Profile of Justice-Involved Marijuana and Other Substance Users: Demographics, Health and Health Care, Family, and Justice System Experiences

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ABSTRACT: Substance users are more likely to have co-occurring health problems, and this pattern is intensified among those involved with the criminal justice system. Interview data for 1977 incarcerated men in 5 states from the Multi-site Family Study on Incarceration, Parenting, and Partnering that was conducted between December 2008 and August 2011 were analyzed to compare pre-incarceration substance use patterns and health outcomes between men who primarily used marijuana, primarily used alcohol, primarily used other drugs, and did not use any illicit substances during that time. Using regression modeling, we examined the influence of substance use patterns on physical and mental health. Primary marijuana users comprised the largest portion of the sample (31.5%), closely followed by nonusers (30.0%), and those who primarily used other drugs (30.0%); primary alcohol users comprised the smallest group (19.6%). The substance user groups differed significantly from the nonuser group on many aspects of physical and mental health. Findings suggest that even among justice-involved men who are not using "hard" drugs, substance use merits serious attention. Expanding the availability of substance use treatment during and after incarceration might help to promote physical and mental health during incarceration and reentry.

KEYWORDS: Marijuana, prisoners, substance use, drugs, alcohol

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Background

In 2015, the Bureau of Justice Statistics estimated that US state and federal prisons held 1.53 million prisoners.[1] Incarcerated persons in the United States are overwhelmingly men, and nearly half of federal prisoners are sentenced for drug offenses.[1,2] It is well-documented that incarcerated men tend to have unmet physical and mental health needs,[3–6] strained or unstable personal relationships,[7,8] and substance use problems.[9,10] Often, these problems are complex and interconnected.[10–14]

The types of mental and physical illnesses experienced by incarcerated men are varied. Depression is the most common mental disorder, affecting 21% of state and federal prisoners. Posttraumatic stress disorder (PTSD) affects 7%, and other common disorders include manic-depression/bipolar disorder/mania (12%), schizophrenia and other psychotic disorders (5%), other non-PTSD anxiety disorders (8%), and personality disorders (6%).[15] Although evidence on the prevalence of attention-deficit/hyperactivity disorder (ADHD) is limited, a 2012 study found that 10.5% of adult prisoners experienced ADHD—more than double the prevalence in the general adult population.[16] About 39% of those incarcerated in federal prisons and 43% of those in state prisons have a chronic medical condition such as diabetes mellitus, asthma, cardiovascular conditions, human immunodeficiency virus (HIV)/AIDS, paralysis, prior malignancy, prior stroke or brain injury, chronic kidney problems, chronic cirrhosis or hepatitis, or arthritis.[17]

Substance use and misuse can result from, produce, or exacerbate negative mental, physical, and social outcomes for users.[18] Some of these adverse effects on health are immediate, some appear after continuous use, and some occur after overdose.[19] Use of illicit drugs, including marijuana, increases risk for many of the chronic medical conditions that are common among incarcerated persons, including cardiovascular and lung conditions, cancer, HIV/AIDS, and hepatitis. Similarly, alcohol use is associated with cardiovascular conditions, stroke, cancer, sexually transmitted infections, and injuries.[20] Beyond the physical effects, substance use is often associated with mental health issues. Alcohol use is associated with both depression and sleep disorders.[20] Among US adults with a substance use condition, 39% experienced a co-occurring mental health condition in the previous year, whereas 16.2% experienced a mental health condition but not a substance use condition.[19] Among incarcerated persons, co-occurrence is even more common: 74% of those with mental health conditions in state prisons report co-occurring substance use conditions, whereas 56% report substance use conditions but no mental health conditions.[21]

The significant physical and mental health needs of incarcerated and reentering persons are a critical issue for correctional systems, which are charged both with responding to these needs during an incarceration and with reducing

recidivism (and its correlates, including poor physical and mental health) among those released. Furthermore, men's substance use patterns and the physical and mental health conditions with which they may be associated may be equally critical issues for the families into which men return on reentry. This study of incarcerated fathers in committed relationships, while not a nationally representative sample of incarcerated men, offers an opportunity to understand pre-incarceration substance use patterns and physical and mental health among incarcerated men who are likely to return home to partners and children on release.[22] This study compared the physical and mental health status (including overall physical health, psychological health, depression, PTSD, and ADHD) of non–substance-using men during an incarceration with those of primary marijuana users, primary alcohol users, and primary other drug users. We hypothesized that men's pre-incarceration substance use would uniquely relate to self-reported physical and mental health during the incarceration, depending on the primary substance of use.

