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## Finding What Works: Predicting Health or Social Service Linkage in Drug Using, African American Female Sex Workers in Miami, FL

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### Abstract

Female sex workers (FSWs) encounter numerous challenges in accessing health and social services. In this study of drug using, African American FSWs, the authors examines specific factors associated with health or social service linkage among participants in a randomized intervention trial. Respondent linkage was significantly associated with individual factors (living alone, severe internal mental distress and traumatic victimization) and project related variables (attending five case management sessions and client engagement rating). In the multivariate model, higher client engagement and session attendance remained significant. The researchers conclude by discussing the importance of intervention attendance and engagement as key contributors to health and social service linkage among FSWs.

### Keywords

female sex workers; linkage; engagement; African American; substance abuse

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Numerous studies conducted by investigators internationally have documented that street based female sex workers (FSWs) often experience adverse health outcomes, including physical and mental health problems, high levels of abuse, violent victimization, sexually transmitted infections (STIs), HIV infection, and substance abuse (Baral et al., 2012; Cohan et al., 2006; Inciardi, Surratt, & Kurtz, 2006; Kurtz, Surratt, Kiley, & Inciardi, 2005; H. L. Surratt & Inciardi, 2010; H.L. Surratt, O'Grady, Kurtz, Buttram, & Levi-Minzi, 2014; H.L. Surratt, O'Grady, Kurtz, Levi-Minzi, & Chen, 2014; Ulibarri et al., 2014). Despite these health problems, researchers conducting intervention studies among FSWs in the United States and abroad have been successful in promoting HIV prevention and reducing drug use, sexual risk behaviors, and STIs through: utilizing community level empowerment and mobilization models, STI care promotion, initiatives to increase access to sexual and other health services, and harm reduction strategies (Blanchard et al., 2013; Bungay et al., 2013;

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Conflicts of interest  
No conflict declared.

Kerrigan, Fonner, Stromdahl, & Kennedy, 2013; Reza-Paul et al., 2008; Strathdee et al., 2013; H. L. Surratt & Inciardi, 2010; H.L. Surratt, O'Grady, Kurtz, Levi-Minzi, et al., 2014). Despite the demonstrated utility of these interventions by several authors, street based FSWs remain a vulnerable and hidden population; the vast majority have yet to be reached by intervention initiatives, and very few seek out needed health and social services. As such, it is essential for practitioners and researchers with a stake in improving the health of disenfranchised women to continue to explore and understand how to best engage high-risk FSWs in intervention efforts. This paper presents results from a recently completed U.S. based intervention study with highly vulnerable FSWs, and discusses the broad implications of these findings for those working with this population in a global context.

Researchers studying FSWs have documented numerous barriers to seeking care, including: not knowing where to obtain services, lack of transportation, inconvenient locations, long wait times, costs of care, and poor treatment by care providers (Kurtz et al., 2005; Lazarus et al., 2012; Phrasisombath, Thomsen, Sychareun, & Faxelid, 2012). Moreover, even when identified, FSWs often avoid utilizing healthcare services due to fear of care providers, the occupational stigma associated with sex work, and drug use (Buttram, Surratt, & Kurtz, 2014; Cohan et al., 2006; Kurtz et al., 2005; Lazarus et al., 2012).

The numerous individual and structural level challenges associated with sex work can affect women's willingness and ability to participate in research interventions or community-based care (Blanchard et al., 2013; Shannon et al., 2014). Findings reported by researchers conducting studies with FSWs in India, for example, have revealed that a reliable, open, supportive, accessible setting is necessary to allow FSWs to be "effective" participants in HIV prevention studies (Cornish, 2006). Although some authors have provided a limited study of the factors enabling intervention participation among FSWs, very little is known about specific intervention attributes or mechanisms that serve to engage and facilitate the process of change among this population; that is, how do they actually work?

