

*The American Journal of Drug and Alcohol Abuse*, 31:371–391, 2005  
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ISSN: 0095-2990 print / 1097-9891 online  
DOI: 10.1081/ADA-200056772

## **Interpersonal Discrimination and the Health of Illicit Drug Users**

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**Abstract:** Although discrimination has been shown to adversely affect the health of marginalized populations, there is a paucity of research on the health impacts of discrimination experienced by illicit drug users. The purpose of this study was to examine the association between interpersonal discrimination and the mental and physical health of illicit drug users taking into account several potential confounding factors. A sample of 1,008 active illicit substance users (defined as having used cocaine, crack, or heroin in the previous 2 months) were recruited in three New York City neighborhoods between August 2000 and January 2001 using street-outreach techniques. Discrimination due to illicit drug use was the most common form of interpersonal discrimination experienced and more than one-half the study participants reported experiencing discrimination due to more than one attribute. Discrimination was significantly associated with poor mental health (measured by the SF-36 mental health score), depression (measured by the CES-D), and the number of self-reported chronic physical health conditions. The presence of multiple stigmatizing characteristics was associated with poorer mental and physical health. Discrimination may

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contribute to poor mental and physical health in this marginalized population, potentially complicating the provision of substance abuse treatment.

**Keywords:** Depression, discrimination, drug use, mental health

## INTRODUCTION

Discrimination has been defined as the “process by which a member, or members, of a socially defined group is, or are, treated differently because of his/her/their membership of that group” (1). Discrimination exists at multiple levels. Individual experiences of discrimination refer to discriminatory interactions between individuals that can be directly perceived. These experiences are believed to generate stress and alter physiological processes that may adversely affect health (2). There are also structural and institutional forms of discrimination such as segregation, which are believed to harm health by limiting the socioeconomic opportunities, mobility, health care access and the life chances of individuals who are being discriminated against (2).

Discriminatory treatment throughout society has been well documented in the academic literature (3). Mounting evidence suggests that discrimination has a negative impact on mental and, to a lesser extent, physical health. For example, discrimination due to one’s race has been shown to be associated with elevated blood pressure in Blacks (4, 5), with poor global ratings of physical health (2, 6, 7), with poor global ratings of mental health (2, 8, 9), and with depression (10, 11). The adverse effects of discrimination on health are not limited to race. Experiences of discrimination also have been shown to adversely affect the health of other marginalized groups including women (12), persons who are overweight (13), and persons of bisexual and homosexual sexual orientation (14).

It also has been shown that people who experience discrimination due to multiple attributes (e.g., race, gender, sexual orientation) may have poorer health than those who experience discrimination due to one attribute (15, 16). In one study, White gay men reported mainly antigay discrimination while lesbian women reported both antigay and gender discrimination and Black, gay women reported racial discrimination, antigay discrimination, and gender discrimination (14). Another study found that lesbian and gay Blacks reported higher rates of psychological distress than would be predicted based on the sum of their risk from experiences of racial, gender, and sexual orientation discrimination (17).

For two reasons persons who use illicit substances such as cocaine, heroine, or crack may be particularly vulnerable to discrimination. First, negative attitudes toward illicit substance users may be more pervasive than negative attitudes toward other marginalized groups (18). A body of work has documented the widespread stigma of illicit drug use (19, 20). For example, the majority of Americans perceive cocaine users to have “no future,” to be

“losers,” to be “self-centered,” and to be “lazy;” they believe that drug use and criminal activity are linked (21). As a result, substance users tend to be poorly integrated into society and isolated from available services making them particularly vulnerable to the health effects of discrimination. Second, illicit drug users often possess multiple stigmatizing attributes (22). For example, even though the rates of drug use are comparable across racial groups, Blacks are more likely than Whites to be arrested, convicted, and sentenced to prison due to drug related offences (23). Compared to adults who do not use illicit drugs, adults who use illicit drugs are more likely to have a serious mental illness and to be unemployed (24).

Despite illicit drug users’ potentially heightened vulnerability to discrimination, we do not know of any peer-reviewed research that has examined the health effects of discrimination on illicit drug users. In a recent study, we reported that in a minority population of illicit substance users discrimination due to drug use was the most common form of discrimination experienced, and that discrimination due to drug use was reported as the type of discrimination that had most impacted the lives of study participants (22). In this follow-up study, we were interested in the association between interpersonal forms of discrimination and the health of illicit drug users. Specifically, we examine two research questions: 1) What is the relation of experiences of interpersonal discrimination due to illicit drug use and the mental and physical health of persons who use illicit drugs? 2) Are illicit drug users who possess more than one stigmatizing attribute at heightened risk for poor mental and physical health?

