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The evaluation of the JEWEL project: An innovative economic enhancement and HIV prevention intervention study targeting drug using women involved in prostitution

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Abstract
The JEWEL (Jewellery Education for Women Empowering Their Lives) pilot study examined the efficacy of an economic empowerment and HIV prevention intervention targeting illicit drug-using women ($n=50$) who were involved in prostitution in Baltimore, Maryland. The intervention was comprised of six 2-hour sessions that taught HIV prevention risk reduction and the making, marketing and selling of jewellery. Bivariate comparisons examined behaviour change pre- and 3-months post-intervention. The intervention's effect on the change in the number of sex trade partners from baseline to follow-up was explored with multiple linear regression. Participants were 62.0% African American, 5.0% were currently employed, and the median age was 39 years old (Inter Quartile Range [IQR]: 34–45). Women attended an average of six (IQR: 4.5–6.0) sessions. The women sold over $7,000 worth of jewellery in eleven sales. In comparing self-reported risk behaviours pre and 3-month post intervention participation, we found significant reductions in: receiving drugs or money for sex (100% versus 71.0%, $p<0.0005$); the median number of sex trade partners per month (9 versus 3, $p=0.02$); daily drug use (76.0% vs. 55.0%, $p=0.003$); the amount of money spent on drugs daily (US$52.57 versus US$46.71, $p=0.01$); and daily crack use (27.3% versus 13.1.0%, $p=0.014$). In the presence of other variables in a multivariate linear model, income from the jewelry sale was associated with a reduction in the number of sex trade partners at follow-up. The pilot indicated effectiveness of a novel, HIV prevention, economic enhancement intervention upon HIV sexual risk behaviours and drug utilization patterns.

Introduction

The preponderance of epidemiological research on female drug users' risk of HIV focuses on individual-level sociodemographic factors. A number of studies have documented elevated sexual risk behaviours among drug using women compared to their male counterparts, resulting in significantly higher rates of HIV and sexually transmitted infections (STIs) (Doherty et al., 2000; Kral et al., 2000; Latka et al., 2001; Sherman et al., 2003). Much of the research examining the role of sexual risk as related to HIV and STIs among women drug users has been among crack smokers. Crack use has been associated with increased sexual activity due to heightened sexual arousal (Ross et al., 2002; Ross et al., 1999), trading sex for money or drugs (Baseman et al., 1999; Chiasson et al., 1991; Ross et al., 2002), and having multiple sex partners (Ross et al., 2002). While these are significant factors in HIV risk, such an individual focus de-emphasizes the role of broader relationship and structural factors that shape women's risk through multiple direct and indirect pathways. The current study examines the effects of a novel economic empowerment HIV prevention intervention upon sexual and drug-related risk behaviours.

O'Leary (2001) described women's structural vulnerabilities as a 'nexus of risk', whereby interactions between diverse social disadvantages facilitate HIV risk-taking behaviours. Research points to economic disadvantage as a crucial contextual HIV risk factor among women (Klein et al., 2002; O'Leary, 2001). Regardless of route of administration (i.e. injecting, snorting, or smoking), similar social, cultural and economic, contextual factors shape sexual and drug use behaviours among female drug users (Rhodes & Quirk, 1998; Sanders-Phillips, 2002). Poverty is the central factor that characterizes HIV/AIDS vulnerability throughout the world (Farmer, 1996; Fenton, 2004; Friedman, 1998; Klein et al., 2002) which, on an individual level, manifests as lack of access to and control over actions, resources, and self-determination (Ulin, 1992).

Female drug users often live in the context of severe economic disadvantage, fluctuating between

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intermittent employment and unemployment (Zanis et al., 1994). Their 'work' is often limited to illicit low status 'employment' in the drug economy and trading sex for money, drugs, or shelter (Connors, 1996; Ross et al., 2002). Women drug users may become involved in the street-level sex industry because of a complex array of socioeconomic factors including low levels of education and limited gainful employment skills coupled with financial need that includes supporting a drug habit (Weeks et al., 1998). Economically motivated sexual behaviours, such as exchanging sex for money or drugs, compromises women's ability to employ safer sex strategies and challenges their ability to be concerned about the long-term consequences of their sexual behaviours. In turn, their risk of becoming infected with HIV and other STIs is increased (Nelson et al., 1995; Worth, 1990).