Most prior research on client engagement as an important contributor to behavior change has stemmed from researchers conducting drug abuse treatment outcome studies (Carroll et al., 2006; Rapp et al., 2008; Wisdom, Hoffman, Rechberger, Seim, & Owens, 2009). These authors have documented that successful outcomes (i.e. lower levels of drug use) are often associated with individual factors (initiative, desire or perseverance), treatment engagement (intensity and duration of treatment), and positive therapeutic relationships (Fiorentine, Nakashima, & Anglin, 1999; Rapp et al., 2008; Dwayne D. Simpson, 2004; D.D. Simpson, Joe, Rowan-Szal, & Greener, 1997; Wisdom et al., 2009). Moreover, according to D.D. Simpson et al. (1997), the therapeutic alliance (relationship between therapist/interventionist and the client) and engagement exhibit a reciprocal relationship, with both contributing to and improving outcomes. Similarly, other authors examining engagement in behavioral interventions among community-based drug users (Dembo, Gullledge, Briones Robinson, & Winters, 2011; Gardner, McLees, Steiner, del Rio, & Burman, 2011; Mallinson, Rajabiun, & Coleman, 2007; Mitrani, Feaster, Weiss-Laxer, & McCabe, 2011; Prado et al., 2002; Rajabiun et al., 2007; Rumptz et al., 2007) identified the therapeutic alliance (Prado et al., 2002) and individual characteristics such as presence of support systems, readiness to change, and higher levels of distress (Mitrani et al., 2011; Prado et al., 2002; Rajabiun et al.,

2007; Rumpitz et al., 2007) as key predictors of intervention engagement. Results from these researchers highlight the critical role of interventionists for engaging marginalized individuals in behavioral interventions through creating the conditions which participants see as positive for the relationship, thereby increasing engagement (Prado et al., 2002).

Few investigators have examined intervention engagement specifically among FSWs (see Cornish 2006). Although prior researchers working with FSWs have stressed the importance of the social context or conditions of the intervention location as being key aspects of their effectiveness (Cornish & Campbell, 2009), the existing results reported by other authors focus heavily on the barriers experienced by FSWs, while little is known about the factors that enable participation among this vulnerable group; in other words, are there specific factors that allow sex workers to engage or be successful in the context of behavioral interventions?

Our goal for this paper is to examine specific factors influencing initial health or social service linkage among a sample of drug using, African American FSWs in Miami, FL, who were participants in a behavioral intervention trial. Specifically, we explore the associations of individual and intervention-related factors, including client engagement level (as measured by case manager ratings of client involvement, interest, understanding and willingness to work on goals) and intervention dosage (number of sessions attended), on the outcome of initial health or social service linkage.

## Methods

Data were drawn by the authors from a randomized intervention trial designed to test the relative efficacy of two case management interventions for drug using, African American FSWs on the outcomes of: health or social service linkage and HIV risk behavior reduction. Clients were randomly assigned to either a Strengths Based Case Management (SBCM)/Professional-Only condition (case manager worked with the client to set and achieve service goals); or a SBCM/Professional Peer condition, (professional case manager and a former sex worker peer collaborated with the client to develop service goals and linkages). Researchers have documented success in using peer educators in the context of various health promotion initiatives among marginalized groups yielding the following outcomes: reductions in high risk sexual behaviors among young gay men (Hays & Peterson, 1994), increased needle cleaning in injection drug user networks (Latkin, 1998), the promotion of adherence to antiretroviral therapy among those who are HIV positive (Broadhead et al., 2002), and the enhancement of the experiences of FSWs receiving HIV education in our prior work (H. L. Surratt & Inciardi, 2010). As such, for this project, we hypothesized that that the addition of a peer case manager would increase the efficacy of the SBCM intervention.

Both conditions offered five structured case management sessions over a two month period in line with the basic tenets of the SBCM model (Modrcin, Rapp, & Chamberlain, 1985; Rapp, 2006). According to Modrcin et al. (1985), this model rests on two main principles: (a) providing clients with support for asserting direct control over their search for resources (i.e housing or employment); and (b) using the clients' own strengths and assets as the means for attaining these resources. Modrcin et al. (1985) also described SBCM as a model

that encourages informal-helping networks (as opposed to institutional ones), and promotes the importance of the client-case manager relationship. SBCM is rooted in the idea that change is best supported through recognition and acceptance of the client's current beliefs, rather than a direct confrontation that may inhibit the development of the relationship between the client and case manager; further, case managers use non-directive techniques and emphasize the self-efficacy of the client, while assuming that there are likely both internal and external barriers present which could inhibit them from engaging in needed services.

