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What predicts incarceration among urban adults with co-occurring severe mental illness and substance use disorders?

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Abstract

Objective—People with a severe mental illness and co-occurring substance use disorder (i.e., co-occurring disorders) living in urban areas experience high rates of incarceration. This study examined socio-demographic, clinical, economic, and community integration factors as predictors of incarceration among people with co-occurring disorders.

Methods—The sample came from secondary data from a randomized controlled trial of assertive community treatment versus standard case management, in which researchers interviewed 198

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None for any author

people with co-occurring disorders from two urban mental health centers in Connecticut at baseline and every six months for three years. Researchers tracked incarceration, clinical engagement and status, employment, living situation, social relationships, and substance use. Bivariate analyses and logistic regression analyses compared individuals who were ever-incarcerated and never-incarcerated during the study period.

Results—The overall incarceration rate was 38% during the study period. In multivariate analyses, previous incarceration predicted incarceration during the study (OR = 3.26), while friendships with non-substance users (OR = 0.19), and substance use treatment engagement (OR = 0.60) were associated with reduced likelihood of incarceration.

Conclusions—Positive social relationships and engagement in treatment for substance use are promising service and policy targets to prevent incarceration in this high-risk population.

Keywords

incarceration; schizophrenia; schizoaffective disorder; substance use; co-occurring disorders; co-occurring disorders; dual diagnosis

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The U.S. has the highest incarceration rate in the world (1). People with a severe mental illness (schizophrenia spectrum disorder, bipolar disorder, or major depression) disproportionately experience criminal justice involvement (2, 3): between six and sixteen per 100 people with severe mental illness are incarcerated in a correctional facility at some point in their lifetime (4). Among people with co-occurring severe mental illness and substance use disorder, incarceration is five times more likely than among people without a co-occurring substance disorder (5). The incarceration of people with severe mental illness incurs large fiscal and resource burdens on society and often exposes these individuals to violent victimization (6, 7). Investigating the predictors of incarceration among people with severe mental illness is a critical step in developing risk assessments and preventive interventions.

Studies of risk factors among people with mental illness have generally focused on demographic correlates of incarceration (8–10). Two new analyses also suggest non-demographic risk factors predict incarceration among people with mental illness. In San Diego County, researchers linked mental health and jail records of 39,463 incarcerated and non-incarcerated individuals with mental illness (11), identifying several key risk factors for incarceration: previous incarceration, co-occurring substance use disorder, homelessness, severe mental illness, male gender, no Medicaid insurance, and race-ethnicity (African American). In Florida, researchers analyzed a Medicaid claims dataset of filled prescriptions and treatments among a group of 4,056 outpatients with schizophrenia or bipolar disorder following hospital discharge (12). They found that medication possession and use of outpatient services were associated with reductions in the likelihood of arrest. Together, these findings suggest that functional outcomes (housing) and treatment receipt (use of outpatient services and medication) may exert an effect on incarceration. Long-term cohort data from people with co-occurring disorders support these findings, consistently showing strong associations among functional improvements, extent of treatment engagement, and reductions in substance use, when controlling for demographic factors (13–17). Although

half of people with severe mental illness also experience diagnosable co-occurring substance abuse or dependence in their lifetime (18), no study has previously examined demographic or clinical correlates of incarceration in this high-risk group.

Using secondary data from a randomized controlled trial conducted in diverse urban settings, we examined demographic, clinical, and social factors as predictors of incarceration over three years. Based on previous work, our hypotheses were that previous incarceration, male gender, minority background, having a psychotic disorder, and homelessness would increase the risk of future incarceration; and engagement in treatment for substance use, employment, and positive social supports would decrease risk of future incarceration.

Methods

Participants

The parent study was a randomized controlled trial that compared assertive community treatment to standard clinical case management among 198 people with co-occurring mental health and substance use disorders from two urban areas (19). All participants met the following inclusion criteria: major psychotic disorder (schizophrenia, schizoaffective disorder, bipolar disorder, or major depression with psychotic features); active substance use disorder (abuse or dependence of alcohol or other drugs within the past six months); high service use in the past two years (two or more of the following: psychiatric hospitalizations, stays in a psychiatric crisis or respite program, emergency department visits, or incarcerations); homelessness or unstable housing; poor independent living skills; without pending legal charges, life-threatening medical conditions, or mental retardation; scheduled for discharge to community living if currently staying in an inpatient facility; and willing to provide written informed consent. Participants were all newly admitted to an outpatient treatment facility.

