

Examining Criminogenic Risk Levels Among People with Mental Illness Incarcerated in US Jails and Prisons

Amy Blank Wilson, PhD, LSW

Karen J. Ishler, PhD, LSW

Robert Morgan, PhD

Jonathan Phillips, MSW

Jeff Draine, PhD, MSW

Kathleen J. Farkas, PhD, LISW

Abstract

This study examines criminogenic risk levels of individuals with serious mental illness (SMI) involved in the justice system compared to justice-involved individuals without mental illness. The sample (N = 436) consisted of ninety-three individuals with SMI incarcerated in a county jail in a mid-size Midwest city, 217 individuals with SMI incarcerated in a state prison in the US Northeast, and 126 individuals without mental illness incarcerated in a state prison in the US Southwest. Results indicated that people with SMI incarcerated in jail and prison had higher overall criminal risk levels than prison inmates without mental illness. Results further demonstrated that, on average, higher percentages of persons with SMI had high/very high criminogenic risk scores. Finally, we noted that persons with SMI scored higher on most of the eight criminogenic risk domains measured by the Level of Service Inventory. These findings are possibly the most compelling to date in the growing body of literature demonstrating that justice-involved people

Address correspondence to Amy Blank Wilson, PhD, LSW, School of Social Work, University of North Carolina at Chapel Hill, 325 Pittsboro St. Campus Box 3550, Chapel Hill, NC 27599-3550, USA.

Jonathan Phillips, MSW, School of Social Work, University of North Carolina at Chapel Hill, Campus Box 3550, Chapel Hill, NC, USA.

Karen J. Ishler, PhD, LSW, Jack, Joseph and Morton Mandel School of Applied Social Sciences, Case Western Reserve University, Cleveland, OH, USA.

Kathleen J. Farkas, PhD, LISW, Jack, Joseph and Morton Mandel School of Applied Social Sciences, Case Western Reserve University, Cleveland, OH, USA.

Robert Morgan, PhD, Department of Psychological Sciences, Texas Tech University, PO Box 42051, Lubbock, TX, USA.

Jeff Draine, PhD, MSW, School of Social Work, College of Public Health Sciences, Temple University, Philadelphia, PA, USA.

with SMI have elevated criminogenic risk comparable to or greater than their non-mentally ill peers involved in the justice system. Consequently, treatment programs and interventions for justice-involved individuals with SMI need to explicitly target criminogenic needs into treatment efforts.

Introduction

Arrest and incarceration are a pervasive reality for people with serious mental illnesses (SMI).¹⁻⁴ Research has consistently demonstrated that people with serious mental illness are substantially overrepresented in the criminal justice system.¹⁻⁵ Estimates of the prevalence of people with mental illness in jails and prison vary based on study methodology, setting, and definition of mental illness.² However, even studies that have used the most conservative and empirically defensible measures have found that 6 to 31.0% of people in jails and 6 to 14% of people in prison have a serious mental illness.²⁻⁵ Once involved with the criminal justice system, people with SMI recidivate more often and more quickly than individuals without mental illnesses, prolonging their involvement in the criminal justice system.⁶⁻¹²

The protracted involvement of people with SMI in the criminal justice system is caused, at least in part, by the fact that even within the context of research studies where treatment availability is ensured as part of the research design, existing evidence-based interventions have not been able to achieve a sustained and consistent positive impact on criminal recidivism within this population.¹³⁻¹⁶ The potential implications of this situation are illustrated by the fact that the evidence-based interventions for people with SMI involved in the justice system that focus primarily on treatment targets associated with traditional mental health treatment services (i.e., mental health symptomatology) have the weakest effect on criminal recidivism among people with SMI.¹⁵

The inability of mental health interventions to achieve a sustained positive impact on criminal recidivism among people with SMI has prompted discussions about what additional evidence-based interventions need to be added to the array of treatment services available to justice-involved people with SMI in order to reduce criminal justice recidivism among this population. One potential answer is to include interventions that explicitly target the risk factors most closely associated with criminal offending into the array of treatment services available to justice-involved people with SMI.^{11,13,15,17-22}

A growing body of research supports the need to expand available interventions for justice-involved people with SMI to include interventions that explicitly target the risk factors most closely associated with criminal justice recidivism. The Risk-Need-Responsivity Model (RNR) identifies eight risk factors that have the strongest relationship to criminal recidivism.^{23,24} These risk factors are called criminogenic risk factors and include antisocial personality, antisocial behavior, antisocial cognition, antisocial associates, substance use, marital/family circumstances, employment/education, and leisure/recreation.²³