During each case management session, case managers used a contact plan to summarize goals, including steps to achieve them and possible barriers. The case manager also made active referrals at each session for any services requested by the participant. Although session length varied depending on the client's needs, the number of prior sessions, and level of participation, overall sessions averaged 30 minutes in length. During session one, case managers focused on developing rapport, connection, and engagement, regardless of the participant's feelings toward service linkage. During session two, the case manager used a standardized strengths assessment to identify participant strengths that could be used to deal with linkage barriers. The case manager used session three to identify barriers and reinforce strengths; during session four she reviewed identified strengths, summarized progress, and examined remaining barriers while brainstorming solutions. The fifth session gave the case manager an opportunity to disengage with the participant, while at the same time ensuring that the participant had the necessary information to follow through with desired linkage at a later time. The SBCM/Professional Peer condition included the same five session structure and content however; in addition, the peer facilitator participated in the intervention sessions and provided ongoing support for service linkage through remaining in contact with their cases throughout the entire 6 month study participation period. See H.L. Surratt, O'Grady, Kurtz, Levi-Minzi, et al. (2014) for a more comprehensive description of the interventions.

All intervention staff (site manager, case managers, and peers) participated in formal training in SBCM conducted by a licensed clinical social worker with extensive expertise in this area. The site manager oversaw the day- to-day research operations in the field office and supervised all staff activities, while the case managers were the clinical interventionists assigned to work with participants directly on their individual goals.

### **Target Population and Study Eligibility**

Drug-using, African American FSWs residing in Miami Dade County were the target population for this trial. Eligible participants included African American women ages 18-50 who had traded sex for money or drugs at least three times in the past 30 days and used cocaine, crack or heroin three or more times a week in the past 30 days. Those currently participating in a substance abuse treatment program were excluded from the study.

### **Study Recruitment**

Recruiting for the study by outreach workers began in May, 2007, and continued through June 2010. A total of 562 eligible clients were enrolled, randomized, and retained in the study. Follow-up interviews were completed in January, 2011. Purposive, targeted sampling

strategies (Watters & Biernacki, 1989) were used by the researchers to recruit this specific, hard to reach population. Project recruitment for the study has been described in greater detail elsewhere (H.L. Surratt, O'Grady, Kurtz, Levi-Minzi, et al., 2014). Recruitment efforts were focused in known primary street sex work locations north of downtown Miami. To gain access to potential respondents in target areas, recruitment was conducted by professional outreach workers and active sex workers living within these communities. The project's intervention center was located near two of the major sex work hubs in Miami-Dade County and was easily accessible via public transportation.

### Study Procedures

Potential participants from various street locations were given contact information for the project intervention center, and were asked to complete screening over the phone to determine eligibility. Eligible participants were scheduled for appointments at the project office. Upon arrival, participants were re-screened, informed consent was obtained, and trained female study staff conducted computer-assisted personal interviews (CAPI). This interview typically lasted 1 hour and clients were paid a \$25 stipend upon completion. Following the baseline interview, participants were randomly assigned to one of the two intervention conditions as described above. Follow up assessments were also conducted by research staff at 3 and 6 months post baseline. All project staff completed the requirements for the National Institutes of Health (NIH) web-based certification for the protection of human subjects. Study protocols were approved by the University of Delaware's (predecessor institution) and Nova Southeastern University IRBs. A Certificate of Confidentiality was also obtained from the National Institutes of Health.

### Measures

The Global Appraisal of Individual Needs, GAIN v. 5.4, (Dennis, White, Titus, & Unsicker, 2008) was chosen as the primary data collection instrument for the study by the study's principal investigator; it has been the core research measure across several major multi-site studies funded by the National Institute on Drug Abuse and has been used in our prior work with marginalized, at risk samples of substance abusers. Researchers conducting psychometric studies have found Cronbach's alphas between 0.9 and 0.8 and behavior questions have demonstrated test-retest correlations over 0.8 (Dennis et al., 2008). The GAIN has eight core sections including: demographics; mental and physical health; HIV risk behaviors; and environmental, legal, and vocational measures.