Parent study procedures

Participants enrolled between August 1993 and July 1998. Clinical researchers gathered information at baseline and every six months for the next three years using a standardized interview conducted by trained interviewers, along with clinician ratings of substance use disorder severity. Participants received $15 for each interview and $5 for urine and saliva screening. The institutional review boards of the Connecticut Department of Mental Health and Addiction Services, the Southwest Connecticut Mental Health System, Dartmouth College, and the University of Connecticut approved the protocol. The original publication of findings compared case management types and described the natural course of illness (19). Both models incorporated integrated treatment for mental health and substance use disorders.

Measures

Clinical Factors—Clinical interviewers established participants' psychiatric diagnosis and substance use disorders using the Structured Clinical Interview for DSM-III-R (20). To supplement the substance use assessments, clinicians (case managers) rated participants every 6 months on three standardized rating scales: the Alcohol Use Scale (AUS) (21), the

Drug Use Scale (DUS), and the Substance Abuse Treatment Scale (SATS) (22). The AUS and DUS identify disorder severity on a five-point scale based on DSM-III-R criteria: 1 = abstinence, 2 = use without impairment, 3 = abuse, 4 = dependence, and 5 = severe dependence. Drug or alcohol use ratings indicating “abstinence” or “use without impairment” indicated participants in control of their alcohol or drug use. The SATS indicates progressive involvement in treatment and movement toward long-term remission from a substance use disorder according to the (24) model of treatment and recovery on an eight-point scale: 1–2 indicates early and late stages of engagement in treatment (the individual still meets criteria for substance use or dependence); 3–8 indicate that the person is engaged in treatment at various stages in addressing their substance use, with 3– 4 indicating stages of persuasion, 5– 6 indicating stages of active treatment, and 7– 8 indicating stages of relapse prevention and recovery. Attaining the late active treatment stage or better (≥6) signifies that the individual has attained a clinically meaningful remission and demonstrated that he or she is actively working on or has attained long-term abstinence.

Community Integration Factors—These factors included housing, social support, and employment. Residential status was assessed using a residential timeline follow-back calendar, where participants were asked to report where they had been living and for how long (including institutionalization) (24). We considered participants as having been homeless if they experienced at least one day of sheltered homelessness (e.g., slept at a shelter or at a friend’s house) or literal homelessness (e.g., lived on the street) any time prior to incarceration during the study period. Researchers used an item from the Quality of Life Interview (Lehman, 1988) to assess social relations. We recoded the item such that participants who reported at least one non-substance-using close friend who did not live with the participant and was not part of treatment staff in at least one interview prior to incarceration were rated as recipients of positive social support. We dichotomized employment status during the study as at least one day of competitive employment during the study versus none during the study.

Outcome—The dataset contained self-reported days of incarceration collected retrospectively every six months during the three years of follow-up and incarceration data (admission and discharge dates) from the Department of Corrections. The primary outcome variable was whether an individual experienced one or more days of incarceration during the three years of follow-up (hereafter, “ever-incarcerated” and “never-incarcerated”). We assumed that the participant had been incarcerated if either source indicated an incarceration.

Statistical analysis

Descriptive statistics characterized the overall sample. To compare ever-incarcerated to never-incarcerated participants, we conducted chi-square tests for dichotomous and categorical predictors and t-tests for the continuous predictor (age).

Many clinical and social variables were based on the participants’ status during the study. To prepare for predictive modeling, the following variables relevant to the prediction of

incarceration were recoded (dichotomized) to reflect their presence or absence prior to incarceration: alcohol use disorder, drug use disorder, cocaine use, social contact with non-user, competitive employment, and homelessness. We used an algorithm to exclude measurement following incarceration during the study. For example, if participants were incarcerated in year 2 of follow-up and spent one or more days homeless before the incarceration event, they were considered 'homeless' in the statistical analysis. If participants were incarcerated in year 2 of follow-up and did not spend one or more days homeless until afterwards (e.g., year 3), they were considered 'not homeless.' Similarly, the SATS score received in the interview prior to incarceration was used in the analysis for incarcerated participants. For never-incarcerated participants, we used their 18-month follow-up SATS score (mean time before incarceration was 17 months). For all variables other than SATS score, for never-incarcerated participants, we used all available follow-up data to determine the value of each predictor variable.