Methods

Participants and data source

To better understand patterns of substance use and physical and mental health among incarcerated men who are likely to reenter to partners and children, we used interview data from the Multi-site Family Study on Incarceration, Parenting, and Partnering (MFS-IP) study.[23] The study recruited incarcerated adult men in state correctional facilities in Indiana, Ohio, New York, New Jersey, and Minnesota who self-identified as being married, in a committed intimate relationship, or in a co-parenting relationship. These sites were selected for the MFS-IP evaluation of couple-based healthy relationship programming based on having sufficient program intensity and projected enrollment to support evaluation, providing couple-based relationship services, and having a stable program design at the time of the study. To be eligible, participants had to speak English, be physically and mentally capable of participating in an interview, and agree to provide contact information for their intimate or co-parenting partners. In addition, men had to be 18 years old or older, not under a restraining order with the co-parent in the co-parenting relationship, and confirmed by the co-parent as being in a co-parenting relationship. Data for this study come from 90-minute baseline interviews conducted between December 2008 and August 2011 across all 5 sites; participants who completed the interviews that did not answer the questions related to substance use were not included this study.

Measures

The MFS-IP baseline interview included an extensive set of questions about substance use and misuse during the 6 months prior to incarceration, as well as items on mental and physical health and demographic characteristics.

Independent variables. Men were asked which substances they used "even just once" in the 6 months prior to incarceration. If they provided more than 1 response, they were then asked which substance they used most. Based on responses to these 2 questions, study participants were assigned to 1 of 4 substance use categories. The primary marijuana use group included men who reported that they only used marijuana or hashish during the 6 months prior to their incarceration, or that marijuana (or hashish) was the drug they used most. The primary other drug use group included men who reported that they only or mostly used a drug other than marijuana. (Other drugs included powder cocaine; crack cocaine; heroin; methamphetamine; other amphetamines such as monster, crank, or ice; hallucinogens or designer drugs such as ecstasy, lysergic acid diethylamide, acid, mushrooms, mescaline, peyote, green, phencyclidine or angel dust; prescription medications without a prescription, for other reasons than were prescribed, or in larger amounts or more frequently than the doctor ordered, including sedatives, tranquilizers, stimulants, pain relievers, opiates, anabolic steroids, or methadone.) The primary alcohol use group included men who reported using more than one substance but mostly used alcohol. The no drug use group included men who reported no drug or alcohol use or who reported using alcohol (even just once) but no other substances during the reference period.

Dependent variables. Psychological health measures included scales for assessing PTSD, depression, and ADHD.

Posttraumatic stress disorder. Posttraumatic stress disorder was measured by a 4-item scale: (1) "In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, in the past 1 month, you have had nightmares about it or thought about it when you did not want to?"; (2) "In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, in the past 1 month, you tried hard not to think about it or went out of your way to avoid situations that reminded you of it?"; (3) "In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, in the past 1 month, you were constantly on guard, watchful, or easily startled?"; and (4) "In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, in the past 1 month, you felt numb or detached from others, activities, or your surroundings?" The number of affirmative responses to these questions was summed to make a single PTSD score ranging from 0 to 4.

Depression. Participants were asked how often (all of the time, most of the time, some of the time, a little of the time,

or none of the time) they experienced specific symptoms of depression, using a 9-item version of the Center for Epidemiologic Studies Depression Scale (CES-D).[24] For comparability with the CES-D 10, we first collapsed the 5-response options used in the MFS-IP interview into 4 (with all of the time and most of the time combined). The 4-response options were then assigned numerical values of 0 to 3. Each respondent's scores for the 9 depression items were summed, which resulted in depression scores ranging from 0 to 27. We then applied a cutoff of 9 to the total score, such that men with a depression score of 9 or higher were classified as likely meeting clinical criteria for depression. This cutoff was selected because it is equivalent to 33% of the maximum possible depression score, which is the approach used in applying the cutoff of 10 for the CES-D-10.

Attention-deficit/hyperactivity disorder. A modified version of the Copeland Symptom Checklist for Attention Deficit Disorders[25] was administered. Participants were asked to use a Likert scale to respond to 3 statements reflecting distractibility and impulsivity. Participants were asked how strongly they agreed or disagreed with the following statements regarding the past month: (1) "You are easily distracted," (2) "You get frustrated easily," and (3) "You do not think before acting." These items were summed to create a scale with possible values ranging from 0 to 9, where higher values indicate more symptoms of distractibility and impulsivity.