Although many researchers have identified a need for structural and environmental interventions to reduce HIV risks among drug users (Friedman, 2000; Miller & Neaigus, 2001; O'Leary, 2001; Rhodes & Quirk, 1998; Sweat & Denison, 1995), very few studies have attempted to do so. The preponderance of HIV intervention research remains focused on individual-level behaviour change by employing rational decision-making theories such as the health belief model (Fishbein & Ajzen, 1975), the theory of reasoned action (Montana et al., 1997), and social learning theory (Bandura, 1977). While such theories are necessary in the development of behavioural interventions, interventions based solely on these theories have shown short-term behaviour change efficacy in various high-risk populations (DeHovitz et al., 1994; Kelly et al., 1989; Susser et al., 1998) but have been less successful in creating sustainable (more than six months) behaviour change among drug users (Des Jarlais et al., 1991; Oakley et al., 1995) and are insufficient when offered alone (Latkin & Knowlton, 2000). Further, application of these theories among drug users has been critiqued for their assumption of behaviour as volitional, their reliance upon rational thinking, and insufficient accounting for other factors that are socially, culturally, and economically mediated (Rhodes et al., 1996).

It is well established that poverty is associated with HIV risk behaviours and long-term drug use, but there are few examples of HIV prevention interventions among drug users that focus on expanding their economic opportunities. Job skills training could provide multiple benefits in the lives of drug using women who are involved in the sex trade. Though environmental interventions for HIV prevention as defined by Sweat and Denison (1995) have been slow to develop in the US, lessons can be learned from other fields. The notion of economic empowerment and job skills training for low-income populations is well established in the economic development literature, with numerous evaluations of the impact of micro-enterprise industries on women's economic well being (Hashemi et al., 1996; Schuler et al., 1997; Sebstad & Chen, 1996). Substantial research has been conducted in the developing world on the impact of micro-enterprise on women's economic well being (Hashemi et al., 1996; Schuler et al., 1997; Sebstad & Chen, 1996). Throughout Asia and Africa, models such as the Grameen Bank have been shown to increase women's economic well being, enhance contraceptive use, and strengthen their position in families (Hashemi et al., 1996; Schuler et al., 1997).

A small number of US studies focus on job training for former drug users, with the explicit goal of promoting long-term abstinence through program participation contingent upon sobriety. Evaluations of vocational interventions in differing treatment modalities have demonstrated short-term success but mixed results in long-term effects in relapse prevention and increasing employment with mixed results in long-term (Higgins & Silverman, 1999; Milby et al., 2003; Silverman et al., 2002). A novel approach in this field is that of the therapeutic work place, in which rewards for job training and employment are contingent upon abstinence (Bigelow & Silverman, 1999; Milby et al., 2003; Silverman et al., 2002; Widman et al., 2000). These studies have shown mixed results in long-term abstinence. Such highly behaviourally controlled environments only reach the small percentage of treatment seeking, drug users who are able to comply with such a highly regulated environment (Schottenfeld et al., 1992; Zanis et al., 1994). Vocational training programmes have not been tested among active drug users and as a result, there is a dearth of information on how such programmes affect illicit drug utilization patterns and HIV/STI risk behaviours.

The current study describes results from a pilot economic enhancement HIV prevention intervention study upon sexual and drug-related risk behaviours among women drug users involved in the sex trade. Economic enhancement was the broader framework of the study in that it was designed to address environmental barriers to prevention such as lack of access to sustainable and licit income (Beeker et al., 1998; Zimmerman, 2000; Zimmerman, 1995; Brown, 1991). The pilot study had three primary aims: 1) to assess the feasibility of training drug using women how to make, market, and sell beaded jewellery; 2) to enhance women's HIV transmission knowledge, provide risk, and critical thinking skills; and 3) to enhance women's job self efficacy by

providing them training in the making, marketing and selling of beaded jewellery.