The first study to examine criminogenic risk factors among justice-involved people with SMI was a study by Bonta, Law, and Hanson which found that people with mental illness faced the same general risk factors (i.e., criminogenic risk factors) for criminal recidivism as those without mental illness; 15 years later, those study results were replicated by Bonta, Blais, and Wilson.^{25,26} In addition, recent research has found criminogenic risk factors mediate the risk of recidivism among people with SMI.²⁷ Taken together, these studies offer strong support for the idea that criminogenic risk factors play an important role in the criminal recidivism of people with SMI. However, much is yet to be learned about how criminogenic risk factors present among justice-involved people with SMI.

The research literature on justice-involved people with SMI has given substantial attention to one criminogenic risk factor, antisocial cognition, using measures of criminal thinking and

attitudes, which are thoughts and beliefs that support criminal behavior.²³ There are some differences in how these constructs are assessed across measures; however, most measures of criminal thinking assess people's thoughts and attitudes as they relate to a sense of entitlement, which refers to an individual's belief that they have a right to take what they want or need, moral detachment which assesses whether individuals justify criminal behavior by rationalizing that place the blame for their actions on outside forces, and individuals' attitudes toward violence.²⁶

Morgan and colleagues examined levels of criminal thinking among people with SMI incarcerated in prison and found that more than half the sample endorsed a thinking style supportive of a criminal lifestyle.²⁷ These findings were supported by Wolff and her colleagues who found people with SMI incarcerated in prisons displayed levels of criminal thinking either comparable to or higher than offenders without mental illness.^{21,22} Building on these studies, Wilson et al. examined the levels and types of criminal thinking among people with SMI incarcerated in jails, and compared their findings with the levels of criminal thinking reported by Morgan et al.^{11,28} Notably, Wilson et al. had two major findings: (1) people with SMI incarcerated in jail demonstrated strong patterns of criminal thinking, and (2) people with mental illness, whether incarcerated in jail or prison, displayed remarkably similar patterns of elevated criminal thinking.¹¹ To date, research on criminal thinking among justice-involved people with SMI has provided important information about one of the eight major criminogenic risk factors.

Girard and Wormith's study was one of the first to examine the levels of all eight criminogenic risk factors in a sample of offenders with mental health problems.²⁹ Girard and Wormith's results showed offenders with mental health problems in their study sample had higher overall criminogenic risk levels than offenders without mental health problems.²⁹ More recently, Skeem and colleagues examined all eight criminogenic risk factors among people with SMI (i.e., schizophrenia and/or major affective disorders) on parole, and found the overall criminogenic risk/need levels among parolees with SMI was significantly higher than those among parolees without SMI.³⁰ Skeem et al. also found in one study that parolees with SMI had significantly higher risk/need levels on four of eight criminogenic domains; antisocial personality, antisocial cognition, family/marital circumstances, and employment/education.³⁰ These findings were supported by a recent study that compared parolees with and without SMI, and found the parolees with SMI had significantly higher levels of criminogenic risk and their increased risk levels were associated with higher levels of criminal recidivism.³⁰

A first step toward developing interventions to address criminogenic risk factors among justice-involved people with SMI is to build knowledge about the types and levels of criminogenic risk present among justice-involved people with SMI in order to determine what types of interventions are best suited to address criminogenic risk factors in this population. Research in this area is especially important considering the fact that most interventions that address criminogenic risk factors among the general population of people involved in the criminal justice system target only a subset of the eight criminogenic risk factors known in the RNR model as the "Big Four" risk factors: antisocial behavior, personality, cognition, and associates.²³ According to the RNR model, the "Big Four" risk factors are the focus of intervention because when addressed successfully in treatment, these four risk factors have the strongest associated with reductions in recidivism.²³

In order for mental health services for justice-involved people with SMI to address the Big Four criminogenic risk factors, they need to expand to include new services that focus on a number of new treatment targets. For example, interventions that address the Big Four risk factors engage programming that helps individuals to develop noncriminal responses to risky situations and skills for impulse control, anger management, and problem-solving in high conflict situation.^{23,24} These interventions also teach participants the skills needed to reduce the thoughts, feelings, beliefs, and attitudes that support criminal behavior and incorporate approaches that both limit participants' contact with criminal associates and build connections with individuals supportive of prosocial behaviors.^{23,24}