Three measures were related to health: general health, emotional and psychological health, and having a serious health problem that limits the amount of work a respondent could do. For the general health and emotional/psychological items, participants were asked about their general health at the time of the interview, and responses were measured on a Likert-type scale with options for "excellent," "very good," "good," "fair," and "poor." The same scale was used when men were asked about their overall mental and emotional health at the time of the interview. The men were also asked about whether they currently had "a serious health problem that limits the amount of work [they could] do," yielding a binary measure.

Covariates. The analyses controlled for self-reported age, race and ethnicity (non-Hispanic white, non-Hispanic black, non-Hispanic other, Hispanic white, Hispanic black, Hispanic other, and multiracial), the state in which the respondent was incarcerated (Indiana, Minnesota, Ohio, New York, and New Jersey), length of incarceration at the time of the survey (years), and whether the respondent had health insurance before incarceration. Regressions for PTSD, depression, and ADHD also controlled for whether the respondent reported having received treatment for emotional or mental health.

Analytic approach

Descriptive statistics were used to characterize the study sample's demographic and family characteristics. Separate regression models were used to assess the association of substance use with the physical and mental health outcomes after controlling for the covariates. Ordinary least squares regression was used to model ADHD. Logistic regressions were used to model depression and the ability to work outcome because these were binary measures. Posttraumatic stress disorder, general physical health, and general emotional/psychological health outcomes were modeled using ordinal logistic regression. All regressions controlled for age, race/ethnicity, state in which the respondent was incarcerated, whether he had a high school diploma or GED, length of incarceration at the time of the interview, and whether he had health insurance before incarceration. Regressions for PTSD, depression, and ADHD also controlled for whether the inmate had received treatment for emotional or mental health. "No drug use" was the reference variable. All analyses were conducted using 2-sided tests of significance with 95% confidence. Stata version 13.1 and R version 3.3.3 were used for the statistical analysis.

Results

Sample characteristics

The study sample included 1977 incarcerated men; of which 625 were primary marijuana users (31.6%), 387 were primary alcohol users (19.6%), 373 were primary other drug users (18.9%), and 592 were nonusers (29.9%). Basic demographic characteristics of the full analytic sample and for the substance use groups are shown in Table 1. The men were, on average, in their mid-30s at baseline (33.5 years old). Primary other drug users tended to be older (average 37.0 years old), whereas primary marijuana users were younger (30.8 years old). The sample was racially and ethnically diverse: 59% of men were black and 27% were white; Hispanic/Latino participants comprised 11% of the sample. Although the racial characteristics of the primary alcohol users and nonusers were similar to those of the overall study sample, a higher proportion of primary marijuana users were black and a lower proportion were white (73.4% black, 13.3% white) compared with the full sample. Primary other drug users included a lower proportion of black participants and a higher proportion of white (35.7% black, 52.3% white). One-third of the men in the overall sample reported not having a high school diploma or General Education Development (GED). Primary marijuana users were, on average, the least educated group (61.1% had a high school diploma/GED or above) and primary other drug users were the most educated group (71.0% had a high school diploma/GED or above).

Substance use patterns

Detailed substance use patterns for the full sample and the 4 substance use categories are shown in Table 2. During the 6 months before their incarceration, alcohol and marijuana or

Table 1. Demographic and family characteristics.

	FULL SAMPLE OF INCARCERATED MEN (N = 1977)	PRIMARY MARIJUANA USERS (N = 625)	PRIMARY ALCOHOL USERS (N = 387)	PRIMARY OTHER DRUG USERS (N = 373)	NO DRUG USE (N = 592)
Age, mean (SE)	33.5 (8.7)	30.8 (7.3)	33.2 (8.2)	37.0 (9.1)	34.6 (9.3)
Race, %					
Black	58.9	73.4	56.6	35.7	59.8
White	27.3	13.3	29.5	52.3	25.0
Another race	8.8	8.0	7.8	9.1	10.1
Multiracial	5.0	5.3	6.2	2.9	5.1
Ethnicity, %					
Hispanic/Latino	10.9	10.2	8.5	11.0	13.2
Education, %					
High school diploma/General Education Development or above	67.5	61.1	69.5	71.0	70.6

Table 2. Substance use patterns.

