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Drug problems and "at risk" women's involvement in HIV risk behaviors

Summary

Objectives: This paper focuses on two research questions: Is there a relationship between women's number of drug problems and the extent to which they engage in HIV risk behaviors? What factors influence the extent to which women experience drug-related problems?

Methods: This study is based on 250 adult "at risk" women (predominantly African American) in the Atlanta, Georgia metropolitan area. Street outreach efforts, targeted sampling, and ethnographic mapping procedures were used to identify potential study participants.

Results: The more drug problems women experienced, the greater their involvement in HIV risk behaviors was. The number of drug problems experienced was a significant contributor to the model predicting women's HIV risk involvement, along with religiosity, living with substance abusers, and age of first drug use. Depression, optimism, coping with stress, and number of different drugs used predicted the extent to which women experienced drug problems.

Conclusions: Drug problems are an important predictor of women's involvement in HIV risk behaviors. Programs wishing to reduce their risk for contracting HIV should target drug-involved women and help them to stop using drugs.

Keywords: **Drug problems – Drug dependency – Drug abuse – HIV/AIDS – Risk behaviors – Women.**

The link between substance abuse and HIV risk has been well-established in the scientific literature. Substance abusers have been found to have high rates of HIV seropositivity when compared with people who do not use drugs (Collier et al. 1998; McCoy et al. 1999; Warner & Leukefeld 1999), and a disproportionately-large number of AIDS diagnoses have been linked either directly or indirectly to substance abuse (Centers for Disease Control and Prevention 2002). In this regard, much has been written about the HIV risks associated with injection practices such as sharing cookers, cottons, rinse water, and/or syringes (McCoy et al. 1998; Nemoto 1992; Thorpe et al. 2001), all of which may contain HIV and facilitate transmission of the virus. Risky sexual behaviors, too, have been shown to be more common among substance abusers – particularly crack cocaine abusers and/or injection drug users – compared to people who are not drug abusers (Hoffman et al. 2000; Liebman et al. 1992; Rasch et al. 2000).

Despite this body of knowledge focusing on the nexus of drug abuse and HIV risk, relatively little has been written about the relationship between the *extent* of substance abuse-related problems and actual HIV risk behavior practices. For example, do people who use drugs infrequently and without problems engage in risky behaviors to the same extent as drug users who use more frequently and incur problems resulting from their use? If we think of "number of drug problems experienced" (which is the key variable used in the analyses conducted in the present paper) as a proxy for the extent of one's drug abuse or drug dependency, then the research issue of importance here is the extent to which intensity of drug abuse or intensity of drug dependency has an impact upon HIV risk behavior practices. Research studies generally have found that AIDS-related knowledge is high among drug abusers (Connors 1995; Liebman et al. 1992; Nadeau et al. 2000; Silbersiepe & Hardy 1997) and that many of these individuals continue to engage in risky behaviors despite having a fairly good understanding of the risks they face (Connors 1995; Silbersiepe & Hardy 1997). In light of these findings, logic would dictate that the need for drugs – be it psychological in nature, physiological in nature, or both – fuels many drug abusers' risky practices. Furthermore, we might expect that the greater their need for drugs, the more likely people will be to make careless decisions and engage in risky behaviors.

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The present study examines this issue in a sample of urban, predominantly African American women. The main research questions here are: (1) Is there a relationship between the number of drug problems women experience (construed as a proxy variable for the extent of their drug abuse/dependency level) and the extent to which they engage in risky behaviors? (2) If there is such a relationship, does this relationship "hold up" when examined in a multivariate equation predicting overall risk behavior practices? (3) What factors influence the extent to which women experience drug-related problems?