Methods

Participants

The pre- and 3-month post-intervention study was conducted in Baltimore, Maryland. Between December, 2002 and June, 2003, 54 women were recruited into the Jewellery and Education for Women Empowering their Lives (JEWEL) study. The study inclusion criteria were: being female; being 18 to 45 years of age, having traded sex for money or drugs in the past month; and having used heroin and/or cocaine at least weekly in the past month. If women were eligible for the study and agreed to consent, they were administered a behavioural survey and locator information was collected to inform them of the start date of the intervention. In total, 54 women participated in six cohorts of the six-session intervention. Follow-up interviews were conducted at three months after completion of the intervention. Four women were ineligible for follow-up: two were incarcerated; one was hospitalized; and one was in a long-term drug treatment facility. Fifty women received the follow-up survey, resulting in a follow-up rate of 90%.

Of the 98 women screened, 77 (79%) women were eligible and of those, 55 (70.0%) women attended the study's first intervention session. Of those, 50 (91%) returned for their 3-month follow-up survey. The first-session attendance rate is acceptable in light of those reported by large randomized behavioural interventions (Latkin et al., 2002; NIMH, 1998).

Recruitment

Potential study participants were recruited through targeted outreach in a neighbourhood with high rates of drug use and street prostitution. Additionally, the study was publicized at a nonprofit organization in the target neighbourhood that provides services to women involved in prostitution and at the Baltimore Syringe Exchange Program van which was parked in the neighbourhood twice a week. Women were approached by trained study recruiters who had extensive experience working with the target population in previous studies. After women heard a brief description of the study regarding a six session intervention training women in HIV prevention and jewellery making, they were asked to call or drop by the study house for screening. The study was housed in a store-front office located on a busy street in the target neighbourhood.

Intervention

The JEWEL intervention focused on HIV prevention education as well as teaching the making, marketing and selling of beaded jewellery. Jewellery making was selected as the study's economic empowerment activity because of its broad market appeal, its relatively inexpensive start-up costs, ease of learning, and the short amount of time needed to produce marketable products. The intervention was comprised of six 2-hour sessions that were divided between HIV prevention and jewellery making. A draft manual was piloted with 10 women from the study population, which informed the finalized version used throughout the study. The final manual is available from the first author upon request.

The HIV prevention component was based on the social cognitive theory (SCT), which is one of the most widely used behavioural theory utilized in HIV prevention research targeting drug users (Van Empelen et al., 2003). SCT postulates that an individual's agency in behaviour change is, in part, shaped and constrained by the socio-structural environment, such as economic conditions and life structure (Bandura, 2001; Bandura, 1989; Bandura, 1986). The intervention was highly structured and was led by a trained female facilitator who followed the scripted intervention manual. Many of the HIV prevention activities were built on those that we have utilized in our previous intervention research (Latkin, et al., 2002). HIV prevention was delivered through a variety of fun and interactive activities that did not require high levels of literacy, such as games, facilitated discussions, role-plays, and interactive demonstrations. The range of activities was designed to address different learning styles and to be mutually reinforcing.

The HIV prevention components were based on five elements in accordance with the social cognitive theory: 1) to increase women's HIV/STI disease and risk reduction knowledge as well as the effects of drugs in their lives; 2) to enhance women's self-efficacy in practicing safer sex with specific partner types and increase their outcome expectations; 3) to teach participants concrete skills-building to improve their efficacy in reducing sexual risk, risky syringe-sharing behaviours, and drug use; 4) to teach women sexual negotiation and communication skills; and 5) to provide women with the opportunity to practice newly acquired skills through role play and activities. The jewellery-making component not only taught delineated skills but also aimed to increase their self-efficacy in entering job training programmes or seeking employment. The connection between the jewellery making and risk reduction components will be made through informal, facilitator-led conversations in the jewellery-making half

of the sessions. The HIV prevention content in specific sessions was as follows: Session 1 – drug related risk reduction; Session 2 – sexual risk reduction in the context of primary, casual and trade sexual partners and related role pays; Session 3 – male and female condom demonstration, practice, and related role plays; and Session 4 – the connection between drug use and sex.