	FULL SAMPLE OF INCARCERATED MEN (N = 1977)	PRIMARY MARIJUANA USERS (N = 625)	PRIMARY ALCOHOL USERS (N = 387)	PRIMARY OTHER DRUG USERS (N = 373)	NO DRUG USE (N = 592)
Proportion using substance even just once in the 6 mo before incarceration, %					
Alcohol	71.2	68.3	100.0	67.8	57.4
Marijuana or hashish	58.9	100.0	84.5	56.8	0.0
Powder cocaine	18.9	16.5	25.6	46.1	0.0
Crack cocaine	14.4	5.6	18.3	48.0	0.0
Heroin	7.3	2.2	4.7	30.3	0.0
Methamphetamine	7.4	3.5	6.2	26.8	0.0
Other amphetamines (such as monster, crank, and ice)	3.6	1.1	2.1	15.0	0.0
Hallucinogens or designer drugs (such as ecstasy, lysergic acid diethylamide, acid, mushrooms, mescaline, peyote, green, phencyclidine or angel dust)	12.6	17.8	15.2	20.9	0.0
Prescription medications without a prescription or for other reasons than were prescribed, or in larger amounts, or more often than the doctor ordered. This includes sedatives, tranquilizers, stimulants, pain relievers, opiates, or anabolic steroids	17.9	16.5	23.5	42.6	0.0
Methadone without a prescription or for other reasons than were prescribed, or in larger amounts, or more often than the doctor ordered	3.7	1.3	2.3	15.0	0.0

hashish were the most common substances used (even just once) for all participants (71.1% used alcohol, 58.8% used marijuana or hashish) and within each substance use group (68.4% of primary marijuana users also used alcohol, 84.4% primary alcohol users also used marijuana or hashish, 67.8% and 56.8% of other drug users used alcohol and marijuana or hashish,

Table 3. Substance user types and physical and mental health outcomes.

DEPENDENT VARIABLE	PRIMARY MARIJUANA USE (N=623)	PRIMARY ALCOHOL USE (N=387)	PRIMARY OTHER DRUG USE (N=373)
Substance use associated with . . .	Odds ratio (95% confidence interval) from ordinal logit regression *P* value		
More severe PTSD	1.37 (1.08–1.72) .01	1.30 (1.0–1.7) .05	1.13 (0.9–1.5) .38
General health	0.69 (0.56–0.86) .001	0.66 (0.52–0.84) .001	0.62 (0.49–0.79) <.001
General emotional or psychological health	0.70 (0.56–0.86) .001	0.59 (0.47–0.75) <.001	0.61 (0.48–0.78) <.001
	Odds ratio (95% confidence interval) from logit regression *P* value		
Having a serious health problem that limits the amount or kind of work one can do	1.17 (0.84–1.62) .35	1.15 (0.80–1.64) .44	1.50 (1.07–2.11) .02
More severe depression	0.32 (0.07–0.57) .01	0.14 (0.35–0.91) <.001	0.48 (0.20–0.77) .001
	Coefficient (95% confidence interval) from linear regression *P* value		
More severe ADHD	0.27 (0.06–0.48) .01	0.26 (0.03–0.50) .03	0.41 (0.18–0.65) <.001

Abbreviations: ADHD, attention-deficit/hyperactivity disorder; PTSD, posttraumatic stress disorder.

respectively, and 57.4% of nonusers reported consuming alcohol). Primary marijuana users generally used other drugs at a lower rate than primary alcohol users except hallucinogens or designer drugs (17.8%). Primary marijuana users and primary other drug users reported using alcohol at a similar rate: 68% reported using alcohol even just once during the 6 months before their incarceration.

Association of substance use with physical and mental health

Primary marijuana, primary alcohol use, and primary other drug use compared with nonuse were each significantly associated ($P < .05$) with most of the physical and mental health measures included as dependent variables. Regression results for the relationships tested are shown in Table 3. More severe PTSD was significantly associated with membership in the primary marijuana use and primary alcohol use groups (compared with the nonuser group); both user types were more likely than nonusers to experience PTSD symptoms. All substance user types were associated with poorer general health and poorer general emotional or psychological health relative to nonusers. Having a serious health problem that limits the amount or kind of work one can do was significantly associated with primary other drug use; it was not significantly associated with primary marijuana use or primary alcohol use. All 3 user types were significantly and positively associated with more severe depression and more severe ADHD when compared with nonusers. Although the regression models significantly predicted the outcomes at a $P < .05$ level, the models generally explained less than 10% of the proportion of the variation in these outcomes ($R^2 < 0.10$/pseudo $R^2 < 0.10$).

