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Substance-related Problems and Treatment among MSM and Other Men in Chicago

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Abstract

This study compares a sample of urban MSM with a general population sample of men in the same city on self-reported problems with substance use indicative of dependence, and history of substance use treatment. Both samples were randomly selected using multistage probability methods. All participants completed Audio Computer-Assisted Self-Interviews (ACASI), including questions on substance use, problems related to substance use experienced in the past 12 months, and substance treatment. Problem use of alcohol, marijuana, and cocaine did not differ between samples. Compared to men in the general population sample, MSM were significantly more likely to experience problems related to the use of sedatives, tranquilizers, or prescription pain relievers. Among MSM, history of substance treatment was associated with a positive HIV test, and treatment usually preceded HIV diagnosis. Research is needed on effective methods for integrating HIV prevention for MSM into substance treatment settings, including physician-administered buprenorphine treatment for opiate addiction.

Keywords

MSM; drug dependence; alcohol dependence; substance treatment; HIV

1. Introduction

The recently documented 11% increase in HIV/AIDS infection among men who have sex with men (MSM) underscores the continuing need for effective prevention strategies targeted to this population (Centers for Disease Control and Prevention, 2007). A substantial body of research now also documents elevated rates of alcohol and illicit drug use among MSM, and its relationship to unsafe sex and the spread of HIV (Celentano et al., 2006; Colfax et al., 2004; Irwin et al., 2006; Seage et al., 1998; Stall & Purcell, 2000; Trocki & Leigh, 1991; Venable et

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al., 2004). As Shoptaw and Frosch (2000) have noted, the viability of substance abuse treatment as a vehicle for HIV prevention among MSM is contingent upon the extent to which members of this population need and seek treatment for substance abuse problems.

A review of recent literature suggests a lack of up-to-date information about problem substance use among MSM. While several early studies employing convenience samples of gay men reported elevated rates of alcohol use problems (Knowlton, McCusker, & Stoddard, 1994; Lohrenz et al., 1978; McKirnan & Peterson, 1989) [see Bux (1996) for a review], analyses of broader community samples and population-based survey data have failed to corroborate these findings (Cochran et al., 2000; Drabble, Midanik, & Trocki, 2005; Martin, 1990; Stall & Wiley, 1988). Several studies have reported higher rates of illicit drug use among MSM than among heterosexual men or men in general (Cochran et al., 2004; Hughes & Eliason, 2002; McKirnan & Peterson, 1989; Skinner, 1994; Skinner & Otis, 1996; Stall & Wiley, 1988; Woody et al., 2001). Few studies, however, have specifically addressed the issues of substance *abuse*, problem substance use, or substance dependence, among MSM. We found two studies (Stall et al., 2001; Woody et al., 2001) that reported high rates of *frequent* illicit substance use among MSM, however they did not include comparison groups of heterosexual men. In the 1984 San Francisco Men's Health Study, Stall and Wiley (1988) found that while young (24–34) homosexual men were more likely to report weekly use of poppers, barbiturates, and amphetamines compared to young heterosexual men, no differences were found on weekly use of marijuana, cocaine, psychedelics, or opiates. Overall, levels of use that could be considered characteristic of substance abuse occurred at low rates in MSM (Stall & Purcell, 2000; Stall & Wiley, 1988).

Some evidence of more problematic substance use among MSM comes from a recent study that addressed symptoms of substance dependence. Cochran and colleagues (Cochran et al., 2004) reported that sexually active homosexual men in the 1996 National Household Survey on Drug Abuse (NHSDA) were more likely to report at least one symptom indicative of dysfunctional drug use within the previous year, and to meet criteria for marijuana dependence syndrome, compared to sexually active heterosexual men.

Even less information is available on the relative likelihood of MSM to seek treatment for problems with alcohol or drug use. Cochran and colleagues found no difference between homosexually active men and exclusively heterosexually active men in past year treatment for alcohol or drug-related problems in the 1996 NHSDA (Cochran et al., 2000; Cochran, Sullivan, & Mays, 2003).