## **METHODS**

### **Study Design and Sample**

In this cross-sectional study, we recruited illicit drug users from Central Harlem, East Harlem, and the South Bronx in New York City. These neighborhoods were chosen because they share similar patterns of income, education, crime, and have disproportionately high rates of smoking, substance abuse, and HIV infection (25–27). Persons 18 years of age or older who used cocaine, crack, or heroin in the previous two months were eligible for inclusion in the study. Participants were recruited during the period of August 2000 through January 2001 using a variety of street-outreach techniques. Project outreach workers approached substance users on the street, placed advertisements in service agencies, and handed out pamphlets to interested persons. New participants also were recruited by word of mouth from enrolled participants. These recruitment methods have been previously shown to be particularly important when working with active substance users, and probably represent the most effective documented

method of recruitment for this group (28–30). The study was approved by the Institutional Review Board of the New York Academy of Medicine.

### **Data Collection**

Data was collected through structured, confidential, interviews conducted by trained interviewers at a storefront research center in Central Harlem. Participants first underwent a face-to-face screening interview to determine eligibility. Once participants were determined to be eligible for the study, trained interviewers explained the research protocol and obtained informed consent. The 45-minute survey was administered in English or Spanish. All participants were offered counseling and appropriate service referral as well as \$15 compensation for participating in the study.

### **Survey Measures**

#### **Dependent Variables**

To assess perceived physical functioning and general mental health we used two of the eight subscales included in 36-Item Short Form Health Survey (SF-36): the physical functioning scale and the general mental health score. The SF-36 developed for use in the Medical Outcomes Study, is a self-report instrument that assesses current (in the last 4 weeks) perceived health status and has been used in substance abusing populations (31). The physical functioning scale is based on responses to 10 items, whereas the general mental health score is based on responses to 5 items. Both are standardized and range from 0–100. On each subscale, lower scores are associated with poorer health; higher scores with better health. Depression in participants was assessed using the Center for Epidemiologic Studies Depression (CES-D) Scale, which is one of the most widely used self-report instruments to measure current depressive symptomatology (32, 33). It is based on responses to 20 items and ranges from 0–60. Lower scores are associated with less depressive symptomatology whereas higher scores are associated with more depressive symptomatology. We also asked participants if they had ever been told by a health care provider if they had any of a list of health problems as an additional list of mental health. A list of 12 health problems taken from the Nutrition Examination Survey Epidemiologic Follow-up Study were read (e.g., high blood pressure, cancer, diabetes) and participants responded yes or no to whether they had or have each one (34, 35). They also were given the option to volunteer if they had any other health problem. Responses were

summed to create a scale measuring the number of chronic conditions for each individual ranging from 0–11.

#### Independent Variables

The measure of discrimination used was modified from previous studies (36, 37). Participants were asked, “Have you ever been prevented from doing something, or been hassled or made to feel inferior because of any of the following?” Participants were offered a list to choose from including age, race, sex, sexual orientation, being poor, drug use, having been in jail or prison, or other. Participants could select as many of these types of discrimination as were applicable. We created a summary score of discrimination based on the number of different types of discrimination experienced by participants. Participants also were asked which type of discrimination had most impacted their life.

In order to assess the relationship between discrimination and health in illicit drug users it is important to control for additional factors that may confound or mediate this relationship. The age, sex, race (Black Non-Hispanic, Hispanic/Latino, or Other), educational level, annual household income before taxes, and marital status (single, married, other) of participants were obtained. Participants were asked if they were homeless in the last 6 months and if they had ever been arrested or spent time in jail. Drug use in the last 2 months was assessed. For example, participants were asked if they used cocaine: never (coded as 0), once a month or less (coded as 1), 2–3 days a month (coded as 2), about once a week (coded as 3), 2–3 days a week (coded as 4), 4–6 days a week (coded as 5) or everyday (coded as 6) over the past 2 months. The same scale was used to assess use of crack, heroin, or injected illegal drugs. A summary variable to assess the frequency of drug use across all types of drugs was created by summing responses to these variables. This variable is important to control for because persons who use illicit drugs less often may be less likely to experience discrimination compared to persons who use illicit drugs more often and as a result, face a lower cumulative burden from discrimination.