**Mental health**—Mental distress was measured by the GAIN's IMDS, which includes somatic symptoms, traumatic symptoms, depressive symptoms or anxiety/fear symptoms experienced in the past 12 months. The IMDS has been reported by other authors to have a Cronbach's alpha of 0.94 (Dennis et al., 2008). The criterion for severe internal distress was met by participant endorsement of 21 or more out of 38 items. Recent mental health problems were measured by the question “when was the last time your life was significantly disturbed by mental or psychological problems?”; those endorsing past 90 day mental health problems were then asked whether they received treatment for this issue (response choice was yes or no).

**Drug use**—Past month drug use measured specific substances including alcohol, marijuana, powder cocaine, crack cocaine, and non-medical use of prescription sedatives or opioids. To assess for past year substance dependence, the TCU Drug Screen II (Institute of Behavioral Research, 2006) was used by the authors. The overall reliability for the TCU has been reported by others at 0.9. Participant endorsement of 3 or more items out of 9 (e.g. using causes emotional or psychological problems, you get sick or have withdrawal when you quit or miss); constituted DSM-IV dependence (Institute of Behavioral Research, 2006).

**Health and social characteristics**—The authors chose to assess other health and social characteristics through questions including: “When was the last time you experienced health or medical problems that kept you from meeting your responsibilities or interfered with your daily activities?” This variable was dichotomized by the authors to past 90 days or more than 90 days ago. To assess for HIV status respondents were asked, “When was your last HIV test and what was the result?” Those reporting no prior testing or inconclusive test results were not included in this analysis (n=7). Respondent endorsement of four or more of the 11 items from the adapted GAIN's General Victimization Scale (GVS) constituted a severe lifetime history of traumatic victimization (Dennis et al., 2008). In addition, the authors wished to get information about participant monthly income, whether they had any health insurance, the last time they considered themselves to be homeless (dichotomized to past 90 days/ more than 90 days or never), and who they were currently living with.

Social support was measured by the investigators using the MOS social support survey (Sherbourne & Stewart, 1991), a 19 item instrument including the domains of emotional/ informational support, tangible support, affectionate support, and positive social interaction; scores were generated from a 1-100 scale for comparison to published means, with Cronbach's alpha for overall social support at 0.97. Personal mastery was assessed by the authors using the Personal Mastery Scale (Pearlin, Menaghan, Lieberman, & Mullan, 1981) consisting of 7 items answered on a 5-point (strongly agree/disagree) scale. This scale measures the extent to which an individual believes life events or circumstances are under one's own control. Higher scores indicate higher mastery and Cronbach's alphas of 0.64 have been reported (Pearlin et al., 1981).

**Intervention variables**—Baseline data is reported here by the authors to assess initial linkages made during the time frame of the 5 intervention sessions. Since the 2 groups did not differ on attendance or engagement, the authors pooled the data for analysis. Intervention- related variables included case manager reported level of client engagement and initial service linkage. The engagement variable encompassed a case manager rating recorded after each session on a scale from 0-3 (0=very poor, 1=poor, 2=average, 3=good) on the following dimensions: client involvement/ engagement, client interest in session topics, client understanding of session's content and objectives, and client willingness to work on goals and objectives. Depending on the number of sessions attended, participants could have a maximum of five possible scores on each of the four dimensions (ranging from 0 to 12). An average engagement score was computed by the authors by summing the ratings for each attended session and dividing by the number of engagement scores for each

participant (some participants attended sessions but had missing data for the engagement variables). Two participants were missing engagement scores.

An initial service linkage was a referral that the case manager provided to the participant based on her individual needs. Depending on the service type, a number of possible scenarios could have taken place: the case manager provided the participant with referral information, the participant made the appointment and reported back verifying whether she went (if so, the case manager also independently verified); the case manager called to make the appointment for or with the participant and the participant reported back whether she went; or the case manager accompanied the participant to the appointment. Based on these specifics, an initial service linkage was recorded by the case manager when: participants reported attending appointments; and/or case managers independently verified or accompanied participants to appointments.