In sum, while considerable research documents relatively high levels of use of alcohol and certain illicit substances, research has failed to document the extent of *problem* substance use among MSM. Research has also failed to document the extent to which problem substance use patterns among MSM diverge from males in the general population. Given the potential role of drug treatment programs as a vehicle for HIV/AIDS prevention, we also note a lack of research directly investigating the prevalence of drug treatment involvement among MSM in general and the sequencing of drug treatment involvement among MSM reporting HIV positive status in particular. The current paper uses data from probability samples of the general population and MSM in Chicago to attempt to address these critical issues.

2. Methods

2.1. Samples & procedures

This study employed two household probability samples of men in Chicago. The first was a multi-stage area probability sample of more than 600 Chicago residents, ages 18–40, conducted from June 2001 to January 2002, and described in detail elsewhere (Fendrich et al., 2004).

Interviews were completed with 242 men; 92% of these men self-identified as being only heterosexual. The second sample was obtained as a supplement to the general population survey, and was concentrated in two postal zip codes in a part of the city known to have a high concentration of gay men. As in the parent study, subjects were randomly sampled using multistage probability methods. Interviews were conducted between September 2002 and January 2003. Men who reported a history of consensual sex with other men or who identified themselves as gay or bisexual in a face-to-face screening were eligible to be selected. The age range for this sample was 18 to 55 years old. Low eligibility rates from initial pilot testing and discussion with field staff suggested the need for expanding the age range beyond that considered in the previous study. Interviews were completed with 216 self-identified men who have sex with men (MSM).

Substance abuse questions were administered by audio-computer-assisted self-interview (ACASI). The questionnaire for the MSM sample included an additional module concerned with sexual risk behavior. Following the survey, subjects in the general household sample were invited to participate in three different drug tests (hair, saliva, and urine), while subjects in the MSM sample were invited to participate in saliva and urine testing. Immediately following the drug testing, a set of debriefing probes was administered to gauge survey and drug test reaction. Biological specimens were tested for amphetamine, cocaine, heroin, and marijuana, and those screened positive were confirmed by GC/MS procedures. Saliva tests were screened for cotinine (the metabolite of tobacco). Finally, supplemental tests were conducted on urine samples to detect (and confirm) the presence of two club drugs, Rohypnol and Ketamine. With respect to drug testing, 83% ($n = 209$) of men in the general household sample and 80% ($n = 172$) of men in the MSM sample provided a usable urine or oral fluid specimen.

The samples differed markedly in their distributions of age, race/ethnicity, income, and education level (see Mackesy-Amiti, Fendrich and Johnson, 2008). Reflecting differences in the composition of these populations, the MSM sample included a greater proportion of men who were white, over 40 years old, college-educated, and earning more than \$70,000. Despite these differences, this study provides a rare opportunity to compare a sample of self-identified MSM with a general population sample of men obtained in a similar place and time, and with nearly identical methodology.

2.2. Measures & Analysis

2.2.1. Substance Use Problems and Dependence—The ACASI questionnaire included seven items concerned with symptoms of substance dependence in the past 12 months, for each of five substance classes: alcohol, marijuana, cocaine, heroin, and pills (tranquilizers, sedatives, and pain relievers). However, there was no past year heroin use reported in the general population sample of men, and very little in the MSM sample. The items reflected DSM-IV (American Psychiatric Association, 1994) criteria of drug dependence, and included 1) spending a great deal of time in substance-related activities, 2) using much more often or in larger amounts than intended, 3) needing a larger amount to get the same effect (i.e. developing a tolerance), 4) experiencing impairment in meeting social obligations or engaging in recreational activities due to substance use, 5) experiencing emotional or psychological problems due to substance use, 6) experiencing physical health problems caused or exacerbated by substance use, and 7) wanting to cut down on use but being unable to. Items 5 and 6 were combined into a single item, resulting in a total of six items. DSM-IV criteria also include withdrawal symptoms, which were not assessed.