Participants’ social support was assessed using responses to 7 items previously used in the Human Immunodeficiency Virus Epidemiology Research Study (38). We asked if in the last 6 months was there someone

1. who would help take care of you if you were sick in bed for several weeks;
2. you could turn to if you needed help with small jobs around the house;
3. you could turn to if you needed to borrow several hundred dollars for a medical emergency;
4. you could turn to if you needed advice to help you make a decision;
5. to talk to if you were upset, nervous, or depressed;
6. who you could turn to if you needed to borrow \$10;
7. around to confide in or talk about yourself or your problems?

For each variable those who answered probably or definitely yes were coded as a 1 whereas those who answered probably or definitely not were coded as a 0. Responses were summed to create an overall measure of social support ranging from 0–7. The richness of the respondent's social network was assessed by asking participants how many relatives and friends they have that they feel close to. Possible responses included none (coded as 0), 1 (coded as 1), 2–4 (coded as 2), 5–9 (coded as 3), and 10 or more (coded as 4).

### Statistical Analysis

Two-tailed student t-tests were used to determine the association between each type of discrimination and scores on each of the four self-assessed health outcomes. Bivariate associations between each of the independent variables and each of the four self-assessed health outcomes were assessed. In separate multivariable regression models, we assessed the association between each type of discrimination and the participants' scores on each of the four self-assessed health outcomes. We adjusted for age, education, race, gender, income, education, social support, social network, and the frequency of drug use in the models predicting the general mental health score and depression. In the models predicting physical functioning and the number of health problems we further adjusted for current number of cigarettes smoked per day as well as for the participants' general mental health (assessed from the SF-36). All calculated *p* values were two-tailed, and 95% confidence intervals were used to guide interpretation.

### RESULTS

A total of 1,008 participants were recruited for this study. Selected demographic characteristics of the study population are displayed in Table 1. The majority of participants were male (63.9%) and single (62.3%). The mean age of participants was 40.4 (SD=8.2). Nearly one-half of the sample was Black (49.7%) and 41.7% were Hispanic. Approximately one-half of the respondents (48.9%) did not graduate from high school. There was a high prevalence of previous incarceration (91.2%), and 50% of the participants had been homeless in the previous 6 months. Approximately one-half (45.9%) of the participants had used intravenous drugs in the previous 2 months, and more than 60% had used cocaine (62.3%) and heroin (63.2%). On a scale ranging from excellent to poor, most participants reported their overall health status was moderate (good=31.6%; fair=48.9%). Mean scores on the SF-36 scale measuring mental health and physical functioning were

**Table 1.** Selected characteristics of a sample of substance users in New York City (N=1,008)<sup>a</sup>

<b>Demographic information</b>		
Gender: n (%)		
Male	639	63.9
Female	347	34.7
Transgendered	11	1.10
Race: n (%)		
Hispanic	419	41.7
Black	500	49.7
Other	87	8.7
Age (years): mean (SD)	40.4	8.2
Marital Status: n (%)		
Single	626	62.3
Married	148	14.7
Other	231	23.0
Years of education: n (%)		
Less than high school	493	48.9
GED or high school graduate	301	29.9
Some college	178	17.7
College graduate	33	3.3
Annual household income/10,000: mean (SD)	0.79	0.86
<b>Homeless</b> (past 6 months): n (%)	503	50.00
<b>Previously arrested:</b> n (%)	917	91.2
<b>Previously spent time in jail:</b> n (%)	720	72.1
<b>Drug use and treatment:</b> n (%)		
Drug use (past 2 months)		
Cocaine	624	62.3
Crack	668	66.5
Heroin	635	63.2
Intravenous use	458	45.9
Currently enrolled in drug treatment	555	55.3
<b>Health</b>		
Overall health: n (%)		
Excellent	71	7.1
Good	318	31.6
Fair	492	48.9
Poor	122	12.1
Mental health: mean (SD)	58.4	21.7
(0–100; 100 is good mental health)		
Depression: mean (SD) (0–60; 60 high depression)	24.7	12.8
Physical functioning: mean (SD)	73.3	29.6
(0–100; 100 is good physical health)		
# of chronic conditions: mean (SD)	2.12	1.70

<sup>a</sup>N may not add up to 1,008 due to missing values.

58.4 and 73.3, respectively. The mean score on the CES-D scale was 24.7 and the average number of chronic physical health problems was 2.12.

