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Gender and Racial/Ethnic Disparities in the Impact of HIV Prevention Programming in Substance Abuse Treatment

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Abstract: *Objective*: The objective of the study was to evaluate the capacity of HIV prevention programs offered in substance abuse treatment to reduce HIV-related risk behavior for women and men and for Black, Latino, and White groups. *Methods*: Prospective data was collected at intake, discharage, and 12 months post-treatment from 1992 to 1997 for the National Treatment Improvement Evaluation Study with a sample consisting of 3,142 clients from 59 service delivery units: 972 females, 1,870 males, 1,812 Blacks, 486 Latinos, and 844 Whites. *Results*: Study findings show that receipt of HIV prevention programming as part of substance abuse treatment services resulted in reductions in HIV-related risk behavior for the sample overall and for women as well as men. However, although Blacks received more prevention services than Latinos and Whites, the significant positive effect of HIV services on reduced HIVrisk behavior held only for Whites. *Conclusions*: Racial/ethnic disparities exist in the capacity for HIV prevention programming offered as part of substance abuse treatment to reduce HIV-risk behavior. The findings highlight the need for the development of culturally competent service delivery strategies to enhance the impact of these services for all groups.

Keywords: Gender, HIV prevention, race/ethnicity, substance abuse treatment

Substance abuse treatment can be effective in reducing HIV-related risk behavior and HIV infection (1–8). Studies indicate participants in drug treatment

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programs are less likely to engage in HIV-related risk behavior and less likely to test positive for HIV compared with those who do not participate in drug treatment programs. Indeed, although it is recognized that the most effective substance abuse treatment programs provide HIV counseling and offer HIV testing as part of a comprehensive service package, there is limited evidence of the availability and impact of these services, especially for gender and racial/ethnic groups.

Research examining the availability and impact of HIV prevention services indicates inconsistent availability for gender and racial/ethnic groups (9–11). D'Aunno, Vaughn, and McElroy (11) documented an increase in the use of HIV prevention practices in substance abuse treatment between 1988 and 1995. However, Grella, Ethridge, Joshi, and Anglin (9) found HIV prevention services were neither universally or uniformly available in a national multisite study of substance abuse treatment. They found programs are more likely to provide counseling and education to men than women and to those engaged in sex work. Findings from this study showed the availability of HIV prevention services varied by modality with prevention services available to 86% of clients in long-term residential, 60% of clients in short-term intervention, and less than half of clients in outpatient methadone and outpatient drug free modalities. Similarly, Bryan, Robbins, Ruiz, and O'Neill (10) found inconsistent availability of HIV prevention services in a prison-based study. Secondly, although evaluations of the impact of HIV prevention programs in community-based substance abuse treatment programs have shown the relation of these programs to reduced HIV risk behavior (12), assessments of HIV/AIDS prevention programs suggest that many are male-oriented and neglect issues of race, gender, culture and class (13–16). Only a limited number of studies have examined the impact of HIV/AIDS prevention programming on selected gender and race/ethnic groups (17–20). All these studies compared a standard AIDS prevention intervention with culturally targeted, enhanced interventions focusing on gender- and culturally-oriented social influences. Findings indicated culturally sensitive interventions were mixed in terms of whether they could enhance outcomes beyond a standard intervention. Further, only limited comparisons were made across gender and racial/ethnic groups. As a result, available research indicates HIV prevention programs may be effective for reducing HIV risk behaviors, but evidence of the differential impact on risk behaviors of specific gender and racial/ethni groups is limited.

It is the purpose of this study to examine the extent to which HIV prevention programs provided in the context of substance abuse treatment may reduce HIV-related risk behavior for women and men and members of Black, Latino, and White groups. We hypothesize that HIV prevention programs will reduce HIV-related risk behavior, but this effect will differ across gender and race/ethnic groups.

METHODS

Design and Sample

The analytic sample for this study was a subset of 4,526 clients who completed all intake, treatment discharge, and follow-up interviews in the National Treatment Improvement Evaluation Study (NTIES) (22). The NTIES data included data on organizational, service, and individual client characteristics, and as such, provided the opportunity to control for the impact of organizational, service, and client factors on client outcomes. After excluding clients from correctional facilities (N = 1,384), the final analytic sample consisted of a total of 3,142 clients from 59 service delivery units (SDU's), 1,123 females, 2,019 males, 1,812 Blacks, 486 Latinos, and 844 Whites (23).