Research has shown that justice-involved people with SMI have high levels of criminogenic risk levels and that these risk factors are associated with higher levels of criminal recidivism in this population.³¹ The growing recognition of the role that criminogenic risk factors play in recidivism among people with SMI has led to the development of interventions that make criminogenic risk factors the central focus of treatment for justice-involved people with SMI.^{32,33}

The RNR model provides an empirically validated approach to address criminogenic risk factors in treatment. However, before there is a wide-scale adoption of interventions derived from the RNR model for use with justice-involved people with SMI, it is important to examine both the overall levels of criminogenic risk factors among justice-involved people with SMI at different points of involvement in the criminal justice system and levels of elevation on each of the eight criminogenic risk factors. This information will help to determine where interventions that address criminogenic risk are most needed in the treatment continuum available to justice-involved people with SMI and what particular criminogenic risk factors should be the focus of intervention among justice-involved people with SMI.

This article adds to intervention research focused on the development of interventions that address criminogenic risk factors among justice-involved people with SMI by examining criminogenic risk levels among people with SMI experiencing different levels of incarceration. Specifically, this study sought to compare the overall criminogenic risk levels of three groups: people with SMI incarcerated in jails, people with SMI incarcerated in prisons, and people without SMI incarcerated in prison. Additionally, this study aimed to examine and compare levels of each of the eight criminogenic risk factors across these three groups, and to investigate the ways in which the overall and specific criminogenic risk levels vary by type of incarceration and presence of mental illness.

Methods

Design

To compare criminogenic risk levels, the current study conducted an exploratory, post hoc analysis of data ($N = 436$) drawn from three separate studies of people with SMI incarcerated in jail (Jail SMI sample, $N = 93$), people with SMI incarcerated in prison (Prison SMI sample, $N = 217$), and people without SMI incarcerated in prison (Prison sample, $N = 126$). Each of these studies used the Level of Service Inventory to assess criminogenic risk levels among their respective samples.³⁴ All research associated with the current study was approved by the Institutional Review Board at the university where the study took place.

Samples

People with SMI in jail (Jail SMI sample) The Jail SMI sample comprised 93 individuals incarcerated in a county jail who participated in a study of an enhanced reentry program for young adults with SMI.³⁵ This study took place in a mid-size city in the US Midwest. According to the study's eligibility criteria, the sample included men and women ages 18 to 24 years who were incarcerated on misdemeanor and low-level felony charges and whose post-release plans included residing in the county where the study took place. All participants had an SMI diagnosis (i.e., schizophrenia spectrum disorder, bipolar disorder, or major depression disorder).

Prisoners with SMI (Prison SMI sample) The Prison SMI sample consisted of 217 individuals incarcerated in a state prison system in the US Northeast who were recruited to participate in a study of the effectiveness of the critical time intervention model (CTI) with men.³⁶ According to the study's eligibility criteria, this sample included men 18 years and older who were scheduled to

be released within 3 months of study recruitment, and who planned to live in the study county after their release. In addition, to be included in the study, the prisoner had to have an SMI diagnosis of one of the following disorders: schizophrenia spectrum disorder, bipolar disorder, major mood disorder, anxiety disorder, or posttraumatic stress disorder.

Prisoners without SMI (Prison sample) The Prison sample included 126 men incarcerated in a state prison system in the US Southwest who were recruited to participate in a study that examined the role of dynamic risk factors as predictors of post-release criminal justice outcomes.³⁷ According to this study's eligibility criteria, this sample included individuals released to a community within 120 miles of the research team's university. Participants were interviewed during their incarceration or within 48 h of their release. Of the initial 137 individuals recruited for the initial study, 9 cases were excluded because participants reported that they had a serious mental illness (e.g., schizophrenia spectrum and/or major affective disorders). Two additional cases were excluded because there was no data on their criminogenic risk levels (i.e., no LSI-R). This yielded a final sample of 126 prisoners without mental illness.

Tables 1 and 2 provide information on the background characteristics of the three samples. Statistically significant differences were observed in a number of areas, many of which were expected based on the composition of the study samples. For example, as would be expected based on differences in study sampling criteria, the Jail SMI sample included younger participants than those in the two prison samples. The Jail SMI sample also included more women, and had higher rates of co-occurring substance use disorders. Comparisons of the three groups also found that a greater percentage of participants in the Prison sample (without SMI) identified as Hispanic. Comparisons of the two groups with mental illness (i.e., Jail SMI and Prison SMI samples) also found several statistically significant differences, many of which would be expected based on between-group differences in age and level of involvement with the criminal justice system. For example, as compared with the Prison SMI sample, the Jail SMI sample included participants who were younger when they had their first contact with the criminal justice system; however, participants in the Prison SMI sample had more prior arrests than those in the Jail SMI sample.