Table 2 shows the prevalence of each domain of discrimination reported by participants. Overall, 82.7% of participants reported some form of discrimination. More participants reported experiencing discrimination due to drug use (75.3%) than any other category. Discrimination due to previous incarceration was the second most frequently reported domain (40.3%), followed by poverty (32.7%) and race (31.3%). Fewer participants reported experiencing discrimination because of their gender (14.2%), and 10% reported experiencing discrimination because of their sexual orientation. Most participants (81.7%) reported experiencing discrimination because of more than one attribute. In response to the question, which type of discrimination most impacts your life 50.6% said discrimination due to drug use, 10.6% said discrimination due to jail time, and 6.5% said discrimination due to race/ethnicity.

Table 3 shows bivariate associations between each domain of discrimination and the mental and physical outcomes. Mean health scores were calculated for each type of discrimination comparing persons who experienced discrimination versus those who did not. The following types

**Table 2.** Prevalence of different types of discrimination (N=1,008)

	N	%
<b>Ever experienced discrimination due to . . .</b>		
Drug use	759	75.3
Jail time <sup>a</sup>	406	40.3
Poverty	330	32.7
Race	315	31.3
Age	200	19.8
Sex	143	14.2
Sexual orientation	101	10.0
<b>Number of types of discrimination experienced</b>		
0	184	18.3
1	231	22.9
2	205	20.3
3	150	14.9
4	110	10.9
5	72	7.1
6	29	2.9
7	27	2.7

<sup>a</sup>This prevalence is calculated using the total sample. Of the 720 people who ever spent time in jail, 368 (51.1%) reported experiencing discrimination because of it.



**Table 3.** Bivariate association between each type of discrimination and health<sup>a</sup>

Discrimination due to	Mental health <sup>b</sup> (N=811)		Depression <sup>c</sup> (N=734)		Physical functioning <sup>d</sup> (N=809)		Number of chronic conditions <sup>e</sup> (N=810)	
	Mean	<i>p</i>	Mean	<i>p</i>	Mean	<i>p</i>	Mean	<i>p</i>
Drug Use		<0.001		<0.001		0.41		<0.001
Yes	56.8		25.8		72.9		2.23	
No	63.3		21.5		74.7		1.81	
Jail Time		0.57		0.31		0.31		0.21
Yes	58.9		25.1		74.5		2.20	
No	58.1		24.4		72.5		2.07	
Poverty		0.002		<0.001		0.37		0.004
Yes	55.4		27.0		72.1		2.4	
No	59.9		23.6		73.9		2.0	
Race		0.65		0.86		0.65		<0.001
Yes	58.9		24.8		73.0		2.0	
No	58.2		24.6		73.4		2.4	
Age		0.002		0.005		0.03		0.009
Yes	54.2		27.2		69.3		2.4	
No	59.4		24.1		74.3		2.05	
Sex		0.05		0.005		0.86		<0.001
Yes	55.0		27.7		72.9		2.4	
No	59.0		24.2		73.4		1.9	
Sexual orientation		0.03		0.03		0.97		0.02
Yes	53.9		26.5		73.4		2.59	
No	58.9		24.5		73.3		2.07	

<sup>a</sup>Bivariate associations were calculated using the student t-test.

<sup>b</sup>The SF-36 mental health score is a continuous measure from 0–100 where 100 is better mental health.

<sup>c</sup>The CES-D depression score is a continuous measure form 0–60 where 60 is a high level of depression.

<sup>d</sup>The SF-36 physical functioning score is a continuous measure from 0–100 where 100 is better physical functioning.

<sup>e</sup>The number of chronic conditions is a continuous measure, where a higher number indicates the presence of more chronic conditions.

of discrimination were associated with poorer general mental health: drug-use ( $p<.0001$ ), poverty ( $p=.0020$ ), age ( $p=.002$ ), sex ( $p=.05$ ) and sexual orientation ( $p=.03$ ). The following domains of discrimination were associated with higher CES-D scores (more depressive symptomatology): drug-use ( $p<.0001$ ), poverty ( $p<.0001$ ), age ( $p=.005$ ), sex ( $p=.005$ ), and sexual orientation ( $p=.03$ ). The following domains of discrimination

**Table 4.** Multivariable linear regression analysis showing the relations between types of discrimination experienced and health