Measures

Dependent Variable: Measures of HIV-Risk Behavior

The dependent variable was the change score in the HIV-risk behavior index (HRBI) between the pre-treatment and post-treatment measures (pre HRBI – post HRBI) to indicate the reduction of HIV-risk behavior after clients finished substance abuse treatment. The HRBI was constructed from 18 survey items related to drug use and sex risk behaviors administered at intake and approximately 12 months after completion of substance abuse treatment. The items included (1) drug use (last injection drug use; last time shared needles; how often needles were shared; how often works were shared), (2) number of heterosexual partners (number of vaginal, oral, and anal heterosexual partners), (3) number of homosexual partners (number of oral and anal homosexual partners), (4) unsafe heterosexual sex (condom usage for vaginal, oral, and anal heterosexual sex), (5) unsafe homosexual sex (condom use for oral and anal sex), (6) sex as commercial exchange (offered sex for money, drugs, clothes, or a place to sleep; gave money, drugs, clothes, or a place to sleep for sexual service), and (7) sex partners with known HIV risk (sex with injection drug users; sex with HIV-positive individuals). Following a scale construction strategy used in previous studies (23, 24), items were recoded and combined into an HRBI. Namely, each item was recoded so that higher scores were assigned to higher risk behavior. Then each item was "standardized" by dividing each response with the highest possible value such that its value could range from 0 to 1. A principal components analyhsis was conducted using all seven categories including drug use, number of heterosexual partners, number of homosexual partners, unsafe heterosexual sex, unsafe homosexual sex, sex as commercial exchange, and sex partners with known HIV risk. The first principal component accounted for at least 75% of the variance in the categories. Therefore, we

used the first component as a latent variable to represent the measure of HIV-risk behavior. The HRBI was a linear combination of these seven latent variables. Internal consistency reliability of the 7 latent variables was adequate as indicated by a Cronbach's alpha of about .70 for both the pre- or post-test measures.

Explanatory Variable: HIV/AIDS Prevention Services

The primary explanatory variable was *AIDS prevention service*. At discharge, respondents reported whether they had "received any counseling or attended any classes to learn about ways not to get or spread AIDS." This was analyzed as a binary variable. A number of other comprehensive services were served as the secondary independent variables. The service categories included *access services* (transportation and child care), *substance abuse counseling services* (drug/alcohol counseling, 12-step meetings, drug prescription for alcohol/drug problems), *family and life skills services* (parenting, domestic violence counseling, family services, assertiveness training, life skills, family planning, nonmedical pregnancy services), *health services* (health services, medical pregnancy services), *mental health services* (mental health counseling or treatment), and *concrete services* (school, job skills, housing, help collecting benefits, English training, help getting alimony/child support). At discharge, clients reported whether they had received any of these services. In each category, the number services used by each individual was calculated as a measure of receipt of that service category. Since each service category was constructed from a different number of services, the measurement of each category was normalized by its mean and standard deviation to allow for comparison of fitted coefficients in the multivariate modeling.

Control Variables: Organizational- and Client-Level Characteristics

Control variables included organizational- and client-level characteristics. Organizational-level control variables, derived from administrative interviews, included accreditation, modality, ownership, onsite services, and frequency of counseling. Client-level control variables included age (in years from date-of-birth), race (non-Latino Black, Latino, Non-Latino Non-Black where Non-Latino Non-Black was the reference category), education (in years), employment (the longest period they had worked full-time), health status (whether health limits the work they can do), mental health status (measured in terms of 24 hour psychiatric visits in the last year), ever beaten by spouse or partner, payment source (private, public, or uninsured), pre-treatment drug use (summing the number of days in the last 30 days that each respondent used the five most frequently used substances: alcohol, marijuana, cocaine, cocaine powder, and heroin), previous alcohol or drug treatment experience, and service duration.

Statistical Analysis

A multiple imputation procedure (25) was conducted to fill in the missing values using Markov Chain Monte Carlo (MCMC) method (26, 27). Imputation was conducted for the organizational variables and client-level variables independently. The resulting five imputed datasets for organizational- and client-level data were merged for further statistical analysis, using mixed linear models to account for potential within-treatment organization correlation of HIV-risk behavior. The independent variables included AIDS prevention services and specific service categories (access, substance abuse counseling, family/life skills, health, mental health, concrete services), while controlling organizational characteristics (modality, JCAHO accreditation/license, ownership, onsite service availability, frequency of counseling) as well as client characteristics (gender, race/ethnicity, age, education, whether health limits work, whether ever beaten by spouse, mental health visit, prior drug use, prior alcohol/drug treatment and payment source). The model also included interactions among gender, race/ethnicity, and specific service characteristics.

The modeling outputs from the five-datasets were combined to evaluate the effects of service comprehensiveness and control variables on post-treatment HIV-risk behavior. All the analyses were conducted in SAS 9.1.3.

RESULTS

Gender and Racial/Ethnic Comparisons of HIV-Risk Behavior and Service Receipt

Evidence is accumulating that substance abuse treatment can contribute to reducing HIV-related risk behaviors. Findings from this study add to this evidence. The positive value for change in Table 1 (line 1) shows that for the NTIES sample HIV-risk behavior is reduced following substance abuse treatment. Further, it shows that HIV risk behavior is reduced for all groups studied. It is reduced significantly more for women than for men and for Blacks more than Latinos and Whites.