Measures

All three studies from which we drew data used a version of the Level of Service Inventory (LSI) to assess criminogenic risk levels in their respective samples. Since the LSI was developed by Andrews in 1982, researchers have introduced several versions and revisions, including the Level of Service Inventory-Revised (LSI-R) and the Level of Service/Case Management Inventory (LS/CMI).^{34,38,39} The studies from which we drew data for the Prison SMI sample and the Prison sample used the LSI-R, and the study from which we drew the Jail SMI sample used the LS/CMI. In each of the three studies, a member of the research team completed the LSI as part of the baseline assessment, using the structured questionnaire associated the measure. All baseline interviews with the Jail SMI and Prison SMI samples were completed while individuals were incarcerated, whereas the baseline interviews with the Prison sample were completed while participants were incarcerated or within 48 h of their release from incarceration.

Given that the LS/CMI is the more recent instrument, the developers have recommended that researchers and clinicians convert existing LSI-R scores into LS/CMI scores.³⁹ The relative equivalence of the two measures has been demonstrated in numerous studies, including those using simultaneous, comparative scoring and those using the LSI-R-to-LS/CMI score conversion rules.^{34,38,39} We converted the LSI-R scores to LS/CMI scores for our Prison SMI sample and Prison sample using syntax provided by the LS/CMI publisher (Williams K, Multi-Health Systems, personal communication January 2014).

Table 1

Demographic characteristics for the three study samples

	Prison sample (N = 126)		Jail SMI sample (N = 93)		Prison SMI sample (N = 217)		Significant differences ¹
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Age							Mean age: P, PM > J
<i>M</i> (<i>SD</i>)	34.7	(10.6)	21.6	(1.8)	36.6	(9.7)	
Age range	18–62		18–24		19–60		
Gender							% female: J > P, PM
Male	126	100	76	81.7	217	100	
Female	0	0	17	18.3	0	0.0	
Race/ethnicity							% Hispanic: P > J, PM% other/unk: J, PM > P
Black	45	35.7	40	43.0	94	43.3	
White	25	19.8	31	33.3	70	32.3	
Hispanic	55	43.7	5	5.4	32	14.7	
Other or unknown ²	1	0.8	17	18.3	21	9.7	
Education							% less than HS/GED: J > PM % HS/GED: PM > J
Less than HS diploma/GED	–	–	59	63.4	89	41.0	
HS diploma/GED	–	–	19	20.4	85	39.2	
Any post-secondary school	–	–	15	16.2	43	19.8	
Marital status							Not done
Single, never married	–	–	62	66.7	163	75.1	
Married	–	–	1	1.0	11	5.1	
Living with partner	–	–	26	28.0			
Other or unknown ³	–	–	4	4.3	43	19.8	
Ever employed ⁴							% ever employed: PM > J
No	–	–	23	24.7	16	7.4	
Yes	–	–	70	75.3	201	92.2	

– = data not available for this sample. *HS* high school, *GED* General Equivalency Diploma. In the last column, significant differences are noted using the first letter of each study sample—P (Prison sample), J (Jail SMI sample), PM (Prison SMI sample)

¹Differences were significant at $p < 0.05$

²Other includes multi-racial individuals (i.e., those who reported more than one race)

³Other includes those who were divorced, separated, or widowed. Because of lack of comparable categories used across samples, no tests of significance were performed for marital status data

⁴Indicates whether a person has been employed at least one time in their lifetime

The 43-item LS/CMI measures risk for criminal justice recidivism using the criminogenic risk factors developed by the RNR model. This measure assesses an individual's overall risk level and their risk level within the eight criminogenic risk domains included in the measure.⁴⁰ These criminogenic domains include leisure/recreation, antisocial associates, drug/alcohol problem,

Table 2

Criminal justice and behavioral health characteristics of the three study samples