Discrimination due to...	Mental health <sup>a,c</sup> (N = 811)			Depression <sup>a,d</sup> (N = 734)			Physical functioning <sup>b,e</sup> (N = 809)			Number of chronic conditions <sup>b,f</sup> (N = 810)		
	B	se		B	Se		B	se		B	se	
Model 1: Drug Use	-6.96*	1.59		4.78*	0.97		0.70	2.28		0.37*	0.14	
Model 2: Jail time	0.12	1.43		1.14	0.89		-0.45	2.01		0.29*	0.12	
Model 3: Poverty	-6.72*	1.46		4.17*	0.91		0.35	2.11		0.35*	0.13	
Model 4: Race	-3.11*	1.49		1.91*	0.94		-0.50	2.10		0.46*	0.12	
Model 5: Age	-5.60*	1.74		3.22*	1.09		-1.92	2.48		0.30*	0.15	
Model 6: Sex	-7.14*	1.99		5.64*	1.25		3.87	2.83		0.62*	0.17	

Model 7: Sexual orientation	-9.01*	2.35	4.87*	1.43	0.58	3.35	0.48*	0.20
Model 8: Number of types of discrimination	-1.82* <sup>g</sup>	0.38	1.27*	0.24	0.06	0.55	0.15*	0.03

\**p*-value <0.05.

<sup>a</sup>Models controlled for age, income, education, sex, race, marital status, social support, social networks, and frequency of drug use.

<sup>b</sup>Models controlled for age, income, education, sex, race, marital status, social support, social networks, frequency of drug use, mental health, and current cigarette smoking.

<sup>c</sup>The SF-36 mental health score is a continuous measure from 0–100 where 100 is better mental health.

<sup>d</sup>The CES-D depression score is a continuous measure from 0–60 where 60 is a high level of depression.

<sup>e</sup>The SF-36 physical functioning score is a continuous measure from 0–100 where 100 is better physical functioning.

<sup>f</sup>The number of chronic conditions is a continuous measure from 0–11 where a higher number indicates the presence of more chronic conditions.

<sup>g</sup>The SF-36 mental health score for an individual in the sample at the mean age, income, frequency of drug use, level of social support and social network, who is male, has less than a high school education, and who experiences no discrimination is 0.68. The mental health score decreases by 1.82 for each additional type of discrimination the individual has.

**Table 5.** Multivariable linear regression analysis showing the relation between discrimination due to drug use and health

	Mental health <sup>a</sup> (N=811)		Depression <sup>b</sup> (N=734)		Physical functioning <sup>c</sup> (N=809)		Number of chronic conditions <sup>d</sup> (N=810)	
	B	se	B	se	B	Se	B	se
Age	-0.03	0.10	0.03	0.06	-0.89*	0.14	0.04*	0.01
Income	-0.42	0.80	0.22	0.54	0.16	1.13	0.004	0.07
Education								
Less than high school	-4.18*	1.39	1.53	0.86	-5.45*	2.00	-0.03	0.12
High school graduate	ref	ref	ref	ref	ref	ref	ref	ref
Sex								
Male	ref	ref	ref	ref	ref	ref	ref	ref
Female	-4.39*	1.46	1.92*	0.91	-6.72*	2.10	0.23	0.12
Transgender	-6.57	5.94	3.67	3.67	-16.2	8.43	0.56	0.50
Race								
White	ref	ref	ref	ref	ref	ref	ref	ref
Hispanic	0.10	3.92	-0.05	2.41	-11.2	5.66	0.48	0.33
Black	9.27*	3.90	-4.92*	2.39	-7.54	5.66	0.17	0.33
Other	9.40	5.05	-4.41	3.18	-4.79	7.25	0.24	0.43

	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Marital status												
Single	-0.28	1.93	-0.19	1.19	-1.66	2.75	0.15	0.16				
Married	-0.70	1.73	-0.88	1.07	0.96	2.45	0.24	0.15				
Other	1.57*	0.35	-1.14*	0.22	-0.21	0.50	0.08*	0.03				
Social support	1.59*	0.37	-0.94*	0.23	-1.02	0.53	0.06	0.03				
Frequency of drug use	-0.08*	0.03	0.06	0.02	0.02	0.04	0.001	0.002				
Discrimination due to drug use	-6.96*	1.59	4.77*	0.97	0.70	2.28	0.37*	0.14				
Mental health					0.41*	0.05	-0.02*	0.003				
Current number of cigarettes smoked per day					-0.13	0.08	0.01*	0.005				

\**p*-value <0.05.