Methods

Overview and sample

The data for this study came from Project FAST, which was conducted between August 1997 and August 2000 in the Atlanta, Georgia metropolitan area. One of the principal goals of this study was to examine life issues and challenges, substance use, psychological and psychosocial functioning, and a variety of HIV-related risk behaviors among adult "at risk" women. "At risk" was defined broadly as experiencing any combination of a variety of life challenges, including, among others, the following seven characteristics. First, all of the women lived in areas known for having high rates of drug abuse (see below). Second, most (68%) were either active users of illegal drugs and/or had an immediate family member who was a substance abuser. Third, being impoverished was typical for women in this study. The median annual personal income was USD 4 200 and the median annual household income was approximately USD 9 600, both of which are well below the federally-established poverty line. Fourth, a sizable proportion of Project FAST women lacked adequate medical care and/or related insurance. During the preceding year, 20% of the women reported not receiving needed medical care and 30% said that they were not covered by health insurance of any kind. Fifth, low education levels typified this sample, with 40% of the participants having not completed high school or its equivalent. Sixth, employment problems were common among women in Project FAST, such that 39% were unemployed and 9% were unable to work due to disability. Finally, many of these "at risk" women had a criminal history. Half had been arrested at least once before and more than half of the arrested women (57% of them) had been arrested two or more times. A sizable proportion of the women who had been arrested (36%) reported that their most recent arrest had taken place during the preceding year. As all of the preceding information indicates, the "at risk" women who took part in Project FAST tended to experience challenges and difficulties in a variety of domains in their lives.

In all, 250 women participated in this study. Most (88%) were racial minority group members, predominantly African American. The median age was 35 (mean = 35.3, s.d. = 13.2, range = 18–72). About half (53%) of the women were single and one-quarter (25%) were married or living as married at the time of their interview. Readers interested in learning more about Project FAST and some of its other findings may wish to consult some of our recent works. These papers focus on the relationship between religiosity and HIV risk (Elifson et al. 2003), HIV risk behaviors among women perceiving themselves to have zero risk for contracting HIV (Klein et al. 2003a), perceived temptations to use illegal drugs and actual drug usage (Klein et al. 2003b), and condom use self-efficacy and HIV risk (Sterk et al. 2003).

Eligibility

In order to participate in the study, several eligibility criteria had to be met. Each woman had to live in one of the study's catchment areas. She had to be aged 18 or older and be able to conduct her interview in English. In addition, in order to ensure that a noninstitutionalized sample was obtained, women could not be enrolled in a substance abuse treatment program, incarcerated in a prison or jail, or be living in any other institutional setting at the time of their participation.

Recruitment

Women were recruited into the study by outreach workers, who conducted initial screening interviews "on the street" to confirm potential participants' eligibility for the study. The initial recruitment was based largely on targeted sampling, including ethnographic mapping (Sterk 1999; Watters & Biernacki 1989). The targeted neighborhoods were chosen because of their concentration of "at risk" women. These communities were "hot spots" of local drug activity characterized by frequent drug sales and widespread drug use. Within these community "hot spots," the outreach workers targeted places where "at risk" women were known to gather (e.g., laundromats, stores, playgrounds, churches, and activity centers), so as to maximize their recruitment efforts.

As the study progressed, a chain referral sampling technique was used to identify additional participants. After completion of the interview, each woman was asked to refer the research team to other women who might be interested in participating in the study, but such referrals were provided strictly on an unpaid, voluntary basis. On average, interviews took two hours to complete. At the completion of the

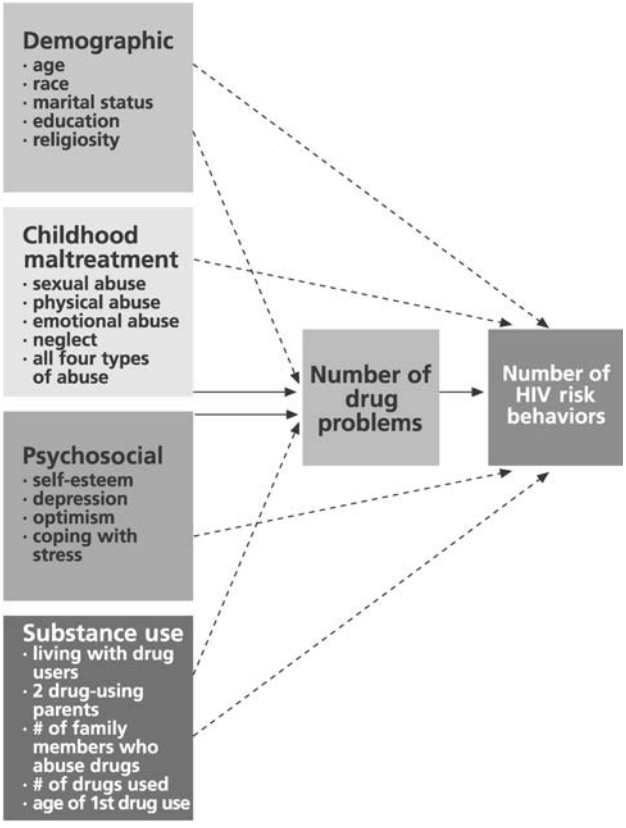

Figure 1 The conceptual model being tested

interview, each woman was paid USD 15 for her participation and offered referrals to local health/social service agencies, as appropriate.

