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## Pregnancy and Race/Ethnicity as Predictors of Motivation for Drug Treatment

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### Abstract

While drug use during pregnancy represents substantial obstetrical risks to mother and baby, little research has examined motivation for drug treatment among pregnant women. We analyzed data collected between 2000 and 2007 from 149 drug-using women located in Baltimore, Maryland. We hypothesized that pregnant drug-using women would be more likely than their non-pregnant counterparts to express greater motivation for treatment. Also, we explored race/ethnicity differences in motivation for treatment. Propensity scores were used to match a sample of 49 pregnant drug-using women with 100 non-pregnant drug-using women. A factor analysis using 11 items from a readiness for treatment scale was used to create a dichotomous outcome variable representing higher and lower levels of motivation for treatment. The first logistic regression model indicated that pregnant women were more than four times as likely as non-pregnant women to express greater motivation for treatment. The second logistic regression analysis indicated a significant interaction between pregnancy status and race/ethnicity, such that white pregnant women were nearly eight times as likely as African-American pregnant women to score higher on the motivation for treatment measure. These results suggest that African-American pregnant drug-using women should be targeted for interventions that increase their motivation for treatment.

### Keywords

Pregnant drug-users; race/ethnicity; motivation for treatment

## INTRODUCTION

Among pregnant women in the United States, approximately 4.0% reported illicit drug use in the previous month (1). While drug use during pregnancy can lead to a host of adverse neonatal outcomes (2,3), methadone maintenance treatment can significantly improve the health of mothers and infants (3,4)

Enrollment in methadone maintenance programs may depend on motivation, which is a construct comprised of three dimensions, including drug problem recognition, desire for help, and treatment readiness (5–7). Motivation is also a central construct in the Stages of Change model, which describes the stages through which people progress in the process of adopting behavior change (8). In empirical studies, motivation has been associated with treatment enrollment, (9,10), positive therapeutic engagement, and treatment completion (11–14). Researchers have found racial/ethnic differences in motivation for drug treatment such that while African Americans may express greater interest to quit using drugs (10), they are

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significantly less likely than non-African Americans to be enrolled in treatment programs (15,16), suggesting substantial barriers to treatment enrollment (17).

The purpose of this study was to compare motivation for drug treatment between two groups of drug-using women who were matched on pregnancy status (i.e. pregnant vs. non-pregnant) through the use of propensity scores. While previous studies targeting this population have primarily focused on HIV-risk behaviors (18,19) and treatment retention (20–23), there are no studies, to our knowledge, that address motivation for treatment among pregnant drug-using women. We hypothesized in our study that pregnant drug-using women would report greater motivation for treatment compared to the non-pregnant women. In addition, we examined the effect of race/ethnicity, comparing white and African-American pregnant drug users with regards to their expressed motivation for treatment. In the regression analyses, we also included years of drug use (10,15) and frequency of injection (15), both which have been shown to covary with motivation for treatment.

## METHODS

### Participants

Data for this study came from the International Neurobehavioral HIV Epidemiologic Study and the ADAPT IFCBT for HIV Prevention Study, both of which were longitudinal studies assessing social and behavioral risk factors for HIV and hepatitis A, B, and C. The sample for the present analyses included baseline data from 49 pregnant women and 100 matched controls, all of whom were either African American or white participants in one of the two studies.

### Procedures

The protocols for the two studies were approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board. Multiple recruitment strategies for obtaining participants included street outreach, advertisements in local newspapers, outreach at local needle exchange sites, and referrals from local service agencies and enrolled participants. Before participating, respondents gave informed consent and permission for follow-up contacts. Participants were paid \$45 for the baseline assessment, \$10 for locator visits, and \$55 for follow-up interviews.

### Measures

The HIV-Risk Behavior Interview used in these studies was adapted from a similar interview used for the REACH project (24) and included questions on demographic variables in addition to medical, educational, and neurodevelopmental histories. Questions assessed history of STDs and detailed behavioral information about drug use and sexual practices.

**Dependent Variable**—Motivation for drug treatment was assessed with an 11-item treatment readiness scale, with response options from 1 = strongly disagree to 4 = strongly agree. These eleven items included questions measuring recognition of drug use as a problem (e.g. “Your drug use is more trouble than it’s worth”), recognition of the need for treatment (“Being in drug treatment would help you with a lot of your problems”), and readiness to enter treatment (“You would like to get into drug treatment”)<sup>1</sup>. Participant responses were summed and the resulting scale was dichotomized using a median split to create two categories representing higher and lower motivation for treatment. Because missing responses on scale items ranged from 0 to 12 percent, we imputed missing values using regression-based methods

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<sup>1</sup>Motivation for treatment scale items available upon request.

(25). Specifically, we employed Stata 9.2 (26) to obtain estimates of missing values using other scale items as covariates.

**Independent Variables**—Respondents were asked their pregnancy status, race/ethnicity, age, educational attainment, and number of years of using drugs such as heroin, cocaine, crack, and marijuana. Type of drug user was established as non-injection drug user vs. injection drug user with a single item, “After the first time you shot drugs, how much time passed before you became a regular injector? By regular injector, I mean you stated injecting drugs frequently (at least once a week on average).” Those who had never injected drugs were coded zero, as were those who indicated that they never became regular injection drug users, while regular injectors were coded 1.