<sup>a</sup>The SF-36 mental health score is a continuous measure from 0–100 where 100 is better mental health.

<sup>b</sup>The CES-D depression score is a continuous measure from 0–60 where 60 is a high level of depression.

<sup>c</sup>The SF-36 physical functioning score is a continuous measure from 0–100 where 100 is better physical functioning.

<sup>d</sup>The number of chronic conditions is a continuous measure from 0–11 where a higher number indicates the presence of more chronic conditions.

were associated with having more chronic health conditions: drug use ( $p=.0007$ ), poverty ( $p=.004$ ), race ( $p=.0009$ ), age ( $p=.009$ ), sex ( $p=.0003$ ), and sexual orientation ( $p=.02$ ). Only discrimination due to age ( $p=.03$ ) was associated with poorer physical functioning.

Table 4 shows the results of separate multivariable models predicting change in the mental and physical health scores for each type of discrimination. A multivariable model also was estimated to assess the potential impact of multiple types of discrimination. The following types of discrimination were associated with a decrease in the general mental health score: drug use, poverty, race, age, sex, and sexual orientation. The same types of discrimination were associated with significant increases in the depression score. All types of discrimination were associated with an increase in the number of chronic physical health conditions. In contrast, none of the types of discrimination were associated with the physical functioning score.

To illustrate the effects of the other factors adjusted for in these models, in Table 5 we show the full model specification for the model that includes the discrimination due to drug use variable. Discrimination due to drug use was associated with poorer general mental health. In addition, having less than a high school education, being female, using drugs more frequently, and low levels of social support and network integration were associated with poorer general mental health. These same variables were associated with depression. Older participants, persons with less than a high school education, females, and individuals in poorer mental health were more likely to report poorer physical functioning. Older participants, participants with less social support, who smoke more, who are in poorer mental health, and who have experienced discrimination due to drug use reported having more chronic physical health problems.

## DISCUSSION

In this cross-sectional study we found that illicit drug users experience a high burden of interpersonal discrimination; the majority of participants (81.7%) reported having experienced at least one form of discrimination in their lifetime. Discrimination due to drug use was the most prevalent form of discrimination reported and was also the type of discrimination that most affected the lives of study participants. The experience of discrimination due to drug use was associated with poorer mental health, depression, and a count of the number of chronic health problems among participants. The association between poor mental health and discrimination was consistent across different domains of discrimination, and appeared to be more robust than the relation between self-reported discrimination and physical health.

To our knowledge, this is the first study to document the prevalence of discrimination and its association to poor health in a population of illicit drug

users. The majority of studies examining the health impacts of discrimination have focused on African American adults living in the United States, but increasing attention is now being given to other racial groups and to persons with other stigmatized attributes (39, 40). Compared to other marginalized groups, illicit drug users in this study reported a higher prevalence of discrimination. For example, a study of Chinese Americans living in Los Angeles found that approximately 26% of the respondents reported experiencing discrimination because of their race (39), although the prevalence of discrimination experiences has been reported to be significantly higher among Blacks (3). In a national survey, homosexual and bisexual individuals reported more discrimination than heterosexuals and 42% attributed this to their sexual orientation (14). A study of persons with severe mental illness found that 53% reported some experience with discrimination. The most frequent sources of this discrimination were mental disability, race, sexual orientation, and physical disability (40).

Illicit drug users may be particularly vulnerable to the many pathways through which discrimination is believed to harm health. Interpersonal discrimination, which we found to be highly prevalent in this population of illicit drug users, may generate psychic distress that can lead to alterations in physiological processes and adversely affect health (2). Research on other stigmatized groups consistently has revealed a robust association between interpersonal discrimination and poor mental health and, to a lesser extent, discrimination and poor physical health (41). In addition to the stress generated by experiences of discrimination, illicit drug users may also be more exposed to other types of stress. For example, they may be more likely to experience chronic day-to-day stress at work or at home related to their drug use or major life traumatic events because they may be more likely to live in communities characterized by high prevalence of violence. Additional research is needed to discern the types of stress that are experienced by, and that affect drug users and the factors that may mediate these stress reactions.