	Prison sample (N = 126)		Jail SMI sample (N=93)		Prison SMI sample (N= 217)		Significant differences ¹
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Criminal justice history							
Number of prior arrests ²							PM > J
<i>M</i> (<i>SD</i>)	–	–	9.7	(13.8)	17.3	(15.4)	
<i>Mdn</i>	–	–	6.0		13.0		
Age at first arrest ³							PM > J
<i>M</i> (<i>SD</i>)	–	–	15.2	(3.2)	17.8	(7.5)	
<i>Mdn</i>	–	–	15.0		16.0		
Behavioral health diagnoses							
Bipolar	na	na	59	63.4	130	59.9	
Psychotic	na	na	31	33.3	73	33.6	
Mood with psychotic features	na	na	21	22.6	63	29.0	
Major depression	na	na	73	78.5	135	62.2	J > PM
Anxiety ⁴	na	na	57	61.3	157	72.4	PM > J
PTSD (current)	na	na	25	26.9	70	32.3	
Co-occurring DOA disorder	na ⁵	na ⁵	92	98.9	141	65.0	J > PM

– = variable not available for this sample. *na* variable not applicable for this sample, *PTSD* posttraumatic stress disorder, *DOA* drug and/or alcohol use disorder. In the last column, significant differences are noted using the first letter of each study sample—P (Prison sample), J (Jail SMI sample), PM (Prison SMI sample)

¹Differences were significant at $p < 0.05$

²Prior arrest data based on inmate/parolee self-report. Due to missing data, $N = 89$ for Restore sample and $N = 143$ for CTI sample

³Age at first arrest data based on inmate/parolee self-report. $N = 147$ for CTI sample because of missing data

⁴Includes generalized anxiety disorder and panic disorder

⁵People in the Prison sample (P) where NOT excluded based on the presence substance use diagnoses; rather, this information was not available for people in this sample

antisocial cognition, antisocial personality pattern, antisocial behavior, education/employment, and family/marital relations. Items within each criminogenic domain are summed to create a domain score, and then each domain score is categorized on a 5-point scale of risk levels: *very low* (0), *low* (1), *medium* (2), *high* (3), or *very high* (4). Additionally, all LS/CMI items are summed to yield an overall risk for recidivism score categorized using the same five risk levels.⁴¹

The LSI is one of the most frequently used and most-reviewed correctional assessment instruments.⁴¹ The instrument has been validated across a variety of correctional settings and offender populations in North America and in the UK.^{42–46} LSI measures have demonstrated acceptable internal consistency, test-retest, and alternate forms reliability. Studies have found LSI scores to be predictive of an array of relevant correction outcomes, including recidivism, self-reported offending, institutional misconduct, and probation and parole outcomes.³⁹ (See Chapter 4 in Andrews et al. for a summary of more than three decades of research attesting to the reliability and validity of the LSI.)⁴⁰

The Jail SMI sample and Prison SMI samples used the Mini International Neuropsychiatric Interview (M.I.N.I.) to assess the presence of SMI.⁴⁷ The M.I.N.I. is a short, structured diagnostic

interview developed and standardized based on the Composite International Diagnostic Interview (CIDI) and informed by the *Diagnostic and Statistical Manual of Mental Disorders* and the International Classification of Diseases.^{48,49} The M.I.N.I. takes about 15 min to complete, and researchers have used the M.I.N.I. in correctional settings.⁵⁰ Studies have shown the M.I.N.I. had acceptable inter-rater and test-retest reliabilities, and that the validity of the M.I.N.I. compared favorably with other structured diagnostic interviews.⁴⁷

Procedures

For each of the samples included in the current study, we compared descriptive data related to demographic, criminal justice, and behavioral health characteristics. Given the post hoc nature of this study, all analyses presented here used aggregated data from each study. Consequently, some information was not available for all samples or data were not measured or summarized in comparable ways across studies. Where necessary and feasible, we recoded variables such as race/ethnicity and marital status to ensure the equivalence of comparisons across samples. In addition to descriptive statistics, we also obtained or calculated summary frequency counts and percentages for each sample.

Each study provided aggregate data for the eight criminogenic risk domains as well as overall criminogenic risk level. Using the data obtained for each sample, we computed two summary measures for each criminogenic domain and the overall criminogenic risk level:

- 1 Mean risk score, which was based on the 5-point scale of risk levels (*very low* = 0 to *very high* = 4)
- 2 Percentage of individuals who scored at the *high* or *very high* risk levels

Statistical analyses

Where equivalent data existed, the three samples were compared to determine if the groups differed significantly in terms of background characteristics (e.g., demographic, criminal justice, and behavioral health variables) or levels of criminogenic risk. Comparisons were made using either parametric or nonparametric statistical techniques, depending on the characteristic of interest.