## Analysis

Data were analyzed by the authors using IBM SPSS Statistics, version 20. The primary author calculated descriptive statistics to describe the sample (N=562) in terms of demographics, physical and mental health status, substance use and dependence. Bivariate logistic regression models were constructed and analyzed by the researchers to predict any service linkage by: demographics, mental health, other social and mental health characteristics, recent illicit and prescription drug use, and project related variables including number of case management sessions attended (less than five or five) and a level of engagement of 2.15 or above (25<sup>th</sup> percentile and above). Engagement was dichotomized by the authors to distinguish between those with the lowest levels of engagement, as compared to others, in an effort to explore the minimum threshold that would allow for successful linkage. Significance level was set at  $p < .05$  for all comparisons.

Logistic regression was used by the researchers to determine which factors were significantly associated with the primary outcome variable of interest: initial health or social service linkage during the 5 session intervention. This analysis is based on baseline data and only examines a linkage during the time frame of the 5 intervention sessions; it does not utilize follow-up data to examine later linkages (over the course of the entire six month study period). In the logistic regression analysis, this variable was dichotomized by the investigators as initial linkage versus no linkage. Independent variables included in the regression model were selected by the authors based on prior researchers' findings related to barriers to seeking care for sex workers and predictors of engagement in interventions among African American women (Kurtz et al., 2005; Lazarus et al., 2012; Prado et al., 2002). Predictors that were significant in the bivariate logistic regression analyses ( $p < 0.05$ ) were added by the authors simultaneously to a multiple logistic regression model. The researchers found no evidence of multicollinearity among the predictor variables (Variance Inflation Factor,  $VIF < 2$  for all variables).

## Results

### Descriptives

The sample characteristics were tabulated by the authors and are displayed in Table 1. The mean age of the sample was 39.29 (SD 8.49). More than half of the respondents reported being recently homeless (54.80%) and one third of participants had health insurance (33.16%). When examining mental health variables, over half of the respondents (54.50%) reported severe internal distress and recent disturbance by psychological problems (59.40%); of those disturbed by psychological problems, only 28.36% reported receiving any treatment. The majority of the participants reported severe lifetime traumatic victimization (83.27%). In terms of substance abuse and dependence, 90.60% met criteria for past year substance dependence; in the past month, over three-quarters used alcohol (83.80%), over half used marijuana (56.40%), crack (68.70%), and cocaine (52.00%), while prescription drug misuse was less common (17.30% reported sedative abuse and 13.20% abused opioids). Initial linkage was achieved by over half of the sample (53.38%); linkage to a drug treatment program was reported most often (17.1%), followed by linkage to medical care (10.70%), and linkage to a service to obtain an ID or other documents (9.80%). A large majority of the respondents (83.04%) attended all 5 case management sessions, and client engagement scores for the 25<sup>th</sup> percentile and above were achieved by 77.60% of the participants.

### Bivariate Analysis

Table 2 shows the researchers' results of the bivariate logistic regression model predicting initial health or social service linkage. Participant linkage was significantly associated with living alone (OR 1.532; [95% CI 1.056, 2.223];  $P=0.025$ ), severe internal mental distress (OR 1.484; [95% CI 1.062, 2.072];  $P=0.021$ ), and severe traumatic victimization (OR 1.602; [95% CI 1.025, 2.504]  $P=0.039$ ). Higher social support and personal mastery were each associated with *lower* odds of initial linkage, as were past month alcohol, marijuana and prescription sedative use. Both intervention-related variables were significantly associated with higher odds of initial linkage: attending all five case management sessions (OR 2.347; [95% CI 1.492, 3.693]  $P<0.000$ ), and higher engagement (OR 2.038; [95% CI 1.357, 3.062]  $P=0.001$ ).