Measures used

All of the data in Project FAST were based on self-reports. In the first part of the analyses, the number of drug problems experienced during the past year was the dependent variable. This was a composite measure based on responses to ten substance abuse and substance dependency measures, as specified in the DSM-IV (American Psychiatric Association 1994). These included: (1) hiding when using drugs, (2) receiving complaints from significant others about one's drug use, (3) using drugs in situations that were made dangerous by the drug use, (4) having drug-related legal problems, (5) continuing to use drugs despite knowledge that it could cause fights or legal problems, (6) needing to use more drugs to achieve the same effect, (7) experiencing withdrawal symptoms, (8) using larger amounts of drugs or for longer periods than originally intended, (9) being unable to reduce or stop using drugs, and (10) spending a lot of time getting, using, or feeling the effects of drugs. One point was added to the overall scale for each symptom experienced. The scores could range from 0 to 10, and the scale was found to be reliable (Cronbach's alpha = 0.91).

In the second part of the analyses, the number of different HIV risk behaviors practiced during the preceding year served as the dependent variable. Scores on this composite measure could range from 0 (no risk during the previous year) to 8 (engaged in all of the named risk behaviors during the previous year). One point was added to the scale for each of the following items: (1) had sex while high or while partner was high on alcohol or other drugs, (2) had sex with an injection drug user, (3) had anal intercourse, (4) had sex with a man who might have had sex with other men, (5) traded sex for drugs, gifts, or money, (6) purchased sex with drugs, gifts, or money, (7) had multiple sex partners, and (8) had unprotected sex of any kind. The Kuder-Richardson-20 reliability coefficient for this scale was 0.61.

The principal aim of these analyses was to examine the role that drug problems play in affecting women's HIV risk behavior practices. A path analysis model was created (see Fig. 1) and tested, and the number of drug problems experienced was considered an intermediate variable in the model. That is, we hypothesized that a variety of factors (including specified demographic variables, childhood maltreatment experiences, psychosocial influences, and substance abuse-related measures) would be predictive of the extent of women's drug problems, and that their drug problems, in turn, would predict their involvement in HIV-related risk behaviors.

To test these hypotheses, we looked at a number of variables that might be associated with drug problems and HIV risk behavior involvement. The items chosen for consideration (see Fig. 1) were based on our conceptual model, as shown in Figure 1, and based on the findings of numerous published studies indicating the relevance of these factors to understanding differences in these measures among women. For example, many published reports have shown that drug use and HIV risk vary based on a variety of *demographic characteristics* (Compton et al. 2000; Mize et al. 2002; Schoeneberger 2001); and on that basis, we felt that such measures ought to be included in our analysis. Demographic variables that we used included age (coded as a continuous variable), race (coded as African American or other-than-African American), educational attainment (coded as less than high school graduate, high school graduate or equivalent, and at least some college education), marital status (coded as married or living as married versus other-than-married), and religiosity (a continuous measure coded as the interaction between the perceived importance of one's religious beliefs on one's behaviors and the frequency of worship service attendance).

Similarly, a fairly-sizable body of research has emerged in recent years showing that *childhood maltreatment experiences*

have an adverse effect on people's lives continuing into their adulthood years, including being linked to elevated rates of drug abuse and HIV risk practices (MacMillan et al. 2001; Mullings et al. 2000; Robert et al. 2003). Accordingly, we deemed it important to examine childhood maltreatment variables in our analyses. Here, we examined included sexual abuse, physical abuse, emotional abuse, neglect, and one additional measure that indicated whether or not the person had been victimized in all four of these ways. All four of these measures were based on experiences prior to age 18 and were coded as "happened" or "did not happen". These constructs were assessed using items from Bernstein et al.'s (1994) *Childhood Trauma Questionnaire.*