One such factor is social support. In this study we showed that individuals with high social support and network integration are less likely to have poor mental and physical health in multivariable models. Social relations and social support may play a unique role in shaping the relation between discrimination and poor health. For example, individuals with stronger social networks and higher levels of perceived social support may be better able to cope with major life stressors (42, 43). By contrast, those who report lower levels of social support have been shown to be associated with increased risk of dying prematurely from several causes of death (44, 45). Resilience and vulnerability related to an individual's social support may affect her or his ability to cope with the stresses of discrimination and ultimately may affect the relationship between discrimination and health.

Illicit drug users also may be more vulnerable than other stigmatized groups to discrimination occurring at structural and institutional levels. For

example, illicit drug users may be more likely to live in disenfranchised neighborhoods where adverse conditions (e.g., inadequate medical care, high rates of violence) may directly harm health. Studies of the health of illicit drug users in the future should examine structural and institutional pathways through which discrimination may harm health.

The finding that discrimination was not associated with physical functioning but was associated with the other mental and physical health outcome measured by this study was surprising. It is plausible that discrimination harms mental health through the generation of stress, and that negative emotional states such as depression have direct effects on physiological processes or patterns of behavior that affect disease risk (46). Thus, measures of mental health status and health behaviors then can be viewed as an intermediary mechanism by which perceptions of discrimination ultimately may affect physical health. Physical functioning is not a measure of health per se but rather can be viewed as a potential consequence of poor mental and physical health with its own complex set of intermediary mechanisms linking potential stressors to physical functioning. Our results suggest that discrimination is not one of these factors.

An important gap in the peer-reviewed literature is that the cumulative burden of discrimination is measured infrequently, potentially leading to conservative estimates of the health effects of discrimination (47). We show that persons who used drugs more frequently were in poorer mental health (see Table 5), which may be a function of their having increased exposure to discrimination (although there are other potential explanations for this association). Studies of the health effects of discrimination are limited in that they frequently focus on discrimination because of one stigmatized attribute and thereby also may be underestimating the cumulative impact of discrimination on health. We showed that illicit drug users, like other marginalized populations (14, 17), experience discrimination because of multiple attributes and that, in almost all cases, the discrimination due to these other attributes adversely affected health. Furthermore, we showed that the respondents who experience multiple forms of discrimination were at higher risk for poor health. Longitudinal research that takes into account the cumulative burden of discrimination for several stigmatized attributes is needed to further explore the relationship between experiences of discrimination and health in marginalized populations.

### **Limitations**

There are several limitations to this study. First, and most importantly, given that this was a cross-sectional study, we cannot definitively establish a temporal relation between the hypothesized exposure (discrimination) and outcome (poorer mental and physical health). Longitudinal work will be needed to definitively establish a causal relation between experience of



discrimination among drug users and their mental and physical health. Second, we sampled illicit drug users from specific New York City neighborhoods. While this allowed us to standardize, to some extent, structural factors that also may be associated with physical and mental health of the illicit drug users enrolled in this study, it also may limit the generalizability of the results documented here. Third, we used self-reported measures of discrimination, as well as self-reported measures of physical and mental health. It is possible that individuals who reported experiencing discrimination also may be more likely to inaccurately assess their health status. However, self-reported health has been shown to be a valid predictor of morbidity and mortality (34) and discrimination has been shown consistently to be a robust predictor of health (27). Our study, using well-accepted measures of both discrimination and health outcomes, shows that experiences of discrimination are associated with health among illicit drug users. Additional limitations in our study include the fact that we did not measure institutional levels of discrimination directly, which may affect the relation we found. Also, we did not distinguish between the frequency or the intensity of exposure of discrimination (e.g., day-to-day, major lifetime exposure). Future studies in this area should attempt to take these limitations into account.

### Implications

Research on the consequences of stigma and discrimination in illicit drug users is in its infancy. While this study showed an association between discrimination because of drug use and the health of illicit drug users, research on other stigmatized conditions such as HIV/AIDS and mental illness suggests that there are likely to be many other consequences of stigma and discrimination for drug users (48, 49). For example, discrimination due to drug use may shape drug-use behavior, the availability of resources, access to social welfare systems, and compliance with medications (50). Not unlike other marginalized groups, illicit drug users may be especially vulnerable to health and other consequences of discrimination because they frequently possess multiple stigmatizing attributes such as homelessness or having spent time in jail or prison. Future research should explore additional impacts of discrimination in this population as well as the extent to which the presence of multiple stigmatizing attributes exacerbates these associations. Public health interventions aimed at improving the health of drug users should address discrimination as a factor that may exacerbate the health consequences of illicit drug use.

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