We generated a correlation matrix to identify potential multicollinearity between the variables measuring substance use. Substance Abuse Treatment Scale, Drug Use Scale, Alcohol Use Scale and cocaine use were all strongly correlated. Therefore, we only included the Substance Abuse Treatment Scale, the most comprehensive description of substance use, in the regression models.

Next, we computed two multivariate logistic regression analyses that compared participants who were incarcerated at any time during the three-year study to participants who had not been incarcerated. For the first model, measures from previous research found predictive of incarceration were included. For the second model, we retained predictors that related to incarceration at the $p < .25$ level in model 1 and added two social predictors, employment and social support. We conducted all analyses using IBM SPSS Statistics version 19 (25).

Results

Baseline Characteristics

Table 1 displays the baseline characteristics of the 198 participants, who tended to be African-American, male, unmarried, and poorly educated. Schizophrenia and schizoaffective disorder were more common than other diagnoses. Participants most frequently reported abusing alcohol and crack/cocaine. Some of these descriptive findings were published in an earlier report (19).

Over three years 75 (38%) of the participants were incarcerated. Table 2 shows the bivariate relationships between incarceration and hypothesized predictors. Other significant risk factors for incarceration included previous incarceration history, young age, drug use disorder and one or more days homeless. Protective factors for incarceration included having a drug- and alcohol-free close friend and a higher SATS score (indicating limited or no substance use).

Among participants incarcerated during the study, the average SATS score was 2.79 (SD = 1.91) in the month preceding incarceration, indicating that these individuals were engaged in treatment but still met criteria for substance abuse or dependence. By comparison, those who

were never incarcerated had a comparative SATS average of 4.29 (SD = 1.30), indicating that they were engaged in treatment and showed evidence of reduction in use for at least the past one month (fewer substances, smaller quantities, or both).

Table 3 shows the results of the final logistic regression model. Previous incarceration strongly predicted incarceration during the study, tripling the likelihood of incarceration. Having a drug- and alcohol-free close friend was associated with a reduced likelihood of incarceration of approximately three quarters, and having a higher SATS score decreased the likelihood of incarceration by half. Age, race, gender, employment, and one or more days of homelessness did not significantly predict incarceration in the final model. Incorporating employment and positive social support significantly improved the overall predictive model for incarceration improvement over an initial model that excluded these predictors (p-value for chi-square test comparing the −2 Log Likelihood of model 1 and model 2 < 0.001). See Supplement for initial model results. In two sensitivity analyses, we confirmed that experimental condition did not predict incarceration status during the study by adding an indicator for ACT versus standard case management to the final model; removing previous incarceration from the final model did not interpretively change the results, except that homelessness predicted incarceration during the study (results not shown, available upon request).

Discussion

Over one-third of the study group with co-occurring disorders was incarcerated over the three-year period. In multivariate analyses, previous incarceration, lacking positive social support, and lack of engagement in substance use treatment predicted incarceration. Bivariate, but not multivariate analyses, supported other hypothesized relationships, perhaps because some variables shared variance (e.g., minority status and previous incarceration). In bivariate analyses, participants who were younger, African American, previously incarcerated, abusing or dependent on drugs, homeless, at an early stage of substance use treatment, and lacking positive social supports were more likely to be incarcerated.

The higher rate of incarceration among participants who had previously been incarcerated is consistent with previous research (11, 12, 26), as is the increased incarceration rate for African Americans (27); however, proportionally fewer African Americans in this sample were incarcerated compared to national rates (27). Close surveillance and difficulty reinstating Medicaid benefits following discharge may intensify risk of repeated criminal justice involvement (28–33). High rates of re-imprisonment in this population have also been linked to inadequate treatment provided in jails and prisons (34), but we could not examine this possibility.