Table 1 (line 2) also shows women receive significantly more prevention services than men, and Blacks receive significantly more prevention services than Latinos and Whites. Further, women received significantly more services than men in all categories except mental health service. The race/ethic comparison showed that, on average, compared with Blacks and Latinos, Whites received more services in the categories of family/life skill counseling, mental health service, concrete service. In addition to receiving more HIV prevention services, Blacks received more services than other race/ethnicity groups in substance abuse counseling and health services. Latinos received the most access (transportation and child care) services.

Table 1. Gender and racial/ethnic comparison of HIV-risk behavior and receipt of services

Services/HIV Risk Behavior	Total (N=3142)		Women (N=1123)		(Men) (N=2019)			Black (N=1812)		Latino (N=J86)		White) (N=844)		
	Mean	Std	Mean	Std	Mean	Std	P[1]	Mean	Std	Mean	Std	Mean	Std	P[2]
Change in HIV risk behavior (pre-post)	7.08	12.50	8.29	13.93	6.40	11.57	**<0.01**	7.51	12.98	5.66	11.90	6.96	11.71	**0.01**
AIDS Pevention Service	0.69	0.46	0.75	0.43	0.66	0.47	**<0.01**	0.74	0.44	0.62	0.49	0.64	0.48	**<0.01**
Service Access	0.45	0.53	0.55	0.58	0.40	0.49	**<0.01**	0.45	0.54	0.54	0.54	0.41	0.51	**<0.01**
Substance Abuse Counseling	1.35	0.77	1.48	0.74	1.27	0.78	**<0.01**	1.42	0.73	1.21	0.83	1.26	0.80	**<0.01**
Family/Life Skill Counseling	1.71	1.52	2.01	1.69	1.55	1.40	**<0.01**	1.64	1.50	1.72	1.53	1.88	1.56	**<0.01**
Health Service	1.31	0.69	1.35	0.69	1.29	0.69	**0.01**	1.35	0.69	1.23	0.69	1.28	0.69	**<0.01**
Mental Health Service	0.25	0.43	0.27	0.44	0.24	0.43	0.06	0.19	0.39	0.29	0.45	0.36	0.48	**<0.01**
Concrete Service	0.72	0.99	0.86	1.08	0.64	0.92	**<0.01**	0.66	0.95	0.71	0.91	0.84	1.10	**<0.01**

Note: [1]Gender comparison by test.
[2]Race comparison by ANOVA.

Relation of HIV Prevention Services to HIV-Risk Behavior for Gender and Race/Ethnic Groups

The mixed linear model that controlled for both client and organizational characteristics was used to examine the relation of receipt of a specific service—AIDS prevention—to the change in HIV-risk behavior. The model included the interaction terms among gender, race/ethnicity, and service variables. Table 2 shows the results from the multivariate analysis for service variables and interaction terms (the coefficients of the control variables are not shown).

Table 2. The output of mixed linear model

Controlling variables and independent variables	Coef	S.E.	P-value
Gender	0.12	0.81	0.88
Black	−0.39	0.92	0.67
Latino	−0.72	1.20	0.55
AIDS Pevention Service	1.87	0.87	**0.04**l
Service Access	1.17	0.83	0.17
Substance Abuse Counseling	−0.09	0.85	0.92
Family/Life Skill Counseling	−0.13	0.91	0.89
Health Service	1.16	0.87	0.20
Mental Health Service	1.23	0.72	0.10
Concrete Service	0.23	0.84	0.78
Gender × AIDS Prevention Service	−1.13	1.01	0.27
Gender Service Access	−1.88	0.99	0.07
Gender × Substance Abusing Counseling	0.66	0.99	0.51
Gender × Family/Life Counseling	−0.49	1.13	0.67
Gender × Health Service	−0.85	1.07	0.44
Gender × Mental Health Service	−1.41	0.86	0.11
Gender × Concrete Service	−0.74	1.06	0.49
Black × AIDS Prevention Service	−2.04	1.04	**0.06**
Black × Service Access	−1.14	0.93	0.23
Black × Substance Abusing Counseling	1.68	1.00	0.11
Black × Family/Life Counseling	−0.48	1.08	0.66
Black × Health Service	−1.44	1.06	0.19
Black × Mental Health Service	−0.38	0.88	0.67
Black × Concrete Service	0.64	1.00	0.52
Hispanics × AIDS Prevention Service	−2.05	1.34	0.14
Latino × Service Access	0.27	1.30	0.84
Latino × Substance Abusing Counseling	1.14	1.39	0.42
Latino × Family/Life Counseling	−0.65	1.65	0.70
Latino × Health Service	−0.03	1.61	0.99
Latino × Mental Health Service	−1.00	1.28	0.44
Latino × Concrete Service	1.22	1.43	0.40

AIDS prevention service was the only service category that significantly predicted a reduction in HIV-risk behavior. All other service categories were not significantly related to HIV-risk behavior.