For continuous variables (i.e., age, risk scores), mean values were compared across samples using one-way ANOVA or Welch's ANOVA (i.e., a nonparametric version that adjusts for unequal variances, especially in the presence of disparate sample sizes). If an omnibus ANOVA was significant, post hoc testing was completed to identify which pairs of samples were different. To ensure that the family-wise error rate did not exceed 0.05, *p* values were adjusted using a Bonferroni method or Games-Howell tests were used to adjust for unequal variances and unequal sample sizes.

For categorical variables (e.g., race/ethnicity, percentage at *high* or *very high* risk), chi-square tests were used to compare the percentages/proportions of each sample across the different categories. If an omnibus chi-square test was significant, post hoc testing was done to identify specific differences. A Marascuilo procedure was used to maintain a family-wise error rate of 0.05.⁵¹

Results

Table 3 displays the results of the comparison of criminogenic risk levels for the three samples. The descriptive data in this table present the mean risk score and the percentage of individuals in each sample who scored *high* or *very high* on the overall criminogenic risk scale and the eight specific domains of criminogenic risk factors measured by the LSI. Statistically significant

between-group differences in the mean risk score (next to last column) and the percentage of individuals who scored *high* or *very high* in each domain area (last column) are also presented.

As shown in the last row of Table 3, incarcerated individuals with SMI (i.e., Jail SMI and Prison SMI samples) had higher overall criminogenic risk levels than prison inmates without an SMI (i.e., Prison sample). In addition, in terms of both overall risk score and percentage of individuals who displayed *high* or *very high* overall levels of risk, individuals with SMI in jail had the highest overall criminogenic risk. Additionally, Table 3 shows that individuals with SMI had the highest risk scores and the greatest percentages of individuals with *high/very high* risk scores in all eight domains. Moreover, the Jail SMI sample participants had the highest risk scores and the largest percentage of individuals scoring at *high/very high* risk on six of eight domains of criminogenic risk: leisure/recreation, antisocial associates, drug and alcohol problem, antisocial cognition, education/employment, and family/marital relations. The Prison SMI sample had the highest risk scores and greatest percentage of individuals with *high/very high* risk scores for the remaining two domains of antisocial personality pattern, and antisocial behavior.

Discussion

Study findings indicate that more than 75% of individuals with SMI in this study had overall criminogenic risk levels that put them at *high* or *very high* risk for criminal recidivism. This finding adds to the growing body of literature that supports the need to include interventions that address criminogenic risk factors in the continuum of services available to justice-involved people with SMI. Further, our comparison of the criminogenic risk factors among prisoners with SMI and prisoners without SMI demonstrated that individuals *without* SMI in prison had lower levels of risk factors in almost every domain; this finding supports the notion that a synergistic relationship may exist between SMI and criminogenic risk factors.

The research presented here also provides details about the specific types of criminogenic risk factors that are elevated among people with SMI. Our examination of specific criminogenic risk factors underscores potential differences in the types of criminogenic risk factors found in people with SMI at different levels of incarceration. While this research is preliminary in nature, a number of treatment considerations arise from the results of this study that require exploration in future research.

For example, results of this research found that people with SMI in jail had the highest risk scores on six of eight criminogenic risk factors, but only two of these risk factors (antisocial cognition and antisocial associates) corresponded to the Big Four criminogenic risk factors targeted in most correctional rehabilitation programming. In the RNR model, antisocial cognitions and antisocial associates are considered two of the most important treatment targets in correctional programming because these risk factors play an important role in both criminal behavior and the antisocial attitudes and beliefs that supports it.²³ Therefore, more research is needed to explore these findings, which suggest that correctional programs that specifically target antisocial cognitions and criminal associates could have a major positive effect on recidivism and future criminal justice involvement of people with SMI incarcerated in jail.

Similar to the finding of Skeem et al., both of the SMI groups in this study displayed high criminogenic risk levels in the leisure/recreation domain.³⁰ These findings suggest that future research should examine ways to engage this treatment target in justice-involved people with SMI. Another potentially important to this study's finding stems from fact that employment and education were one of the highest criminogenic risk domains for both SMI groups in this study. Taken together, these findings suggest that future research should investigate whether the effectiveness of interventions designed to address criminogenic risk factors among justice-involved people with SMI might be enhanced by including services that focus on the ways in which individuals spend their time. These results also suggest that evidence-based practices such as

Table 3

Comparison of the three samples: mean level of risk and percent scoring at high or very high risk on level of service/case management inventory domain subscales and total score