Respondents answered “yes” or “no” to these questions. Only respondents who used the particular substance or class of substances in question within the previous 12 months received these items. The present analyses are restricted to these respondents; that is, we compare the occurrence of substance-related problems *among men who reported use of those substances in*

the past year. This approach eliminates a potential bias in substance use reporting, wherein self-identified MSM may be more willing to report recent use than are men in the general household population. Within each substance category, the number of items answered “yes” was computed. Answering “yes” to three or more items was considered to be indicative of substance dependence syndrome (cf. Cochran et al., 2004).

Using Stata’s svymean procedure (StataCorp, 2003), we compared the two samples on the mean number of items endorsed within each substance category, and the proportion endorsing three or more problems, adjusting for survey design effects. Wald tests were computed to test the significance of differences between the samples.

Unweighted logistic regression analyses were conducted on the “any symptoms” indicator, and the dependence syndrome indicator (three or more symptoms endorsed). Models included age, race (Nonwhite vs. White), educational level (high school graduate or less, some college, college graduate), and relationship status (married or cohabiting vs. single) as covariates. Analysis of substance dependence for the “pills” category was not possible, as no men in the general population sample reported three or more symptoms. Only one man in this sample endorsed any problems with the use of tranquilizers, sedatives, or pain relievers, and he endorsed only one.

The distributions of the number of items endorsed within each substance category conformed most closely to a negative binomial model (Long, 1997). Negative binomial regression models were constructed to compare the samples on the number of items endorsed within each substance category. Again, age, race, educational level, and relationship status were included as covariates.

2.2.2. Substance Treatment—Respondents were asked about their history of drug and alcohol treatment, including age of first treatment, currently receiving treatment, and months since last treatment. Logistic regression analyses were conducted to compare the samples on lifetime treatment (alcohol, drugs, and either alcohol or drugs), and current treatment, controlling for age, race, educational level, and relationship status. OLS regression analyses were conducted on age of first treatment, and months since last treatment, controlling for demographic variables.

2.2.3. HIV Status—Men in the MSM Supplement sample were asked about their history of HIV testing, including age when first tested, time since last tested, and results of the last test. We tested the association between HIV status and substance use treatment history in a logistic regression analysis, controlling for age, race, educational level, and relationship status. Among those who tested positive for HIV and received drug or alcohol treatment, we examined the sequence of HIV diagnosis and first treatment.

3. Results

3.1. Mean Comparisons

Weighted mean numbers of symptoms endorsed, and weighted proportions of subjects exhibiting substance dependence syndrome (endorsing three or more symptoms) were computed, along with design effect adjusted confidence intervals. No significant differences were found for problems with alcohol or cocaine.

Men in the general population sample endorsed a greater number of problems with marijuana ($M = 1.49$, 95% CI 1.08 – 1.90) compared to men in the MSM sample ($M = 0.79$, 95% CI 0.54 – 1.04), and were more likely to exhibit marijuana dependence syndrome (28%, 95% CI 0.17 – 0.40 vs. 13%, 95% CI 0.07 – 0.19). In the “pills” category, men in the MSM sample endorsed

a greater number of problems on average ($M = 0.61$, 95% CI 0.11 – 1.11) than men in the general population sample ($M = .03$, 95% CI $-0.03 - 0.08$), and were more likely to exhibit substance dependence syndrome for “pills” (12%, 95% CI 0.00 – 0.23 vs. 0%).

3.2. Logistic Regression Analyses

Adjusted odds ratios and design effect adjusted confidence intervals of any symptom endorsed are shown in Table 1. When adjusted for demographic variables, men in the MSM sample were significantly more likely to report at least one problem related to the use of tranquilizers, sedatives, or prescription pain relievers ($OR = 31.59$, 95% CI 1.07 – 934.91). Relationship status was omitted from the model as none of the nine men who were married/cohabiting reported any problems related to pill use. Only one man in the general population sample reported a problem in this substance category, resulting in a very wide confidence interval for this estimate.