The jewellery making lessons were conducted by a local artist with extensive experience in making beaded jewellery. The jewellery making modules became increasingly complex over the course of the intervention. In Session 1, participants learned about colours, textures, and materials in preparation for making their first piece of jewellery, a bracelet. In the following four sessions, they learned the necessary techniques for making earrings and necklaces, which varied in difficulty depending on the individual's ability and interest. In preparation for the Session 5 jewellery sale, Session 4 focused on marketing skills and included role plays with facilitators to practice how to market jewellery to potential buyers. Additionally, women produced 'risk reduction' cards to accompany their individual pieces of jewellery at the upcoming sale. The cards contained messages about what the programme meant to each woman. Session 5 was a jewellery sale which occurred at the Johns Hopkins Outpatient Center. The proceeds from the sales were divided as follows in order to best reflect a 'real world' market: 50% to the individual jeweller; 30% divided between participants who worked at the sale; and 20% for supplies.

The sixth session consisted of a review of all HIV and risk reduction topics from the first four sessions, focused discussion on local job-training and GED programmes, and a graduation ceremony. Graduates and current intervention participants also had the opportunity to attend open jewellery making sessions on a drop-in basis every Wednesday during the course of the study. Jewellery from these sessions was also sold during project sales with the same guidelines for distribution of proceeds.

Procedures

The study was a pre- and three-month post-intervention study design. Through the consent process, an interviewer explained the study's purpose and issues related to confidentiality. Upon providing written informed consent, women were administered a baseline survey by a trained interviewer. Once twelve women were administered the survey, a new cohort began. Six cohorts ran consecutively from January 2003 through June 2003. The cohorts met twice weekly over a three-week period. Food was provided during each session. Women completed a follow-up interview three months after the last session of their respective cohort. This survey contained behavioural questions that were parallel to those in the baseline survey in order to measure change over time. Women were reimbursed $20 for each interview and each intervention session as well as a portion of the jewel sale proceeds (discussed below). The study was approved by the Johns Hopkins Bloomberg School of Public Health Committee on Human Research.

Questionnaire

The baseline and three-month follow-up surveys ascertained: sociodemographic characteristics; sources of income; current and past drug use patterns; an extensive employment and job training history; a job self efficacy scale; sexual behaviours with primary, casual, and sex trade partners; and a history of sexually transmitted infections. In both surveys, all behavioural questions were asked in reference to the last three months prior to interview.

Study variables

Independent variables included the following demographic characteristics ascertained at baseline: median age; race; high school graduate status; recent (past three months) homelessness; recent employment; ever participated in a job training programme; ever and recently been incarcerated, having and living with children; ever tested for HIV; and self-reported HIV status. Intervention-related variables that were examined included the median number of sessions attended, and above and below the median value of US$112.80 of money earned by those ($n =$ 42) who earned any income from jewellery sales.

All licit and illicit sources of income reported at baseline and 3-month follow-up were examined. A 12-item job self-efficacy index was developed to measure basic functions needed to maintain a job. The scale's internal consistency reliability was measured using Cronbach's alpha. Regarding the structure of the set, all items correlated positively. All seven items had correlations above the recommended value of 0.20 (Carmines & Zeller, 1978). The items were measured on a four-point Likert scale (1 = not certain at all; 2 = not very certain; 3 = certain; 4 = very certain). The corresponding alpha for the baseline index was 0.82 and the follow-up index's alpha was 0.78. The seven-item scale was comprised of the following items: 1) How certain are you that you could continue to work for an entire morning even if you need a hit (of drugs)?; 2) How certain are you that you can be on time to a job even if you are tired?; 3) How certain are you that you can be on time to a job even if you are

withdrawing and feeling sick?; 4) How certain are you that you could show up to work after missing a day without calling?; 5) How certain are you that you could do what someone tells you to do at a job?; 6) How certain are you that you can ask for clarification if someone tells you to do something that you don't understand?; and 7) How certain are you that you can concentrate for several hours on work if it was boring? Additionally, principal components analysis demonstrated that the seven items were a part of a one-factor solution by examination of the resulting screen plot and Kaiser Guttman standards (Kaiser, 1960).

