportunities for HIV testing. Despite the CDC recommendation that HIV testing should take place in all health care settings,[62] our data revealed that neither treatment in emergency room settings, nor clinic-based diagnosis and treatment for STIs, was associated with recent HIV testing among this sample.

Providing HIV testing in a variety of health care settings assumes great importance among this high-risk group of female sex workers, given the powerful stigma associated with testing in high-visibility HIV clinic locations identified in the present study.

In fact, our findings suggest that even in a scenario of full access to HIV testing and treatment, HIV-related stigma impedes uptake of these services among vulnerable female sex workers. There is a clear need to involve this heavily affected population in the development of strategies to reduce stigma,[63] which can increase the acceptability and utilization of services necessary to scale up TasP approaches effectively.[64]

International research among vulnerable female sex workers has also recognized stigma as a critical structural barrier to HIV testing and service seeking.[56, 63] Lessons learned from these initiatives indicate that long-term empowerment-based intervention approaches emphasizing community-building and solidarity are key elements of both stigma reduction and HIV prevention among female sex workers. Empowerment perspectives highlight the importance of the participatory process as a mechanism for change. In this regard, participation in community-building interventions would provide a context in which women's personal capacities and experiences are validated and respected, and would present opportunities to enact new roles that contribute to self-respect, positive identity, and a sense of belonging,[65, 66] all of which are powerful incentives toward personal agency and social action.[66–69] Among our sample of highly vulnerable African American female sex workers, we argue that the lack of personal and social power is a primary driver of stigma, and contributes to low rates of HIV testing, and low uptake of HIV treatment. Addressing these issues will require an investment of resources into new models of intervention that are sustainable over time and require meaningful participation from multiple stakeholders; nevertheless, considering the potential cost savings and quality of life benefits that accrue from averting new HIV infections, the investment appears well worth making.

Clearly, our findings illustrate that many sex workers appreciated direct outreach efforts in the community and utilized existing mobile units for testing, albeit sporadically, especially

those that offered multiple health services where privacy was maintained. We believe that these data lend support to the value of such intensive outreach efforts for female sex workers who are largely disconnected from formal care systems. This appears to be particularly true for homeless or unstably-housed HIV infected female sex workers, who were less likely to be engaged in treatment and more active in the sex trade than their stably-housed counterparts. Intensifying community-based efforts to link HIV infected sex workers to available housing assistance would be a step forward in this regard, as this approach has been shown to successfully reduce onward HIV transmission risk among other marginalized HIV infected populations.[60] From a public health perspective, reducing HIV transmission in a sex work context may have considerable impact on the epidemic, and spending prevention monies on TasP initiatives for this population appears to be an efficient use of scarce resources.[2]

The lessons of this study can be usefully applied to combination HIV prevention approaches for vulnerable female sex workers in the U.S. in the future. Given the strong association between social support and uptake of HIV treatment documented here, intervention initiatives that encompass building supportive and empowering social networks among female sex workers may be particularly useful. Building on the voices and experiences of these women, it appears that interventions must involve a relational approach that aims to build psychological power, group solidarity, social support, and the capacity for agency and social action. These activities are critical in achieving health and wellness [70–72] among disenfranchised women. Effectively reaching this high-risk population may be one way to begin reducing the persistently high HIV incidence rate in the United States.