Discussion and Conclusions

The MFS-IP study provided a unique opportunity to study the relationship between substance use patterns and psychological and physical health conditions. Primary marijuana use was the largest user type, more than one-and-one-half times larger than the primary alcohol and primary other drug groups and larger than the nonuser group. After controlling for demographics, health insurance status before incarceration, length of incarceration at the time of the interview, and whether the respondent had received treatment for emotional or mental health conditions (PTSD, ADHD, and depression regressions only), we found no clear associations between type of pre-incarceration substance use and most physical and mental health measures included as dependent variables in our regression. The exceptions were more severe PTSD (which was associated with primary marijuana use and primary alcohol use) and having a serious health problem that limits work (associated with other drug use). Whether the associations we found are causal, or directional, is not addressed or answered by these analyses, but the associations are apparent.

We hypothesized that differential patterns of physical and mental health conditions would emerge based on the different substance use types. That different substances yield different outcomes is in line with most Americans' beliefs that marijuana is less harmful to society than alcohol and similar opinions that

were voiced by incarcerated men and their partners in later MFS-IP study interviews.[26] Generally, however, we did not observe a differential pattern among the substance user types; nearly every outcome was significantly associated with all 3 user types, compared with nonusers.

Limitations

Substance use and outcome measures were self-reported by the men during the MFS-IP baseline interview, and the measures specific to ADHD, PTSD, and depression were not diagnoses standardized to the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition). Categories of substance use included men who used even just once during the 6 months prior to incarceration, and it is likely that substance dose and availability are confounders.

The conditions examined are associated with and potentially confounded with a number of social, health, and economic variables that we did not examine, including issues related to housing, other co-occurring mental illness, social support, and the ability to find work.

The models explain only small proportions of the variation in physical and mental health conditions, suggesting that use of or preference for these substances is neither sufficient nor necessary to produce the conditions captured by the dependent variables. There are strong associations observed between substance use and most problem conditions, but patterns of substance use preference are not predictive of these outcomes.[27]

Finally, the MFS-IP study sample is not nationally representative of the prison population as a whole nor of the prison populations in the 5 selected states. Still, it offers a detailed portrait of substance use and physical and mental health among incarcerated men who are in intimate or co-parenting relationships during their incarceration, which has particular relevance for informing the design and targeting of substance use treatment services during incarceration and reentry.

Implications

This study suggests that different types of substance use are weak differentiators of mental and physical health during incarceration, and we believe that this is because substance use patterns before incarceration are just one of the many personal, social, and economic factors that affect what happens to men during incarceration. Rather, addressing any substance use with inmates through behavioral and medicinal therapy has the potential to improve individual and public health and improve inmate outcomes, reduce recidivism, and may be a cost-effective time at which to interrupt the cycle of substance use and crime.[28–32] Many different types of rehabilitative programs have been tried and some have shown promise, including programs that bridge from incarceration to reentry.[33–35]

Primary marijuana use was our largest substance use category, and as some states move to legalize marijuana, access to marijuana is likely to increase. How this will affect the subpopulation of men who go to prison and reenter the community is unknown; increased access may enable greater marijuana use but legality means those men will not be rearrested and charged for marijuana-related drug crimes. What is clear is that marijuana legalization will not affect the underlying myriad of social, environmental, and economic factors that affect inmates nor that substance use is associated with riskier health behaviors.[36] As marijuana legalization becomes more common, it will be important to study what happens to men as they enter a legal marijuana substance environment, provide services to support their successful reentry, and assess which services work best.

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Author Contributions

JL, AB, TM, and NF conceived and designed the experiments. JL analyzed the data. JL, NF, and AB wrote the first draft of the manuscript. TM and JD contributed to the writing of the manuscript. JL, AB, TM, NF, and JD agree with manuscript results and conclusions. JL, NF, and JD jointly developed the structure and arguments for the paper. AB and NF made critical revisions and approved final version. All authors reviewed and approved the final manuscript.

Disclosures and Ethics

The authors have read and confirmed their agreement with the ICMJE authorship and conflict of interest criteria. The authors have also confirmed that this article is unique and not under consideration or published in any other publication, and that they have permission from rights holders to reproduce any copyrighted material. The external blind peer reviewers report no conflicts of interest.

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