Specific criminogenic risk factors	Prison sample N = 126		Jail SMI sample N = 93		Prison SMI sample N = 217		High/very high risk	Risk score	M	SD	%	High/very high risk	Risk score	M	SD	%	Significant mean differences ¹	Significant percent differences ¹
	risk score	High/very high risk	Risk score	High/very high risk	Risk score	High/very high risk												
Leisure/recreation	2.14	1.09	49	2.48	0.92	68	1.56	1.15	21	J > PM > P	J > P > PM							
Antisocial associates	2.06	1.49	37	3.15	1.02	74	2.20	1.10	33	J > PM, P	J > PM, P							
Alcohol/drug problem	2.13	1.15	44	3.23	0.93	84	2.41	1.24	57	J > PM, P	J > PM, P							
Antisocial cognition	1.04	1.22	14	1.48	1.42	23	1.12	1.08	10	J > P	J > PM							
Antisocial personality pattern	1.10	0.96	10	2.16	1.22	39	2.41	1.08	48	PM, J > P	PM, J > P							
Antisocial behavior	2.02	0.85	30	1.69	1.15	28	2.50	0.82	55	PM > P, J	PM > P, J							
Education/employment	1.70	1.20	25	3.03	1.00	74	2.14	1.01	38	J > PM > P	J > PM > P							
Family/marital relations	1.38	0.88	11	2.41	1.37	55	2.07	1.17	38	J, PM > P	J > PM > P							
Overall criminogenic risk level	2.42	0.76	47	3.24	0.73	87	2.88	0.65	76	J > PM > P	J, PM > P							

LS/CMI risk levels: very low (0), low (1), medium (2), high (3), or very high (4). The highest possible risk level on lack of leisure/recreation domain subscale is high (3), due to the small number of items comprising that subscale. In the last two columns, significant differences are noted using the first letter of each study sample—P (Prison sample), J (Jail SMI sample), PM (Prison SMI sample)

¹Differences were significant at $p < 0.05$

supported employment could have a positive impact on recidivism for justice-involved people with SMI if included in the array of treatment services available to people with mental illness after release from incarceration.⁵²

Another notable finding for this study is that both SMI groups had the highest risk score and percent of cases with high or very high risk scores on the substance use subscale. When the patterns of the study samples' scores on the substance use subscale are compared with their scoring patterns in the other 7 subscales, we see that they are very similar. This suggests that the samples' scores on the substance use scales are not driving the differences in overall criminogenic risk scores found between the three groups in this analysis. That said, these findings add to research that has found high rates of substance use problems among justice-involved people with SMI and lends further support to the need to provide services that address people with SMI's drug and alcohol problems during and after incarceration.^{10-12,53}

This research also found some differences in the criminogenic risk profiles for people with SMI in prison as compared with those in jail. These differences might be expected based on the longer criminal histories of those in prison. For example, people with SMI in prison had higher risk levels on the antisocial behavior subscale of the LSI, which could be accounted for by the differences in age and level of incarceration between those with SMI in prison and those with SMI in jail. It is also possible that since persons with SMI have more frequent contact with law enforcement, they are more susceptible to arrest than their peers without SMI and that this situation results in higher LSI scores for the antisocial behavior subscale in this population generally.^{54,55} Prison inmates with SMI also had higher risk scores in the antisocial personality pattern subscale. When taken together, this pattern of elevated risk suggests that something more than age or time-at-risk for involvement in the criminal justice system is driving these differences in criminogenic risk profiles for people with SMI incarcerated in either jails or prisons. This possibility is supported by the association found between the two criminogenic risks of antisocial behavior and antisocial personality with characteristics (i.e., criminogenic needs) such as irritability, thrill seeking, anger, emotional callousness, and aggression.²³ Although these two risk factors are also a target of most correctional interventions, the criminogenic needs associated with these risk factors are often considered to be deeply ingrained response patterns, which are not easily addressed in brief treatment programs, and, therefore, can take longer to remediate. Therefore, treatment aimed at these risk factors is likely to take longer and will require greater intensity of treatment than the typical 12-week cognitive-behavioral therapy interventions commonly used in correctional rehabilitation programs.