### Multivariate Analysis

Table 2 also displays the multivariate logistic results calculated by the authors. Factors found by the researchers to be significantly associated with lower odds of making an initial linkage were past month alcohol use (OR 0.517; [95% CI 0.312, 0.857];  $P=0.011$ ), marijuana use (OR 0.579; [95% CI 0.404, 0.828];  $P=0.003$ ), and prescription sedative misuse (OR 0.555; [95% CI 0.345, 0.894];  $P=0.016$ ). The authors report that living alone was associated with significantly higher odds of making an initial linkage (OR 1.534, [95% CI 1.029, 2.286,  $P=0.035$ ], and the odds of making an initial linkage were 2.252 times greater for those who attended five case management sessions compared to those who attended fewer than 5 sessions ([95% CI 1.388, 3.623],  $P=0.001$ ); clients with higher engagement had 1.665 greater odds of making an initial linkage versus those with lower engagement scores ([95% CI 1.078, 2.573],  $P=0.022$ ).

## Discussion

Our study is among the first to examine specific factors associated with immediate health or social service linkage among drug using, African American FSWs in a randomized intervention trial. At the individual level, we discovered that living alone, victimization, and severe internal mental distress were associated with initial service linkage in the bivariate models. It is possible that individuals living in these difficult circumstances had more of a sense of urgency to actively seek help. Our results are consistent with prior studies documenting that those with higher internal distress are more likely to be engaged in interventions (Prado et al., 2002). In terms of intervention level variables, we revealed that attendance at 5 case management sessions and higher levels of engagement were significantly associated with initial linkage; in the multivariate model, session attendance and client engagement remained significant for increasing the odds of initial service linkage.

Research by other investigators has indicated that longer treatment time is associated with increased benefits and more positive outcomes among individuals in drug abuse treatment (Rapp, 2006; Dwayne D. Simpson, 2004; D.D. Simpson et al., 1997). Similarly, our findings reflect that higher intervention dosage (attending all five sessions) was associated with an increased likelihood of making an initial linkage. Higher client engagement scores also predicted linkage in both the bivariate and multivariate models. Interestingly, we found that engagement was consistent and stable over the course of the five session intervention period; participants tended to be rated as consistently high or low, and those who entered the study with high engagement were more likely to make a successful linkage. This finding resonates with literature written by authors specializing in drug abuse treatment; patient attributes, including motivation for change and treatment readiness, are important predictors of retention and engagement in treatment (Joe, Simpson, & Broome, 1998).

Other researchers have highlighted attributes that are likely to increase client attendance including the use of special project offices and clinics solely for FSWs; settings such as these promote respectful and safe care and attention, which is crucial for this vulnerable population (Murray, Lippman, Donini, & Kerrigan, 2010). Although our study did not have an on-site clinic to provide medical or mental health services, the office was used exclusively for this project; in other words, only female staff and participants were permitted, which perhaps contributed to increased session attendance. In order to further contextualize these results, client comments from anonymous surveys at study exit were examined to help to shed light on our findings. When asked what they “liked” about the study the most common reply included the caring, open, and non-judgmental nature of the study staff. One participant commented, “this whole organization means a lot because when you come here people don't, you guys don't treat us like we're crack heads. You treat us like we are human beings...you treat us like we are somebody, which we are, but everybody don't cause we got labels...” This quote also illustrates how the professional case managers in the present study seemed to be different than those they had encountered at clinics or social service agencies. This finding supports those from other authors who have reported the continued difficulty encountered by sex workers in finding social service staff and health providers who are understanding of their problems and have a genuine interest in helping (Kurtz et al., 2005). The client feedback also suggests that perhaps the environment created

by the use of the strengths based approach, in conjunction with the non-judgmental, caring attitudes of staff also increased attendance, which in turn, facilitated the process of linking to services. When asked about what made the program supportive in efforts to make changes, one commented about her case manager: "...not being judged on whatever I said. (Case manager) never judged me on anything I said. She just listened to me. She never looked down on me and she was there..." These comments resonate with other findings from investigators conducting international research with FSWs, which highlight the importance of simple access to this type of support as a means to open up new possibilities for change (Cornish, 2006). Our findings also suggest that the SBCM model that was successful in engaging FSWs in this study could be useful in other resource-limited environments where highly specialized staff may be unavailable.

### Limitations

Since we utilized targeted sampling to recruit FSWs in specific areas, the findings reported here may not be representative of other FSW in South Florida or elsewhere. Furthermore, our results cannot be generalized to FSWs operating in other contexts (i.e. brothels). Another limitation is that our results utilized only baseline data to examine the initial linkages made within the immediate five session intervention period; we do not report on follow-up or outcome data which would show linkages made throughout the six month study period. The study also utilized self-report data, which is subject to reporting and social desirability bias and recall problems.