Drug utilization patterns at baseline and three-month follow-up were explored, including: the use and frequency of heroin, crack, and/or cocaine use that was categorized above and below the median value of daily drug use; the amount of money spent on drugs on a typical day. Sexual behaviours explored at baseline and three-month follow-up were examined, including: number of sex partners; types of sexual partners (main, casual and trade); frequency of protected and unprotected anal, vaginal and oral sex with each sexual partner type. Continuous variables such as amount of money spent of drugs daily were divided around the median value. Response categories to the categorical drug use and sexual behavioural variables were reduced according to distribution of the data (i.e. daily vs less than daily drug use) theoretically meaningful categories (i.e. always used condom with specific sexual partner type).

Analyses

The first series of analyses compared drug utilization patterns, sexual risk behaviours, and sources of income at baseline and three-months following the intervention. Chi-square tests were used to compare dichotomous and categorical data and paired t-tests for matched observations were used to analyse continuous variables.

Unadjusted and adjusted multiple linear regression was employed to examine correlates of the change in the number of sex trader partners from baseline to follow-up. Independent variables found to be significant below the 0.20 level in univariate analyses or those that were hypothesized to be potentially associated with the outcome was entered into the exploratory multivariate regression models. We examined the nature of the relationship between continuous independent variables and the outcome. Independent variables included in the model had a linear relationship with the outcome. In building the multiple model, variables were selected manually with a back and forth step process and the final model included variables that were scientifically and statistically (<0.10) significant. The current analyses were restricted to the 50 women who completed the three-month follow-up survey. Due to the small sample size, we conducted simulation analyses with 75 and 100 people to evaluate the power of our study based on variance/covariance matrix from the raw data (Wuensch, 2002).

Results

Sample characteristics

Sociodemographic and intervention-related characteristics are displayed in Table I. Participants were 62.0% African American, 33% had completed high school or received the high school equivalency degree (GED), and the median age was 39 years old (Inter Quartile Range [IQR]: 34, 45). Twenty-seven percent reported being homeless, 5.0% reported having licit employment in the three months prior to being interviewed, and 20.0% of the sample reported having ever participated in a job training programme. Regarding incarceration, 81.0% of the sample had ever been in jail and 42% had been jailed in the three months prior to being surveyed. Seventy-six percent of the sample reported having children, with only 11.0% living with at least one of the children. All but one participant had been tested for HIV, and 9.3% reported having a positive result at baseline. No incident HIV cases were reported at 3-month follow-up.

Intervention participation

Participants attended a median of six intervention sessions (IQR: 4.5, 6.0). In total, twenty women

Table I. Sociodemographic characteristics of JEWEL participants at baseline, $n=50$.

	Percent[+]
African American	62.0
High school graduate or GED	33.0%
Median age (IQR)	39 (34, 45)
Homeless*	27.0
Currently employed*	5.0
Ever participated in a job training programme	20.0
Jailed	
ever	81.0
last three months	42.0
Have Children live with children	11.0 76.0
Tested for HIV HIV+	98.0 9.3
Intervention-related	
Median number of intervention sessions attended (IQR)	6 (4.5,6.0)
Median (IQR) amount earned from jewellery sales (USD$)	$112.80 (29, 1,231)

Notes:
[+] Unless noted.
* Past three months.

attended at least one open jewellery making session and there was an average of five participants per session (not shown). Net jewellery sales totalled US$7,000 (not shown) from 11 sales: six cohort sales (Session 5) and five additional community sales. Of the 42 (77%) women that sold at least one piece of jewellery, the median value of jewellery sold was US$112.80 per woman, ranging from US$29.00–US$1,231.

Sources of income comparisons

Table II displays comparisons of participants' sources of income at baseline and three months following the intervention. At both time periods, the women's three primary sources of income were state and federal benefits, parents, friends, and relatives, and trading sex. Between baseline and follow-up, significant reductions in illicit sources of income were reported, including: trading sex for drugs and/or money (100% vs. 71.0%, respectively, $p < 0.0005$); and selling drugs (35.0% vs. 10.5%, $p = 0.021$). Women reported a significantly higher score on the 4-point job self-efficacy index (2.6 vs. 2.9, $p = 0.004$), indicating an increase in their belief in their ability to function and maintain a job.