Age was significantly related to alcohol problems, with older men less likely to report these problems ($OR = 0.96$, 95% CI 0.93 – 0.98). On the other hand, older men were more likely to report problems with the use of prescription drugs ($OR = 1.16$, 95% CI 1.03 – 1.31). Age was not related to problems with marijuana or cocaine use. Relationship status was significantly related to alcohol problems, with married/cohabiting men less likely to report problems ($OR = 0.60$, 95% CI 0.41 – 0.86). Non-white race/ethnicity was associated with a significantly increased risk of problems with marijuana ($OR = 2.51$, 95% CI 1.08 – 5.80) and cocaine ($OR = 5.29$, 95% CI 1.04 – 26.98). Level of education was not related to reports of problems with substance use.

Adjusted odds ratios and design effect adjusted confidence intervals of substance dependence syndrome are shown in Table 2. When adjusted for demographic covariates, there were no differences between the samples in any of the substance categories. Non-whites were only marginally more likely to report three or more problems related to marijuana use ($OR = 2.49$, 95% CI 0.96 – 6.46), and cocaine use ($OR = 7.73$, 95% CI 0.94 – 63.24).

3.3. Negative Binomial Regression Analyses

Adjusted incidence rate ratios and design-effect adjusted confidence intervals from the negative binomial regressions on number of problems endorsed are shown in Table 3. MSM endorsed significantly more problems with the use of tranquilizers, sedatives, or pain relievers, compared to men in the general population sample ($IRR = 39.62$, 95% CI 5.81 – 270.29); the expected number of problems for MSM was .07 compared to .002 for men in the general population sample. Married/cohabiting men were highly unlikely to report problems related to pills ($IRR = 7.25e^{-.08}$, 95% CI $2.29e^{-.08} - 2.30e^{-.07}$), in fact the expected number of problems was zero for married/cohabiting men, compared to 0.21 for single men. (For single MSM, the expected number of problems was 0.90, compared to 0.023 for single men in the general population sample.) Age was significantly negatively related to number of alcohol problems ($IRR = 0.97$, 95% CI 0.95 – 0.995), as was a married/cohabiting relationship status ($IRR = 0.66$, 95% CI 0.95 – 0.998). Non-whites reported significantly more problems related to marijuana use ($IRR = 1.99$, 95% CI 1.21 – 3.29), and slightly more problems related to cocaine use ($IRR = 4.12$, 95% CI 0.91 – 18.54). Low educational level (high school or less) was marginally associated with more alcohol problems ($IRR = 1.66$, 95% CI 0.99 – 2.79).

3.4. Treatment

Using weighted estimates, 11% (95% CI 6% – 15%) of the men in the main sample, and 16% (95% CI 10% – 23%) of men in MSM supplement sample reported ever receiving alcohol and/or drug treatment. Current treatment was reported by 2% (95% CI 0% – 3%) of men in the main sample and 5% (95% CI 1% – 8%) of men in the MSM sample. After adjusting for age,

race, education level, and relationship status, no differences between the samples were statistically significant. There was a marginal difference ($p = .09$) for currently receiving treatment, with MSM nearly three times as likely to be currently receiving treatment for alcohol or drug use (AOR = 2.89, 95% CI 0.85 – 9.81). Need for treatment, defined as showing signs of current drug or alcohol dependence and having no history of drug or alcohol treatment, did not differ between the samples.

3.5. HIV Status and Substance Treatment among MSM

Fifteen percent ($N = 29$) of the MSM sample tested positive for HIV. Compared to men who tested negative or were not tested, those who tested positive were over 3 times as likely to have received drug or alcohol treatment (Table 4). In seven out of nine cases, the age of first drug or alcohol treatment preceded HIV diagnosis by at least two years.

4. Discussion

No differences were evident for problems related to the use of alcohol, marijuana, or cocaine. The lack of differences across populations on these behaviors was unexpected, especially in light of previous research mainly focused on convenience samples of MSM. Indeed, recently completed analyses of data from our own study have suggested relatively higher rates of substance use, particularly in men over the age of 30, compared with those in the general population (Mackesy-Amiti, et al., 2008). Accordingly, we underscore the point that our findings relate to *problem substance use*, or use that is potentially symptomatic of substance dependence.