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Table 1

Predisposing, enabling and need factors of 457 HIV negative female sex workers

	Total (n=457)	Not HIV tested (n=191)	HIV tested last 6 mos. (n=266)	Sign.
Predisposing Factors				
Age, *mean (SD)*	38.7 (8.8)	39.1 (8.7)	38.4 (8.9)	0.38
High school education, *n (%)*	233 (51.0)	87 (45.5)	146 (54.9)	**0.05**
Homeless in past 90 days, *n (%)*	276 (59.5)	108 (55.4)	168 (62.5)	0.13
Substance use in past 90 days, *n (%)*				
Cocaine	286 (62.6)	130 (68.1)	156 (58.6)	**0.04**
Crack	310 (67.8)	115 (60.2)	195 (73.3)	**<0.01**
Heroin	35 (7.7)	11 (5.8)	24 (9.0)	0.19
Enabling Factors				
Income in past month[a], *n (%)*				
Less than $1000	166 (36.4)	68 (35.6)	98 (36.9)	0.76
$1000 or more	290 (63.6)	123 (64.4)	167 (63.1)	
Health insurance, *n (%)*	121 (26.5)	49 (25.7)	72 (27.1)	0.74
Regular doctor/clinic, *n (%)*	231 (50.5)	76 (39.8)	155 (58.3)	**<0.01**
Treated in ER past 90 days, *n (%)*	77 (16.8)	27 (14.1)	50 (18.8)	0.19
Social support, *mean (SD)*	53.5 (28.4)	52.5 (27.6)	54.3 (29.0)	0.49
Need Factors				
Health problems in past 90 days, *n (%)*	197 (43.1)	85 (44.5)	112 (42.1)	0.61
STI diagnosis in past year[a], *n (%)*	71 (15.6)	29 (15.2)	42 (15.9)	0.83
Paying male partners in past 90 days, *mean (SD)*	19.8 (43.9)	20.2 (52.1)	19.5 (36.9)	0.88
Sexual assault in past 90 days, *n (%)*	40 (8.8)	11 (5.8)	29 (10.9)	**0.055**
Times sex past 90 days[a], *mean (SD)*	107.9 (157.9)	89.2 (105.5)	121.4 (185.6)	**0.02**
Times unprotected vaginal sex past 90 days[a], *mean (SD)*	18.0 (45.3)	17.3 (38.9)	18.5 (49.4)	0.78
Perceived HIV risk[a], *n (%)*				
No chance/unlikely	302 (66.8)	115 (61.8)	187 (70.3)	0.06
50/50 or very likely	150 (33.2)	71 (38.2)	79 (29.7)	

[a]Item was missing data, N=456; N=455; N=456; N=451; N=452

Table 2

Predisposing, enabling and need factors of 98 HIV positive female sex workers

	Total (n=98)	No care (n=23)	HIV care (n=75)	Sign.
Predisposing Factors				
Age, *mean (SD)*	42.1 (6.4)	42.1 (6.7)	42.1 (6.4)	0.99
High school education, *n (%)*	35 (35.7)	12 (52.2)	23 (30.7)	0.06
Homeless in past 90 days, *n (%)*	32 (32.7)	13 (56.5)	19 (25.3)	**<0.01**
Substance use in past 90 days, n (%)				
Cocaine	46 (46.9)	14 (60.9)	32 (42.7)	0.13
Crack	82 (83.7)	19 (82.6)	63 (84.0)	0.88
Heroin	12 (12.2)	3 (13.0)	9 (12.0)	0.89
Paying male partners in past 90 days, mean (SD)	15.9 (24.6)	30.1 (40.9)	11.5 (14.7)	**0.04**
Sexual assault in past 90 days, *n (%)*	13 (13.3)	6 (26.1)	7 (9.3)	**0.04**
Times sex past 90 days[a], mean (SD)	75.9 (94.8)	86.7 (104.6)	72.6 (92.0)	0.53
Times unprotected vaginal sex past 90 days[a], mean (SD)	14.9 (43.5)	9.6 (16.5)	16.6 (48.9)	0.50
Enabling Factors				
Income in past month, *n (%)*				
Less than $1000	22 (22.4)	8 (34.8)	14 (18.7)	0.11
$1000 or more	76 (77.6)	15 (65.2)	61 (81.3)	
Health insurance[a], *n (%)*	62 (63.9)	4 (18.2)	58 (77.3)	**<0.01**
Regular doctor/clinic, n (%)	88 (89.8)	14 (60.9)	74 (98.7)	**<0.01**
Treated in ER past 90 days, n (%)	22 (22.4)	7 (30.4)	15 (20.0)	0.29
Social support[a], mean (SD)	63.3 (30.2)	46.6 (29.7)	68.5 (28.6)	**<0.01**
Need Factors				
Health problems in past 90 days, n (%)	54 (55.1)	16 (69.6)	38 (50.7)	0.11
STI diagnosis in past year, n (%)	33 (33.7)	7 (30.4)	26 (34.7)	0.71

[a]Item was missing data for 1 respondent.