Four *psychosocial measures* were also examined, including self-esteem (a continuous scale measure based on Rosenberg's (1965) self-esteem scale) (Cronbach's alpha = 0.84), depression (a continuous scale measure based on *the Depression and Anxiety Stress Scale 42 [DASS 42]* developed by Lovibond & Lovibond (1995)) (Cronbach's alpha = 0.86), optimism about the future (a continuous scale measure derived from five items) (Cronbach's alpha = 0.64), and coping with stress (a continuous scale measure derived from the *Ways of Coping Questionnaire* (Folkman & Lazarus 1988)) (Cronbach's alpha = 0.63). Again, the psychosocial measures were chosen for examination because of their relevance to our conceptual model and because published studies have shown them to be related to HIV risk and/or drug-use practices (Morrill et al. 1996; Schroeder 2001; Stein & Nyamathi 1999; Taylor & Del Pilar 1992).

Five *substance abuse-related* measures were also included in the analyses. These were living with any person(s) using illegal drugs (coded yes/no), having two parents with substance abuse problems (coded yes/no), the number of family members with alcohol and/or other drug problems (a continuous measure), the number of different types of illegal drugs used (a continuous measure), and age of first drug use (a continuous measure). Such measures were included in the analysis because of the many published studies demonstrating a linkage between drug use/abuse and HIV risk practices (e.g., Longshore & Anglin 1995; Miller & Neaigus 2002).

Analysis

We approached these analyses in three parts, following a path analysis strategy. In the first part, we examined predictors of women's number of drug problems. Bivariate analyses were conducted between each of the hypothesized predictor variables shown in Figure 1 and the "number of drug problems" dependent measure. Student's t-tests were used whenever the independent variable was dichotomous in nature (e.g., race, marital status). Analysis of variance was used whenever the independent variable was categorical in nature or ordinal with fewer than five response levels (e.g., educational attainment). Simple regression was used for all independent variables that were continuous (e.g., religiosity, self-esteem, age of first drug use). Items that were found to be statistically-significant predictors in these bivariate analyses were selected for entry into the multivariate equation.

Next, a stepwise multiple regression approach was used to examine the relationship between the selected predictor variables and women's number of drug problems. Variables were entered into the multivariate equation in a stepwise fashion, based on the categories shown in Figure 1. The order in which they were entered was demographic, childhood maltreatment, psychosocial, and substance use, respectively. To make sure that the order in which items were considered for inclusion in the development of the final multivariate equation was not influencing the results obtained, the analyses were conducted using a stepwise procedure, a forward selection procedure, and a backward selection procedure. The same results were obtained in the final model regardless of which approach was adopted. Items that were statistically significant or marginally significant during each step of the construction of the multivariate equation were retained in subsequent steps. To make sure that "masking effects" were not overlooked in performing these analyses, all marginally-significant items (i.e., those found to be significant at $p < 0.15$) were included in these equations as well. Those that did not meet the significance level criterion were deleted from the model and excluded from further consideration.

For the second part of the analyses, the same approach was adopted, except the "number of HIV risk behaviors" measure replaced the "number of drug problems" variable as the dependent variable in the equations. Additionally, the "number of drug problems" item became one of the predictor variables considered, since the relationship between that measure and HIV risk behavior practices was the central focus of the present analyses.

In the third part of the analysis, we wanted to examine the overall fit of the model derived. To do this, we used structural equation modeling, relying upon Amos 4.0 to perform the analytical testing (Arbuckle & Wothke 1999). With this approach, we are able to assess the goodness-of-fit of the model and the root mean square error approximation (RMSEA). In order for a model to be said to be a good "fit" for the data, the goodness-of-fit index should be greater than 0.9 (the closer to 1.0 it is, the better), the chi square test statistic should be nonsignificant (the farther below the critical value for attaining statistical significance it is, the better), and the RMSEA value should be less than 0.05 (here, the