There was one major exception to this pattern of findings. Consistent with expectations generated from prior literature, problematic use of pills was higher in MSM (and especially in older MSM) than it was in the general population. Twenty-six percent (9/35) of MSM who used tranquilizers, sedatives, or prescription pain relievers reported at least one problem, and 12% (4/35) reported three or more problems, suggestive of dependence. In contrast, of the 23 men in the general population sample who reported use of tranquilizers, sedatives, or prescription pain relievers, one man reported one problem. Most of the MSM who reported problems with this class of substances were over 40 years old, leading us to re-examine the analyses for men 40 and under only. The differences between the samples remained significant both in the logistic regression analysis of any problem endorsed (OR = 23.29, 95% CI 1.34 – 404.00) and in the negative binomial regression analysis of number of problems endorsed (IRR = 15.94, 95% CI 1.66 – 153.28).

History of drug or alcohol treatment did not differ between the samples, and MSM were only slightly more likely to report current treatment. For MSM, history of drug or alcohol treatment was not related to any of the socio-demographic variables, however it was significantly associated with a positive HIV test. First drug or alcohol treatment usually preceded HIV diagnosis. The relationship between HIV status and substance treatment may be due to a proclivity towards more risky sexual behavior among men who develop severe substance use problems, and suggests that for many MSM, treatment reflects a missed opportunity for HIV risk prevention education.

A number of limitations should be stressed with respect to these data and their implications for prevention strategies. First, we note that substance use trends in Chicago may have changed in response to local interventions in the years since these data were collected (2001–2003). There are also concerns about generalizations to other locales. Our data relate to information that was collected in a single large urban setting, with a residentially concentrated MSM population. The patterns of drug use and their relevance for prevention strategies may not be generalizable to non-urban areas, or to other urban locations within or outside of Chicago where

MSM are not concentrated. In addition, the data reported here were entirely based on self-report. We have demonstrated elsewhere (Fendrich et al., 2004; Mackesy-Amiti et al., 2008) that drug use is underreported and such behavior influences cross-sample comparisons with respect to prevalence. The extent to which problems resulting from drug use may have been underreported here is unknown.

In recent years, growing problems with illicit use of prescription medication for pain have been well documented (e.g. Gilson et al., 2004). Concurrently, there has been the emergence of physician office-based buprenorphine treatment for addiction to opiates (including opiate painkillers) (Stein, Cioe, & Friedmann, 2005). The relatively high rate of pill problems noted in our sample may translate into more opiate-related treatment visits to primary care providers by MSM in Chicago. To the extent that pill addiction may contribute to high risk sexual behavior, and consequently STDs and HIV/AIDS, buprenorphine providers may need to think about integrating prevention messages within the context of their medication administration sessions.

The investigation of the link between pill-related problems and risk behavior among MSM remains a high priority for future research. Given the general linkages between addiction and risky behavior that have been well established in prior literature along with our findings that addiction treatment usually precedes HIV/AIDS among MSM, prevention researchers need to explore effective methods for integrating prevention messages and programs into the growing range of substance abuse treatment settings serving substance involved MSM.

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Table 1
Logistic regression analysis: Any substance use problem endorsed (men reporting past year substance use)

Substance		OR	95% CI	p
Alcohol (N = 399)	Sample:	1.40	0.75	2.64
	Age	0.96	0.93	0.98
	Relationship:	0.60	0.41	0.86
	Race/Ethnicity:	1.00	0.58	1.73
	Education:	1.14	0.44	1.34
Marijuana (N = 175)	Sample:	0.77	0.41	0.86
	Age	0.66	0.27	1.64
	Relationship:	0.97	0.91	1.03
	Race/Ethnicity:	0.43	0.15	1.23
	Education:	2.51	1.08	5.80
Cocaine (N = 63)	Sample:	1.72	0.65	4.59
	Age	0.43	0.15	1.23
	Relationship:	2.08	0.42	10.38
	Race/Ethnicity:	1.02	0.93	1.11
	Education:	0.49	0.08	3.06
Pills ^a (N = 58)	Sample:	5.29	1.04	26.98
	Age	2.46	0.37	16.21
	Relationship:	0.85	0.22	3.33
	Race/Ethnicity:	31.59	1.07	934.91
	Education:	1.16	1.03	1.31
	Sample:	^b		
	Age	8.22	0.61	110.28
	Relationship:	7.33	0.34	156.71
	Race/Ethnicity:	0.93	0.15	5.61
	Education:			