Engaging in substance use treatment as well as attaining abstinence distinguished never-incarcerated and ever-incarcerated participants in the current study (Table 2). Substance use itself is often conceptualized as the immediate precipitant of incarceration (8, 11), not lack of treatment engagement. The only other study that examined the relationship between treatment engagement and incarceration also found a significant protective effect (12). Our study provides a complement to these results by controlling for substance use remission

status. Treatment-seeking behavior may indicate a willingness to make significant changes to one's social life and living situation. Programs that incorporate stages of treatment corresponding to client needs can facilitate those changes. For example, providing structured housing in a safe community away from disruptive peers may prevent contacts with the police (35).

We extend previous research by emphasizing potentially modifiable measures (social network, employment and housing) that might inform both treatment and prevention efforts (5, 26). Individuals with co-occurring disorders often are socially disadvantaged by cognitive and emotional difficulties and can be drawn into social groups that deviate from social norms in dangerous ways and engage in illegal acts (36, 37). Drug- and alcohol-free close friends may facilitate recovery by keeping people with co-occurring disorders away from individuals and environments that trigger the desire for drugs or otherwise enhance their likelihood of use, enabling them to spend time learning a skill or working (37). Other studies have demonstrated the chronological order of friendship and improvements in other life domains (14). Employment status, was unrelated to incarceration, but rates of employment may have been too low to discern a relationship. Prior homelessness did not predict incarceration, except when prior incarceration was removed, an indication that the typical client experienced both incarceration and homelessness in the past, or neither experience. Earlier research found strong associations between homelessness, co-occurring drug use disorder, and incarceration (5, 8, 11, 35, 38), in keeping with this finding.

Several limitations deserve mention. Although this is one of the first longitudinal observational studies of incarceration among people with co-occurring disorders, generalizability is limited to individuals receiving treatment in highly urbanized environments. Since the sample was patients receiving treatment, the hypothesis that insurance status moderates treatment receipt, which in turn influences incarceration rates, could not be tested. The never-incarcerated individuals had a greater opportunity to be homeless, achieve friendship or employment, and engage in treatment (e.g., more time in the community to be homeless) than the individuals who had been incarcerated at some time in the study. Other variables may not have been predictive due to a lack of variation in the sample. Also, in our analyses, we included a measure of treatment engagement that was not independent from alcohol or drug use. Participants of the parent study met criteria for substance use or dependence at baseline and were newly admitted to the treatment facility, hence this scale was appropriate to track both their subsequent engagement in treatment and progress addressing substance use. However, this scale does not provide information about participants who did not ever engage in treatment who achieved substance use disorder remission. The small number of sites is a limitation of the study, as is the age of the data. The richness of the data collected did allow us to conduct analyses not possible with more recent data. Finally, this descriptive study does not permit causal interpretation.

Three important clinical implications arise from this study. First, preventing initial incarceration should be a primary goal because incarceration predicts more incarceration. Second, promoting outreach and engagement with treatment for substance use through mental health courts may help to prevent induction into the incarceration-reincarceration spiral (39, 40). Third, positive social supports may prevent incarceration. Group self-help

communities, such as Alcoholics Anonymous and Double Trouble in Recovery, foster such friendships by encouraging healthy behaviors among individuals based on a shared group identity of abstinence-friendly lifestyle goals and behaviors (3030, 41–44).

Conclusions

Facilitating engagement in treatment for substance use and finding positive social supports within the community may help individuals with co-occurring mental health and substance use disorders reduce the risk of incarceration.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements

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Table 1

Baseline characteristics for 198 patients with co-occurring serious mental illness and substance use disorder

Variable	N	%
Age (mean ± SD)	36.51 ± 7.80	
Male	142	72
Race-ethnicity		
White	54	27
Hispanic	28	14
African-American	108	55
Other	7	4
Never married	145	73
Completed high school or higher	98	50
Primary diagnosis		
Schizophrenia	108	55
Schizoaffective	43	22
Bipolar	13	7
Major depression	19	10
Other mood disorder	1	1
Other psychotic disorder	12	6
Substance use disorder (abuse or dependence)		
Alcohol	130	66
Cocaine/Crack	120	61
Cannabis	74	37
Insured by Medicaid or Medicare	156	84
Psychiatric hospitalization in the past year	99	50
Any competitive employment in the past year	34	17
Ever incarcerated before study	110	56
Ever homeless before study	78	39
Experimental condition		
Assertive Community Treatment	99	50
Standard case management	99	50
Study Site		
Site 1	100	51
Site 2	98	50