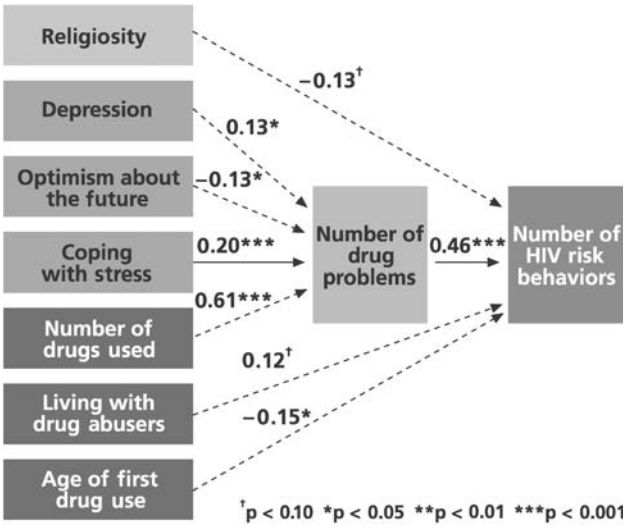

Figure 2 Drug problems and HIV risk behaviors

farther below 0.05 it is, the better). Results are reported as statistically significant whenever $p < 0.05$.

Results

Predicting number of drug problems experienced

Figure 2 presents the final results of the structural equation analysis we conducted. Four variables were found to be significant predictors of the number of drug problems that women experienced: level of depression, level of optimism about the future, ability to cope with everyday stresses, and the number of different drugs that they reported using. The more depressed women were, the greater their number of drug problems tended to be ($p < 0.05$). Moreover, the more optimistic they were about the future, the fewer drug problems they typically reported ($p < 0.05$). Coping skills were found to be associated inversely with drug problems, such that women who coped better with everyday stresses reported fewer drug problems than those whose coping skills were not as strong ($p < 0.001$). Finally, the greater the number of different drugs that women used, the more drug problems they tended to experience ($p < 0.001$). Together, these four variables accounted for 55% of the variance in the number of drug problems that women experienced.

Predicting number of HIV risk behaviors practiced

Figure 2 also shows the results obtained for predicting the number of HIV risk behaviors women practiced. Again, four predictors were identified: religiosity, the number of drug problems that women reported, living with a substance abuser, and the age of first drug use. The data revealed that the more religious women were, the less they tended to be involved in HIV risk practices ($p < 0.05$). The number of drug problems women experienced – the key variable of interest in these analyses – was found to be the strongest predictor by far of their involvement in HIV-related risky behaviors. The more drug problems women experienced, the greater their practice of risky behaviors tended to be ($p < 0.001$). Also, the younger women were when they began using drugs, the greater their involvement in HIV risk practices tended to be as adults ($p < 0.05$). The variable "living with substance abusers" also appears in the path model, suggesting that women who lived with substance abusers engaged in somewhat more HIV risk behaviors than women who did not live with substance abusers. Although this variable itself was not found to be only a marginally-significant contributor in the overall prediction equation, it was retained because its removal from the model caused other variables contained in the model to become nonsignificant. Together, these four items explained 40% of the total variance in women's involvement in HIV-related risk behaviors.

Assessing the overall fit of the model

When the model derived from the preceding analyses (i.e., the model shown in Fig. 2) was subjected to structural equation analysis, the results indicated that this model fits the data very well. The overall goodness-of-fit index was 0.99, indicating a strong fit with the data. The RMSEA had a value of 0.03, which is well below the upper limit value of 0.05 necessary to consider the model suitable. The chi square test yielded a value of 1 296 with 7 degrees of freedom, which is well below the chi square value of 14 067 that would indicate a relationship that attained statistical significance. Overall, then, these data indicate that the path model derived in this study, as shown in Figure 2, is an excellent representation of the relationships contained in our research data.

Discussion

One of the principal aims of the present study was to address the question "Does the number of drug problems that women experience predict their involvement in HIV-related risk behaviors?" The answer is an unequivocal "yes." As Figure 2 (which presents the final results of the analyses conducted in this study) indicates, this was the single most influential variable affecting women's risk behavior practices. An examination of the standardized regression coefficient associated with it ($\beta = 0.46$) shows that this variable was approximately three times more consequential than the next-most-important variable in the model (age of first drug use).