Drug utilization and sexual risk behaviour comparisons

Pre- and three-month post intervention comparisons of recent drug utilization and sexual risk patterns are displayed in Table III. There were significant reductions in a number of reported drug use behaviours prior to, and three months after the intervention: daily drug use (76.0% versus 55.0%, respectively, $p = 0.0003$); daily crack use (27.3% vs. 13.13%, respectively, $p = 0.0140$); injection drug use (55.6% vs. 35.6%, respectively, $p = 0.0027$); the median amount of money spent on drugs on a typical day ($52.57 USD vs. $46.71 USD, respectively, $p = 0.001$). JEWEL participants also reported significant

Table II. Recent (past three months) sources of income and job self efficacy score*, baseline and 3-month follow-up, JEWEL participants, $n = 50$.

Sources+	Baseline %	3-month follow-up %	P-value**
State/federal benefits	43.2	51.1	0.248
Parent/Friend/Relative	54.6	46.7	0.248
Traded sex for drugs/money	100.0	71.0	<0.0005
Part of full time licit job	23.8	26.2	0.500
Theft	13.6	6.7	0.453
Selling needles	25.0	12.2	0.059
Selling drugs	35.0	10.5	0.021
Touting/publicizing drugs	30.9	13.6	0.052
Street Security	12.5	2.4	0.179
Mean (SD) job self-efficacy score	2.6 (0.07)	2.9 (0.07)	0.004

Notes:
+Categories not mutually exclusive.
*Last three months.
***P*-values obtained using Students t-test for matched observations for continuous data and McNemar's Test for categorical data.

Table III. Recent (past three months) drug utilization and sexual risk patterns, pre and 3-month post intervention ($n = 50$).

Characteristic	Baseline Percent+	3-month follow-up Percent+	P-value*
Drug Utilization Patterns			
Daily drug use	76.0	55.0%	0.003
Daily crack use	27.3	13.13%	0.0140
Injected drugs	55.6	35.6%	0.0027
≥daily injection	61.0	57.0%	0.4142
never shared needles	86.9	93.7%	0.1573
Median US$ amount (SD) spent on drugs on a typical day	$52.57 (58.47)	$46.71 (64.57)	0.001
Sexual Behaviours			
Median number (SD) of sexual contacts per month	10.0 (29.9)	3.0 (22.4)	0.010
Steady Male Partner			
always used condoms during steady partner vaginal sex	43.0	45.0%	0.739
($n = 14$)	29.0	29.0%	1.00
Casual Male Partner			
always use condoms during casual partner vaginal sex	36.0	21.0%	0.134
($n = 4$)	25.0	75.0%	0.157
Sex Trade Partners			
always use condoms during trade partner vaginal sex	100	71.0%	<0.0005
($n = 20$)	53.0	75.0%	0.03
Median number (SD) of sex trade partners per month	9.0 (23.6)	3.0 (42.4)	0.025

Notes:
+Unless indicated.
**P*-values obtained using Students t-test for matched observations for continuous data and Mcnemar's Test for categorical data.

reductions in sexual behaviours before compared to three months following the intervention, including: their median number of sexual contacts per month (10.0 vs. 3.0, respectively, $p = 0.010$); condom use during vaginal sex with sex trade partners (53.0% vs. 75.0%, respectively, $p = 0.03$); and participants' median number of monthly sex trade partners (9.0 vs. 3.0 respectively, $p = 0.025$). From baseline to follow up, 15% of participants reported a higher number of sex trade partners, 12.5% reported the same number of sex trade partners, and 72.5% reported fewer sex trade partners (data not shown).