## DATA ANALYSIS

Propensity scores and factor analyses were conducted as data preparation methods before fitting logistic regression equations. Propensity scores, which are defined as a one-number summary of all of the covariates in a linear equation (27), were calculated for each sample member using the MatchIt package in R (28). The pregnant and non-pregnant participants were matched in a 1:2 ratio using propensity scores. To assess the adequacy of the matching procedure, balance scores, which estimate the similarity of the distributions of the covariates between the two groups, were calculated. Good balance between groups is indicated by a standardized mean difference between the treated and control groups’ covariate means of  $< .25$  (28). In addition, a principal components analysis was conducted in order to reduce the eleven treatment readiness items into one dependent variable, which we named the motivation for treatment scale

Subsequently, a logistic regression analysis was run in order to test the main effects of pregnancy status and race/ethnicity on motivation for treatment, while controlling for age, education, type of drug user, and years of drug use. A second logistic regression analysis was run in order to determine the effects of an interaction between race/ethnicity and pregnancy status on motivation for treatment. Finally, in order to interpret the significant interaction term, the motivation for treatment scale was regressed on race/ethnicity, age, education, years of drug use, and type of drug user, after splitting the sample by pregnancy status.

## RESULTS

We used propensity scores to match the pregnant and non-pregnant women, in addition to using principal components analysis to reduce the motivation for treatment scale into a single dichotomized outcome variable. We found satisfactory balance with the propensity score matching using ethnicity, age, and education. Also, the principal components analysis indicated that eleven items loaded on a single factor that had an Eigenvalue = 4.10, explained 37% of the cumulative variance, and had a Cronbach’s Alpha of .83.

The first logistic regression analysis, which tested the main effects of pregnancy status and race/ethnicity on the motivation for treatment scale, indicated that pregnant women were four times as likely (AOR = 4.17, 95% CI = 1.96, 8.90) as non-pregnant women to express a desire for treatment. Also, there was a significant main effect for years of drug use such that for each additional year of drug use, there was a 12% increase in the likelihood of membership in the higher motivation for treatment group. A second logistic regression tested the interaction of pregnancy status and race/ethnicity on the motivation for treatment scale. This regression model indicated that there was a significant interaction between pregnancy status and race/ethnicity (AOR = 6.34, 95% CI = 1.28, 31.33).

In order to interpret the interaction, another logistic regression was run after splitting the sample by pregnancy status (see Table 1). This analysis indicated that white pregnant women were nearly eight times as likely to express motivation for treatment as pregnant African-American women (AOR = 7.91, 95% CI = 1.02, 61.39). Among pregnant women, each additional year of drug use was associated with a 34% increase in the likelihood of membership in the higher motivation for treatment group.

## DISCUSSION

As hypothesized, pregnancy among drug dependent women was associated with a higher level of motivation to change drug-using behavior. Being pregnant may represent a period of time for drug dependent women when there is heightened motivation to change drug use and other risk behaviors.

After testing an interaction between pregnancy status and race/ethnicity, we found that white women were nearly eight times as likely to recognize their problem drug use and want to enroll in treatment, compared to African-American women. This finding supports previous research, which found that African Americans were significantly less likely to be in treatment compared to non-African Americans (15,16). This may be due to experiencing greater barriers to accessing treatment, such as problems with transportation, childcare, and cost, as well as the lack of cultural competence on the part of health care staff (17)..

Our study suggests that African-American pregnant drug-using women should be targeted for interventions to increase motivation for treatment. This group is already at risk for a variety of health problems related to poverty and minority status. Facing barriers to enrolling in drug treatment could further exacerbate the disparity in health status between African-American and white women. In contrast, enabling treatment enrollment among African-American drug-using women could increase their overall health as well as the health of their infants.

We also found that years of drug use was positively associated with motivation for treatment. One explanation for this finding is that people who have used drugs for a longer period of time may have experienced more adverse events associated with their drug use and subsequently, may be more motivated for treatment than people who have used drugs for a shorter period of time.

Several limitations were associated with this study. The data used in this analysis were baseline data from a larger study. These cross-sectional data prohibit definitive conclusions regarding the causal direction between pregnancy status and motivation for treatment. With samples that are analyzed in a subpopulation, the sample size can be relatively small. However, we used a 1:2 matching procedure between pregnant and non-pregnant drug-using women in order to boost the sample size, which also increased the power of the analysis. It was also possible that there were many unobserved variables that could have influenced the propensity scores. However, the two samples appeared to be well-matched based on the balance statistics, which suggested that we had sufficiently reduced the variance in the control group, which in turn enabled us to find significant associations in the logistic regression analyses.

In conclusion, our study suggests that African-American pregnant drug-using women need to be targeted for programs that increase their motivation for treatment. Future studies are needed in order to explore mechanisms that help to explain heightened motivation among pregnant drug-using women and to determine the extent to which motivation to change is sustained over time. Also, future research should explore reasons for racial/ethnic differences in motivation among pregnant drug-using women.

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**Table 1**  
Association between race/ethnicity and motivation for treatment stratified by pregnancy status (N = 149).

Variables	Not Pregnant (n=100)		Pregnant (n = 49)	
	AOR	[95% CI]	AOR	[95% CI]
Race/Ethnicity				
African American	1.00		1.00	
White	.69	[.26, 1.81]	7.91 *	[1.02, 61.39]
Age	.99	[.83, 1.17]	.89	[.72, 1.10]
Education				
Less than high school	1.00		1.00	
Finish high school	.96	[.40, 2.27]	1.81	[.39, 8.50]
Years of Drug Use	1.02	[.88, 1.88]	1.34 *	[1.06, 1.69]
Type of Drug User <sup>a</sup>				
Non-IDU	1.00		1.00	
IDU	.71	[.29, 1.78]	.73	[.14, 31.06]

\* p<.05.