### Conclusions

Despite these limitations, our study highlights client attendance and engagement in contributing to increased initial health and social service linkage for FSWs. Consistent with prior findings from other authors documenting the use of specialty centers designed solely for this population (Murray et al., 2010), it is possible that the safe, respectful environment was a factor which increased client attendance and engagement, which in turn, increased the likelihood of linkage. Another possible factor not studied here is the role of the therapeutic alliance or relationship with the interventionist. Our results seem to complement those reported by other researchers documenting the importance of the therapeutic alliance above and beyond individual participant characteristics (Fiorentine et al., 1999; Prado et al., 2002; D.D. Simpson et al., 1997), and its possible role in increased session attendance (D.D. Simpson et al., 1997).

Our data also complement findings from previous researchers related to FSWs in documenting the need for new and innovative strategies to encourage service linkage, including social service and health care staff training in providing more sensitive, non-judgmental health care services (Kurtz et al., 2005; Lazarus et al., 2012). The findings from our intervention trial with FSWs suggest that strengths based case management is a promising intervention approach for engaging substance abusing, marginalized FSWs, a population typically disconnected from formal health care systems (H.L. Surratt, O'Grady, Kurtz, Levi-Minzi, et al., 2014). Our results also suggest the need for further research on the

role of the therapeutic alliance in the engagement and retention of highly marginalized and hidden populations in interventions.

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**Table 1**

Description of study sample (N=562)

<b>Demographic Variables:</b>	<b>N</b>	<b>%</b>
Age, mean (SD)	39.29 (8.49)	
Recent Homelessness (past 90 days)	308	54.80
Monthly Income <sup>1</sup> :		
Over \$2000	202	36.01
Between \$1,000-\$2,000	167	29.77
Under \$1,000	192	34.22
Health Insurance <sup>1</sup>	186	33.16
Education:		
More than high school	85	15.10
High school	185	32.90
Less than high school	292	52.00
Live Alone	161	28.60
Living with Child under 18	119	21.20
Mental Health Variables:		
Past year substance dependence	509	90.60
Severe internal mental distress	306	54.50
Recent mental health problems <sup>1</sup> (past 90 days)	334	59.40
Current Mental Health Treatment <sup>2</sup>	95	28.36
Other Health and Social Characteristics:		
HIV positive <sup>3</sup>	98	17.66
Past 90 health problems	256	45.55
Severe traumatic victimization	468	83.27
Social support, mean (SD) <i>Range 15-95</i>	60.80 (22.05)	
Overall personal mastery, mean (SD) <i>Range 11 -35</i>	23.33 (4.478)	
Past Month Drug Use:		
Alcohol	471	83.80
Marijuana	317	56.40
Crack	386	68.70
Cocaine	292	52.00
Rx sedatives	97	17.30
Rx opioids	74	13.20
Project-Related Variables:		
Initial Service linkage	300	53.38
Attended 5 case management sessions <sup>4</sup>	465	83.04

Demographic Variables:	N	%
Client engagement (25 <sup>th</sup> percentile and above) <sup>4</sup> <i>Mean (SD)</i>	436 2.41 (0.379)	77.60

<sup>1</sup>Data missing for 1 participant

<sup>2</sup>N= 334

<sup>3</sup>Those that reported an inconclusive HIV test or had not had a previous test were not included in this analysis (n=7)

<sup>4</sup>Data missing for 2 participants

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**Table 2**  
 Bivariate and multivariate logistic regression models predicting factors affecting initial health or social service linkage (N=562)