Considering that the items comprising the "number of drug problems" measure include items representing the diagnostic criteria for substance abuse and substance dependency, the main significance of this finding is that women whose drug use is causing them to experience extensive drug problems are far more likely than women with fewer drug problems to engage in HIV risk behaviors. Other researchers have also reported an association between the degree or intensity of drug dependency and the number of HIV risks taken by their study participants (Gossop et al. 1993a; 1993b; Morrill et al. 2001). Their findings and ours suggest that helping substance abusers whose drug use has reached a point where it is interfering with their interpersonal relationships and daily lives to enter drug treatment could be a promising way of helping these individuals to reduce their HIV risk. A number of studies have shown that entry into drug treatment can be effective at helping people to reduce their HIV risk practices (Dushay et al. 2001; Hoffman et al. 1998; Longshore & Hsieh 1998; Woods et al. 1999). Our findings also indicate that this would be a worthwhile endeavor.

Coinciding with this, the present study also corroborated the research finding that the age at which women used drugs for the first time was a significant predictor of their involvement in risky behaviors (see Fig. 2). The earlier they began using drugs, the more involved in HIV risk they were as adults. A number of previous studies have reported that earlier initiation of drug use is associated with a greater likelihood of developing substance abuse problems (Labouvie et al. 1997) and, among those who enter drug treatment, with a greater likelihood of relapsing (Marshall et al. 1994). Early-onset drug use has also been linked with subsequent involvement in delinquent activities, poor adjustment in adulthood, increased likelihood of dropping out of school, and poor psychosocial functioning (Fergusson & Horwood 1997; Franken & Hendriks 2000; Tubman et al. 1990). The present research findings complement these studies by documenting yet another reason for concern associated with early onset drug use – namely, its association with greater HIV risk practices. This finding suggests to us that prevention programs need to continue to target young people to keep them from becoming drug abusers. If successful, such programs would not only spare people the multiplicity of harms resulting directly from their drug use but also additional problems that may ensue from their drug use, such as greater involvement in HIV risk behaviors.

In addition to establishing the relationship between the number of drug problems experienced and HIV risk behavior involvement, one of the other aims of the present study was to examine what factors influence the number of drug problems women experienced. In all, four measures were identified as being significant in a multivariate analysis (see Fig. 2). Together, these items did an excellent job of accounting for differences in the extensiveness of women's drug problems, explaining more than half of the variance in this dependent measure. Three of these measures were psychosocial variables: depression, optimism about the future, and coping with stress. Not surprisingly, more drug-related problems were reported by women who were more depressed, less optimistic about the future, and less able to cope with stress in a positive manner. Based on these findings, we believe that intervention programs targeting substance abusers would be wise to incorporate psycho-educational components aimed at alleviating depression, bolstering positive outlooks toward the future, and fostering adaptive coping strategies and improved coping skills. Numerous published studies support these three recommendations. For example, with respect to depression, research has shown that depression is associated with relapse among alcohol-addicted men (Strowig 2000) and that reducing depression during the treatment process has led to better treatment outcomes for methadone maintenance patients (Avants et al. 2000). Presumably, this would apply to other types of drug abuse outcomes too. Regarding optimism/pessimism, researchers have reported that success in substance abuse treatment was greater among people who scored lower on measures of pessimism[1] (Bishop et al. 1998; Goldbeck et al. 1997), and that greater pessimism is associated with greater amounts of drug use (Prescott et al. 1997). By working with women to reduce their level of pessimism about their daily lives, we would expect to see their rates of drug use (and by association, their rates of drug-related problems) decline. Finally, with regard to coping skills, a number of studies have shown that enhancing coping skills is likely to lead to reduced drug use (Avants et al. 2000; Bish et al. 1996; Monti et al. 1997). By focusing their efforts on improving substance abusers' psychological and psychosocial functioning, intervention programs are likely to enable their participants to reduce the toll that drug abuse takes on their lives. This, in turn, has a good chance of having the additional beneficial effect of leading to reductions in HIV risk behavior involvement, as the present study has shown a strong association between the number of drug problems experienced and women's involvement in risky behaviors.