Univariate and multivariate linear regression models

Univariate and multivariate linear regression models, located in Table IV, examined the correlates of the change in the number of sex trade partners from baseline to follow up. In the multivariate model, controlling for the women's score on the job self efficacy index and their expenditure on drugs at baseline, income from the jewelry sale was associated with a reduction in the number of sex trade partners at follow-up. Women who received $100 from jewel sale had eight less trade sex partners at follow-up compared to baseline. The results from the simulation analyses verified our results from the original dataset, indicating the validity of our results.

Discussion

The study describes a novel intervention that aimed to reduce women's drug and sex- related HIV risk behaviours as well as increase their belief in their ability to earn money through licit means by making, marketing and selling beaded jewellery. To our knowledge, this pilot study was the first to engage an active drug using population in such an economic enhancement project. The intervention's feasibility and acceptability was demonstrated by the amount of sales, the high attendance in the intervention, and the extent of the women's participation in the unpaid open-jewellery making sessions. Through the creation of an economically enabling environment in combination with enhancing women's HIV risk reduction skills, participants reduced selected sexual and drug-related HIV risk behaviours. Specifically, women reported significantly lower rates of non-injection (i.e. crack smoking) and injection drug use as well as a reduction in the number of all sexual partners and sexual trade partners. Compared to the baseline survey, women also reported significantly lower rates of illegal sources of income at follow-up. Additionally, in the presence of other variables, money earned through jewellery sales was associated with a significantly lower number of sex trade partners at follow-up.

One explanation for these reductions is the combined effects of women learning HIV risk reduction skills as well as the positive reinforcement and enhanced belief in their ability to generate licit employment. Given the evidence supporting the link between women's economic disadvantage, entry into trading sex for drugs or money, and diminished capacity for HIV risk reduction, it is plausible that women's risk behaviours would decrease with realization of alternative economic opportunities. While results from the current study suggest that women's exposure to the possibility of gaining licit employment may be related to risk behaviour change, behaviour change sustainability is most likely to succeed if women have access to job training programmes and licit employment opportunities.

JEWEL was not intended to be a 'job training' programme, rather it aimed to provide women with income-generating skills and the belief in their ability to participate in licit employment. Although JEWEL did not specifically focus on training in general job

Table IV. Univariate and multivariate linear regression model for the change in the number of monthly sex trade partners from baseline to follow-up, among JEWEL participants ($n = 50$).

	Bivariate Models			Multivariate Models		
Variable	Parameter Estimate	Standard Error	*P*-value	Parameter Estimate	Standard Error	*P*-value
Intercept	–	–	–	15.2	9.2	0.11
African American (vs. White)	20.6	14.9	0.20	–	–	–
Older age ($\geq$39 years of age*)	17.5	14.2	0.23	–	–	–
Ever dropping out of school	−13.9	14.8	0.35			
Income from jewellery sale ($USD)	0.09	0.04	0.033	0.08	0.03	0.013
Baseline job self-efficacy score*	21.4	9.04	0.024	10.5	7.3	0.16
Baseline drug expenditure ($USD)	−0.4	0.08	<0.0001	−0.3	0.08	0.0002
Daily drug use at baseline	25.1	15.5	0.11	–	–	–
Injection at baseline	5.3	14.5	0.72	–	–	–

Note:
*Centred at mean (2.54).

skills, women's participation in JEWEL increased their belief in their ability to successfully obtain and function at a job. Women's enhanced job self-efficacy was reflected in the significantly higher score at follow-up compared to baseline as well as the significant relationship, in the presence of other variables, between the score with a lower number of monthly trade partners at follow-up. This result would be strengthened if future studies examined the correlation between job self-efficacy scores and employment acquisition and maintenance. Although some of the 'higher earners' may have been better able to supplement other income sources with JEWEL proceeds, it was not our expectation that women would be able to survive on the income generated from the project. Rather, women's sense of employment and job training opportunities were enhanced by JEWEL participation. Although a higher proportion of women at follow-up compared to baseline reported having a part or full-time job, there was not sufficient power to detect a significant difference. Additionally, a longer follow-up time period would have provided a more meaningful portrait of the intervention's effects on patterns of both licit and illicit sources of income.