^a tranquilizers, sedatives, or prescription pain relievers

^b This variable was omitted from the model because none of the 9 men who were married/cohabiting reported any problems with pills

Table 2
Logistic regression analysis: Substance dependence syndrome^a (men reporting past year substance use)

Substance		Adj OR	95% CI	p
Alcohol (N = 399)	Sample:	MSM vs. Gen Pop.	1.36	0.69
	Age		0.98	0.94
	Relationship:	Married/Cohabiting	0.58	0.30
	Race/Ethnicity:	Non-white vs. White	0.63	0.31
	Education:	High school or less	1.96	0.82
Marijuana (N = 176)	Sample:	Some college (vs. College graduate)	1.19	0.58
		MSM vs. Gen Pop.	0.70	0.26
	Age		0.95	0.89
	Relationship:	Married/Cohabiting	0.45	0.13
	Race/Ethnicity:	Non-white vs. White	2.49	0.96
Cocaine (N = 63)	Education:	High school or less	0.53	0.17
		Some college (vs. College graduate)	0.45	0.13
	Sample:	MSM vs. Gen Pop.	4.04	0.54
	Age		1.02	0.93
	Relationship:	Married/Cohabiting	0.52	0.06
	Race/Ethnicity:	Non-white vs. White	7.73	0.94
	Education:	High school or less	3.78	0.38
		Some college (vs. College graduate)	1.41	0.20
				0.056
				0.056

^aEndorsement of three or more symptoms

Table 3

Negative binomial regression: Number of substance use problems endorsed (men reporting past year substance use)

Substance		IRR	95% CI	p
Alcohol (N = 399)	Sample:	1.35	0.92	2.00
	Age	0.98	0.95	1.00
	Relationship:	0.66	0.47	0.036
	Race/Ethnicity:	0.87	0.59	0.019
	Education:	1.66	0.99	0.055
Marijuana (N = 176)	Sample:	1.10	0.72	1.69
	Age	0.95	0.53	1.72
	Relationship:	0.97	0.93	1.01
	Race/Ethnicity:	0.61	0.27	1.39
	Education:	1.99	1.21	3.29
Cocaine (N = 63)	Sample:	0.82	0.46	1.45
	Age	0.81	0.40	1.68
	Relationship:	1.71	0.63	4.61
	Race/Ethnicity:	1.01	0.93	1.10
	Education:	0.70	0.13	3.74
Pills ^a (N = 58)	Sample:	4.12	0.91	18.54
	Age	1.07	0.20	5.58
	Relationship:	0.82	0.19	3.44
	Race/Ethnicity:	39.62	5.81	270.29
	Education:	1.07	0.98	1.18
	Sample:	7.25e ⁻⁰⁸	2.29e ⁻⁰⁸	2.30e ⁻⁰⁷
	Age	2.84	0.37	21.74
	Relationship:	4.45	0.59	33.58
	Race/Ethnicity:	0.97	0.46	2.04
	Education:			

^a tranquilizers, sedatives, or prescription pain relievers

Table 4

Substance Treatment Among MSM (N=216)

		Alc Tx	Drug Tx
Age	18–30	6%	6%
	31 +	15%	13%
Education	< College Grad	18%	14%
	College Graduate	11%	10%
Race	White	14%	12%
	Non-white	11%	9%
Relationship	Cohabiting	16%	12%
	Single	12%	11%
HIV Result	Neg/Unknown	11%	9%
	Positive	28%	24%
		*	*
HIV Positive	OR	3.18	3.18
	95% CI	(1.07 – 8.71)	(0.99 – 9.19)
HIV Positive	Adj OR ^a	3.03	3.27
	95% CI	(1.32 – 6.97)	(1.05 – 10.12)

^a Adjusted for age, race, college education, and relationship status