	Bivariate			Multivariate		
	P	Odds ratio	95% CI	P	Odds ratio	95% CI
Age, mean (SD)	0.154	0.986	0.967, 1.005	-	-	-
Recent Homelessness <sup>4</sup> (past 90)	0.104	1.319	0.945, 1.841	-	-	-
Monthly Income <sup>1</sup>						
Over \$2,000 <sup>5</sup>						
Between \$1,000 and \$1,999	0.592	1.119	0.742, 1.686	-	-	-
Under \$1000	0.212	1.288	0.866, 1.915	-	-	-
Health Insurance <sup>1,4</sup>	0.737	1.062	0.747, 1.511	-	-	-
Education:						
More than high school <sup>5</sup>						
High school	0.785	0.931	0.556, 1.559	-	-	-
Less than high school	0.678	0.902	0.555, 1.466	-	-	-
<b>Live Alone<sup>4</sup></b>	<b>0.025</b>	<b>1.532</b>	<b>1.056, 2.223</b>	<b>0.035</b>	<b>1.534</b>	<b>1.029, 2.286</b>
Living with Child under 18 <sup>4</sup>	0.653	1.103	0.719, 1.694	-	-	-
Mental Health Variables:						
Past year substance dependence <sup>4</sup>	0.709	1.114	0.632, 1.962	-	-	-
<b>Severe internal mental distress<sup>4</sup></b>	<b>0.021</b>	<b>1.484</b>	<b>1.062, 2.072</b>	<b>0.108</b>	<b>1.393</b>	<b>0.930, 2.087</b>
Recent mental health problems <sup>4</sup> (past 90 days)	0.946	1.012	0.722, 1.418	-	-	-
Current Mental health treatment <sup>2,4</sup>	0.130	1.451	0.896, 2.350	-	-	-
Other Health and Social Characteristics:						
HIV positive <sup>2,4</sup>	0.342	0.809	0.523, 1.252	-	-	-
Past 90 health problems <sup>4</sup>	0.213	1.236	0.886, 1.726	-	-	-
<b>Severe traumatic victimization<sup>4</sup></b>	<b>0.039</b>	<b>1.602</b>	<b>1.025, 2.504</b>	<b>0.248</b>	<b>1.345</b>	<b>0.841, 2.224</b>
<b>Social support, mean</b>	<b>0.018</b>	<b>0.991</b>	<b>0.983, 0.998</b>	<b>0.323</b>	<b>0.996</b>	<b>0.987, 1.004</b>

	Bivariate			Multivariate		
	p	Odds ratio	95% CI	p	Odds ratio	95% CI
<b>Overall personal mastery, mean</b>	<b>0.048</b>	<b>0.963</b>	<b>0.928, 1.000</b>	0.783	0.994	0.951, 1.039
Past Month Drug Use:						
<b>Alcohol<sup>4</sup></b>	<b>0.009</b>	<b>0.537</b>	<b>0.336, 0.859</b>	<b>0.011</b>	<b>0.517</b>	<b>0.312, 0.857</b>
<b>Marijuana<sup>4</sup></b>	<b>0.001</b>	<b>0.552</b>	<b>0.393, 0.775</b>	<b>0.003</b>	<b>0.579</b>	<b>0.404, 0.828</b>
Crack <sup>4</sup>	0.862	1.032	0.722, 1.475	-	-	-
Cocaine <sup>4</sup>	0.066	0.732	0.525, 1.021	-	-	-
<b>Rx sedatives<sup>4</sup></b>	<b>0.009</b>	<b>0.553</b>	<b>0.355, 0.862</b>	<b>0.016</b>	<b>0.555</b>	<b>0.345, 0.894</b>
Rx opioids <sup>4</sup>	0.707	0.911	0.558, 1.485	-	-	-
Project-Related Variables:						
<b>Attended 5 case management sessions<sup>3,4</sup></b>	<b>&lt;0.001</b>	<b>2.347</b>	<b>1.492, 3.693</b>	<b>0.001</b>	<b>2.252</b>	<b>1.388, 3.653</b>
<b>Client engagement (25<sup>th</sup> percentile and above)<sup>3,4</sup></b>	<b>0.001</b>	<b>2.038</b>	<b>1.357, 3.062</b>	<b>0.022</b>	<b>1.665</b>	<b>1.078, 2.573</b>

<sup>1</sup>Data missing for 1 participant

<sup>2</sup>Those that reported an inconclusive HIV test or had not had a previous test were not included in this analysis (n=7)

<sup>3</sup>Data missing for 2 participants

<sup>4</sup>Reference group is 'no'

<sup>5</sup>Reference group