The influence of gender and race/ethnicity on the impact of substance abuse treatment on HIV-risk behavior can be assessed by examining both the main effects for gender and race/ethnicity and the two-way interactions of gender and race/ethnicity various service characteristics.

Although interaction terms are an appropriate means for assessing the impact of moderator variables such as gender and race/ethnicity, interaction terms can be difficult to detect in field studies (28, 29). In this analysis, there were no main effects for gender or race/ethnicity and no interaction effects for gender. However, there was a nearly significant interaction for race/ethnicity x HIV prevention service ($p < .06$) suggesting the effect of AIDS prevention service differed among various race/ethnic groups. The estimated coefficient (slope) was positive for Whites but was negative for Blacks and Latinos, suggesting only Whites benefited from AIDS prevention service. The benefits were somewhat greater for Latino and White women than Latino and White men. There was no difference for Black women and men in the impact of AIDS prevention service on HIV-risk behavior. Overall, the significant main effect of AIDS prevention service primarily is the result of its impact on White clients.

DISCUSSION

Although evidence indicates that substance abuse treatment can be effective overall in reducing HIV-related risk behavior, it has been unclear what components of service are most important in reducing risk behavior. HIV prevention programs have been designed to increase knowledge of HIV and reduce risk-related behaviors, but these programs have not been uniformly available and their impact has not been well documented. Findings from this large-scale treatment evaluation study, however, show a clear relation between receipt of HIV prevention services and reductions in HIV-risk behavior from the multivariate analysis. In this study, targeted HIV prevention services had a significant impact in reducing HIV-risk behaviors when provided as part of substance abuse treatment. Additionally, this study examined the impact of HIV prevention services for women and men and for Blacks, Latinos, and Whites. Given that the growth in AIDS cases has occurred disproportionately among women, Blacks, and Latinos (13), it is especially important to understand the impact of HIV prevention services for these groups. Study findings also indicate that different groups receive different amounts of HIV prevention programming and the effects are not consistent. Women and Blacks are more likely to receive prevention programming, but the significant positive effect of HIV services on reduced HIV-risk behavior primarily accrues to Whites, especially White women. For

Whites, but not Blacks or Latinos, receipt of HIV prevention services is related to reductions in risk behavior.

Gender and racial/ethnic differences identified in this study reinforce concerns that prevention efforts may not be delivered in a culturally competent manner that allow all groups to benefit. In a recent analysis of the use of culturally competent treatment practices in substance abuse treatment overall, Campbell and Alexander (30) found that that specific culturally competent treatment practices (such as African-American staff composition, bilingual staff, and single-race therapy groups) were related to clients' use of ancillary health and social services in substance abuse treatment. For example, they found that physical exams and financial services appeared to be more responsive to culturally competent practices than did mental health and transportation. Other studies evaluating the impact culturally-targeted HIV prevention services compared to standard services indicate culturally competent services may enable clients to remain in treatment longer, but may have little demonstrable impact on risk behavior (17–20). Although these results derive from small, community-based studies, they represent efforts to understand how to design gender- and racial/ethnic responsive services. Findings reinforce the need to understand how specific practices may increase the impact of HIV prevention services for specific gender and race/ethnic groups.

Findings from the study must be considered in light of limitations of the data set. A major limitation of this study derives from the categorization of race/ethnic groups. Although survey respondents self-identified their group status, few additional subgroup characteristics were measured. As a result, it is not possible to refine or redevelop the categories. The conclusions that can be drawn about the race/ethnic subgroups and their responsiveness to specific services must be tempered by consideration the definition of categories used in this study and the likely heterogeneity within them. Second, the NTIES data was collected between 1992–1997. During these 10–15 years, the treatments delivered for substance abuse may have undergone considerable changes. However, an analysis of trends in the availability of comprehensive services, including HIV preventive services, indicates little change in availability of these services (31). Thus, it is likely the availability of AIDs prevention services has not changed dramatically, and evidence of its differential impact for different race/ethnicity groups found in the study can still provide support for the delivery of AIDS prevention service in the substance treatment to reduce HIV-risk behaviors.

In summary, study findings indicate substance abuse treatment can contribute to reductions in HIV-risk behavior particularly when it includes HIV prevention services. HIV prevention services can have a targeted impact on reducing risk behaviors. Further, the differential response of racial/ethnic groups to these services—specifically, the finding that Whites, not Blacks or Latinos, reduce their risk behaviors in response to prevention services—highlights the

need for research on culturally competent services, i.e., the delivery of HIV prevention services that could be effective for all groups.

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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