The final point we would like to discuss pertains to our finding regarding polydrug abuse–namely, that is was associated

[1] Since optimism and pessimism are ostensibly opposites of one another, some studies included measures focusing on one construct rather than the other. Our assumption is that lower levels of optimism equate with greater levels of pessimism, and that lower levels of pessimism equate with greater levels of optimism.

strongly with the extensiveness of drug problems women experienced. The greater the number of different drugs women used, the more problems they experienced. Other researchers have obtained similar results in their work as well (Harrell et al. 1991; Marsden et al. 2000; Shillington & Clapp 2001). Undoubtedly, this relationship is, at least to some extent, a reflection of the progressive nature of drug dependency. That is, as people become increasingly dependent upon drugs, they become more willing to use a greater variety of drugs to satisfy their physiological needs for drugs and their psychological desires to find new ways to get high. Polydrug abuse leads to complex behavioral patterns of drug-seeking behaviors, varying drug-using rituals (since different drug types tend to be used in different settings, under different circumstances, for different reasons, and sometimes with different people), and an array of physical complications resulting from the use and abuse of the various substances. This makes treating polydrug-abusing and polydrug-addicted persons particularly difficult (Rowan-Szal et al. 2000), because extinguishing the use of one drug in a polydrug abuser's substance abuse repertoire does not necessarily lead to the cessation of use of his/her other drugs of abuse. In fact, for most dually-addicted persons, separate skill sets are needed to overcome each different drug being abused.

Applied to the present research findings, there appears to be a particularly-pressing need to reduce polydrug abuse, especially when one considers how closely this phenomenon was related to the number of drug problems women experienced. Our findings suggest that reducing the number of different drugs that women use is likely to lead to reductions in the extent to which their lives are disrupted by drug abuse. And as we have pointed out earlier in this work, reducing the number of drug problems that women experience is likely to lead to further improvements in their lives, in the form of engaging in fewer HIV-related risk behaviors. Feilgelman et al. (1998) also noted an association between polydrug abuse and risk-taking behaviors and concluded that comprehensive drug rehabilitation services are necessary to improve the lives and health behaviors of polydrug abusers. Based on the present research, we concur with these authors and share in their recommendation.

Potential limitations of this research

We would like to acknowledge a few potential limitations of this research. First, the data collected as part of Project FAST were all based on uncorroborated self-reports. Therefore, the extent to which respondents underreported or overreported their involvement in risky behaviors is unknown. In all likelihood, the self-reported data can be trusted, as numerous authors have noted that persons in their research studies (which, like the present study, have included fairly large numbers of substance abusers) have provided accurate information about their behaviors (Anglin et al. 1993; Higgins et al. 1995; Miller et al. 1990; Nurco 1985).

A second possible limitation pertains to recall bias. Respondents were asked to report about their beliefs, attitudes, and behaviors during the past 30 days, the past 90 days, and the past year, depending upon the measure in question. These time frames were chosen specifically (1) to incorporate a large enough amount of time in the risk behavior questions' time frames so as to facilitate meaningful variability from person to person, and (2) to minimize recall bias. The exact extent to which recall bias affected the data cannot be assessed although other researchers collecting data similar to that captured in Project FAST have reported that recall bias is sufficiently minimal that its impact upon study findings is likely to be small (Jaccard & Wan 1995).

A third possible limitation of these data comes from the sampling strategy used. All interviews were conducted in the Atlanta, Georgia metropolitan area. There may very well be local or regional influences or subcultural differences between these women and those residing elsewhere that could affect the generalizability of the data. Additionally, the chain referral sampling approach used to identify study participants is not a random sampling strategy, and there may be inherent biases in who was/not identified as potential study participants in Project FAST. A good discussion of the issues pertinent to this concern may be found in Heckathorn (1997), along with strategies that can be employed to minimize any bias that could result from the use of a chain-referral sampling approach.

Fourth, because of the cross-sectional nature of the study design, temporal ordering of some of the relationships reported in this research is difficult to establish. This is especially true for the psychosocial measures and their relationship to the "number of drug problems experienced" and "number of HIV risk behaviors practiced" outcome variables. It is possible that the psychosocial variables precede the behaviors in question and, therefore, influence them; it is possible that women's behavioral practices affect the way they function psychologically and psychosocially; and it is possible that these variables have a recursive relationship with one another. Previous research findings support all three of these interpretations and the design of Project FAST makes it impossible to determine causality in the relationships observed amongst these measures.