There are multiple benefits that could result from job training programmes that address the specific needs of drug users. Both street-recruited and treatment-based samples of drug users are largely unemployed (Sanders-Phillips, 2002; Silverman et al., 2002; Zanis et al., 1994). Within these populations, women have significantly lower average household incomes (Brady et al., 1993) and rates of employment and education (French et al., 1992) compared to men. Barriers to obtaining or maintaining employment may be the result of a combination of drug use and its associated lifestyle, a lack of education or training, and limited employment opportunities (Romero Daza et al., 2003; Weeks, et al., 1998). The majority of research regarding the role of employment and vocational training (Comeford, 1999) among drug users is in the context of drug treatment settings. By design, active drug users are ineligible for such programmes, resulting in a lack of understanding of the effects of job training participation on drug use.

JEWEL demonstrated that risk reduction could be augmented by enhancing HIV prevention and risk reduction skills and enhancing women's job self efficacy. Upon study completion, all remaining supplies and tools were donated to the most successful and enthusiastic JEWEL participant who continues to hold weekly jewellery-making classes. Anecdotally, four JEWEL participants and four new women have continued making and selling jewellery beyond the study period. The four JEWEL participants both recruited the new women and trained them. As of 22 months after the last study-sponsored sale, they have had a number of sales at local markets and fairs and have begun to sell pieces on the internet. This demonstrates the feasibility of the longer-term viability of such an economic endeavour with the target population as well as women's interest and ability to be involved in licit income generating opportunities.

Results of the current study must be viewed in light of several limitations pertaining to both the study design and intervention. First, the small number of study participants prevented evaluation of the intervention's effects on important but relatively rare behaviours such as condom use with steady and casual partners and inhibited our ability to utilize multivariate modelling of drug use patterns. Second, the lack of a control group prevented our teasing a part the effects of the HIV prevention and jewellery-making components on behaviour change. But the data were systematically structured, signifying the intervention altered predicted factors rather than solely influencing nonspecific ones such as socially desirability. In the multivariate model, the amount of money earned from the intervention was significantly related to a decreased number of sex trade partners from baseline to follow-up, suggesting that jewellery-making component contributed to the outcome beyond the HIV-related components. Third, the study's internal validity is threatening by social desirability due to the sensitive nature of some of the survey questions regarding sexual and drug-related risk behaviours. The combined experienced of the interviewers combined with the repetition of several sexual and drug-related questions in the surveys aimed to minimize this bias. Additionally, studies on self-reported HIV-risk behaviours of IDUs have found self-reports of both sexual and drug use variables to be reliable (Darke, 1998; Goldstein et al., 1995). Additionally, the three-month follow-up period does not speak to the sustainability of behaviour change and significant results could be partially attributed to regression towards the mean. A larger study with more participants, a more rigorous design, and several follow-up periods over a longer period of time is needed to expand the current findings.

We did not examine the complex range of factors that could be related to women's involvement in trading sex. Such intrapersonal factors as early childhood trauma, psychiatric disorders, and experiences of violence could be directly related to women's involvement in both drug use and transactional sex. The survey did not measure and the intervention did not address these issues that might be powerful forces in keeping them entrenched in this deleterious lifestyle. The intervention characterized by several limitations. First, although the

intervention aimed to examine the viability of an HIV prevention and interest in an income-generating endeavour, the women's long-term economic needs were not specifically addressed.

Economic enhancement can enhance the lives of urban, drug using women involved in trading sex in a myriad of ways. The current study, though modest in size, demonstrates the potential for enhancing women's health behaviours, their belief in their abilities to generate licit income, and their self efficacy in obtaining and maintaining employment. JEWEL's success, as evidenced both in the participants' involvement as well as its affects on sexual risk taking and drug utilization patterns shows the feasibility of interventions that aim to change the structure of women's lives. Through intercepting the 'nexus of risk' (O'Leary, 2001) that both directly and indirectly shape women's risk behaviour, behaviour change sustainability could be achieved.

This pilot study is a first step in developing a comprehensive HIV prevention intervention that addresses economic disadvantage as an HIV risk factor. Intervening on this level not only serves the public health aim of reducing HIV in this population, but addresses low income populations' desire to ameliorate their economic circumstances.

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