Note: Table 1 is an aggregated report for the entire sample. Bivariate results by site and experimental condition were previously reported in Essock et al., 2006

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Table 2

Bivariate comparisons between ever-incarcerated and never-incarcerated participants with co-occurring disorders

	Not incarcerated during the study period		Incarcerated during the study period				
Total	**N=123**	**62.1%**	**N=75**	**37.9%**			
Baseline Variables	**N**	**%**	**N**	**%**	**X^2 or t-test**	**df**	**p-value**
Age (mean ± SD)	37.4	8.0	35.0	7.2	2.12	195	0.04
Gender					0.82	1	0.36
Male	91	74	51	68			
Female	32	26	24	32			
Race-ethnicity					13.65	3	0.003
White	42	36	12	16.7			
Hispanic	21	18	7	(10			
African-American	55	47	53	74			
Other	5	4	2	3			
Diagnosis					0.26	1	0.61
Mood disorders	22	18	11	15			
Psychotic disorders	101	82	62	85			
Prior incarceration					19.28	1	<0.001
Yes	54	45	56	78			
No	65	55	16	22			
Experimental condition					0.02	1	0.88
Assertive Community Treatment	62	50	37	49			
Standard case management	61	50	38	51			
Site					1.29	1	0.26
Site 1	66	54	34	45			
Site 2	57	46	41	55			
Variables Collected During the Study							
Alcohol use disorder					3.12	1	0.08
Yes	96	78	50	67			

	Not incarcerated during the study period		Incarcerated during the study period				
Total	**N=123**	**62.1%**	**N=75**	**37.9%**			
Baseline Variables	**N**	**%**	**N**	**%**	**X^2 or t-test**	**df**	**p-value**
No	27	22	25	33			
Drug use disorder					8.41	1	0.004
Yes	93	76	69	92			
No	30	24	6	8			
Cocaine use					5.89	1	0.02
Yes	62	50	51	68			
No	61	50	24	32			
Social contact with non-user					13.04	1	<.001
Yes	83	68	31	41			
No	40	33	44	59			
Competitive job					3.48	1	0.06
Yes	47	38	19	25			
No	76	62	56	75			
Homeless					6.38	1	0.01
Yes	56	46	48	64			
No	67	56	27	36			
Substance Abuse Treatment Scale					33.64	7	<.001
Pre-engagement	2	2	5	7			
Engagement	17	16	27	39			
Early persuasion	31	29	28	40			
Late persuasion	16	15	6	9			
Early active treatment	12	11	0	0			
Late active treatment	7	7	1	1			
Relapse prevention	18	17	2	3			
In remission or recovery	5	5	1	1			

Table 3

Logistic regression model predicting incarceration over the course of three-year follow-up

Variable	OR	95% CI	p-value
Age (years)	0.96	0.91 – 1.02	0.15
Gender (reference: female)	0.98	0.37 – 2.59	0.97
Race/Ethnicity (reference: white)			
Hispanic	1.67	0.61 – 4.59	0.32
African American	0.81	0.20 – 3.22	0.76
Other	0.08	0.01 – 1.30	0.08
Psychotic Disorder (reference: mood disorder)	0.97	0.31 – 3.09	0.96
Prior Incarceration (reference: none)	3.26	1.38 – 7.71	0.007
Homeless (reference: none)	2.21	0.99 – 4.93	0.06
Substance Abuse Treatment Scale	0.60	0.45 – 0.79	<.001
Employment (reference: none)	0.77	0.32 – 1.89	0.57
Social contact with non-user (reference: none)	0.19	0.08 – 0.43	<.001

For initial model without employment or social contact: N = 170, −2 Log Likelihood = 172.704

For final model with employment and social contact included: N = 170, −2 Log Likelihood = 154.709 Change in model fit: X^2 = 17.995, df = 2, p < .001