Finally, there are a few inherent limitations in the use of the structural equation modeling approach that we adopted to test the overall goodness-of-fit. First, the Amos procedure only provides goodness-of-fit measures when there are no

missing data for any of the variables included in the path model being tested. In order to be able to perform the structural equation analysis with the associated goodness-of-fit measures, we had to use imputed data for 82 cases for the "age of first drug use" variable, since many of the women in this study reported never having used illegal drugs in their lives. To do this, we used a mean substitution approach. This approach enabled us to perform the assessment of the overall model, but the values substituted for these particular study participants were artificial, based on the sample mean values for this variable. While the exact extent to which this may have influenced the results derived by the structural equation model cannot be assessed, the coefficients for this model are very similar to a model based on path coefficients that were computed using ordinary least squares regression analysis. Second, as part of its analysis, Amos indicates a minimum sample size necessary for its analysis to be valid. For these particular analyses, the sample size needed was 387, which is greater than the number of women available in this study. Therefore, we recommend that readers interpret the structural equation results with caution. Since the structural equation results strongly supported our derived model, because the sample size was too small to perform a "proper" structural equation analysis, we think that it is best to consider these findings generally supportive of the relationships shown to exist based on the first two parts of our analysis.

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Zusammenfassung

Drogenprobleme und das HIV-Risikoverhalten von gefährdeten Frauen

Fragestellung: Wir konzentrieren uns auf zwei Fragestellungen: Besteht für Frauen ein Zusammenhang zwischen der Anzahl Drogenprobleme und dem Ausmass, in dem sie ein HIV-Risikoverhalten aufweisen? Welche Faktoren beeinflussen das Ausmass, in dem Frauen drogenabhängige Probleme haben?
Methoden: Die Studie beruht auf Daten von 250 gefährdeten erwachsenen Frauen (vor allem Afro-Amerikanerinnen) im Grossraum von Atlanta, GA (USA). Zur Identifizierung der potentiellen Studienteilnehmer wurden berücksichtigt: offen zugängliche Beratungsangebote, gezielte Stichprobenerhebung und ethnographische Kartographieverfahren.
Ergebnisse: Je mehr Drogenprobleme Frauen hatten, umso häufiger praktizierten sie mit einem HIV-Risiko verbundene Verhaltensweisen. Die Anzahl bestehender Drogenprobleme war ein bedeutender Faktor im Modell, welches das Risikopotential der Frauen voraussagte, zusammen mit Religiosität, der Tatsache mit Drogenabhängigen zusammen zu leben und dem Alter zum Zeitpunkt des ersten Drogenkonsums. Die Faktoren Depression, Optimismus, Stressbewältigung und die Anzahl verwendeter Drogen lieferten die Grundlage zur Einschätzung, in welchem Ausmass Frauen Drogenprobleme haben.
Schlussfolgerungen: Drogenprobleme sind eine wichtige Hinweisgrösse auf ein HIV-Risikoverhalten bei Frauen. Programme mit dem Ziel, das Risiko einer HIV-Ansteckung zu reduzieren, sollten Frauen im Drogenmilieu ansprechen und ihnen Unterstützung beim Ausstieg aus den Drogen bieten.

Résumé

Toxicomanie et implication de femmes „à haut risque" dans des comportements à risque pour le VIH

Objectifs: Cet article porte sur 2 questions: 1) Y a-t-il une relation entre le nombre de problèmes de toxicomanie chez une femme et la probabilité qu'elle ait un comportement à risque pour le VIH? 2) Quels sont les facteurs qui influencent la toxicomanie chez les femmes?
Méthodes: Cette étude est basée sur 250 femmes adultes "à risque" (surtout africaines américaines) dans la région métropolitaine d'Atlanta, en Géorgie. Les participantes potentielles à l'étude ont été identifiées grâce à un recrutement de rue, un échantillonnage et des procédures de cartographie ethnographique.
Résultats: Une plus grande toxicomanie est associée à un plus grand comportement à risque pour le VIH. Le nombre de problèmes de toxicomanie est un facteur prédictif significatif de comportement à risque pour le VIH, de même que la religion, le fait de vivre avec des toxicomanes, et l'âge du début de la toxicomanie. Dépression, optimisme, gestion du stress et nombre d'autres drogues utilisées sont aussi des prédicteurs de l'expérience toxicomaniaque d'une femme.
Conclusions: La toxicomanie est un prédicteur important de comportement à haut risque de VIH. Les programmes de prévention des infections à VIH devraient cibler les femmes toxicomanes et les aider à mettre fin à leur toxicomanie.

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