Collectively, the findings in this study support the need for further research on the criminogenic risk profiles of people with SMI involved in the justice system. In this study, individuals with SMI in jail had the highest overall criminogenic risk levels. The criminogenic risk profile of this population suggests that their criminogenic needs might differ substantially from those of individuals with SMI incarcerated in prison. For example, three of the four LSI subscales on which people with SMI in jail had the highest risk levels (i.e., leisure/recreation, substances use, and education/employment) are not associated with the Big Four criminogenic risk factors targeted in most correctional rehabilitation programming. Notably, these risk factors are not associated with emotional dysregulation or impulse control issues that are treatment targets in traditional anger management programs and other emerging interventions for justice-involved people with SMI.⁴⁹ These findings support the need for reentry programming tailored to the unique needs of young people with SMI in jail. Conversely, two of the four LSI subscales on which people with SMI in prison had the highest risk levels (i.e., antisocial personality patterns and antisocial behavior) are associated with the Big Four criminogenic risk factors targeted in most correctional rehabilitation programming. These findings support further research on the use of these programs with people with SMI in prison.

Limitations

The findings presented here come from an exploratory study that was designed to generate a preliminary understanding of an understudied area. Therefore, the findings are tempered by some notable limitations. The findings are drawn from a post hoc analysis of aggregate data from three separate studies. The aggregated nature of the data did not allow for the inclusion of individual level statistical controls for potentially confounding variables in this analysis. Although the data from these studies provided an opportunity to examine an important research question, the comparisons presented in this paper were not planned when each of the studies were conceived and designed; thus, the studies used different design, sampling criteria, and data collection protocols. The post hoc nature of this analysis means that the methods for determining mental health diagnoses and diagnostic criteria differed between studies and some questions, such as inter-rater reliability on the LSI across studies, cannot be assessed. The data collection protocols for each study ensured that staff were trained in the use of the LSI version being used in the study, as well as trained in use of the structured interview guides provided by the instrument developer to administer the measure; however, the specific rates of inter-rater reliability cannot be assessed with available data. Also the key study measure (LSI) was administered at different points in time during participants' incarceration. Therefore, further research is needed before firm comparative conclusions can be drawn on the differences in criminogenic risk levels among justice-involved people with SMI.

The studies from which this research drew data had modest sample sizes. The data from these studies were drawn from individuals incarcerated at different levels and in different geographic regions of the country. The inclusion of prisoners without a mental illness allowed for the comparison of the criminogenic risk levels of people with SMI with a group that has extensive involvement in the criminal justice system. However, further research is needed before firm conclusions can be drawn about the nature of differences in criminogenic risk levels found in this study.

Also, given the research on the age-crime curve, it is likely that the younger age of people in the jail sample played a role in this study's findings regarding criminogenic risk levels of individuals with SMI in jails.^{56,57} In order to identify people with SMI most in need of interventions that address criminogenic risk factors, it is important that future research in this area examine the role that age plays in the measure of criminogenic risk levels in this population. Given the high levels of criminogenic risk levels found among people with SMI in jail, it is also important that future research in this area include comparisons with individuals without a mental illness who are incarcerated in jails.

In the current study, the presence of SMI was conceptualized and operationalized as a dichotomous indicator; however, this limited our ability to examine the ways in which criminogenic risk levels might vary based on specific mental health diagnoses or severity of psychiatric symptoms. Additionally, another related limitation of this study is that information related to participants' use of psychotropic medication at the point of assessment of criminogenic risk levels was not available. The results of this study support the need for future research to engage direct examinations of the ways in which psychiatric symptoms may interact with criminogenic risk levels among people with serious mental illnesses. Another study limitation stems from the fact that only the Jail SMI sample included females. It is worth noting that some scholars have questioned whether the LSI is an appropriate measure for use with female offenders.^{58,59} Although numerous studies have demonstrated that the LSI is relevant to females, and that the LSI's predictive utility is not gender-dependent, more research is needed on the criminogenic risk levels of women with SMI.^{41,60-63} As a sensitivity analysis in the present study, we tested differences with the females ($n = 17$) excluded from the Jail SMI sample, and no substantive differences in the findings were observed.

Implications for behavioral health

The findings from this exploratory study inform future intervention research focused on developing and testing the efficacy of interventions that engage criminogenic risk factors in order to reduce criminal justice system involvement among justice-involved people with SMI. Once the efficacy of these interventions is established, further effectiveness research will need to examine how to embed these interventions into the existing array of mental health treatment services for justice-involved people with SMI in ways that support their continued efficacy. This paper focused on the treatment needs of justice-involved people with SMI associated with criminogenic risk factors. But, it is important to note that interventions designed to address these specific treatment needs will only be successful if they are delivered within the context of a larger services system that addresses this population's other co-occurring treatment needs. Osher et al. developed an integrated framework to guide efforts to address the co-occurring mental health, substance use, and criminogenic treatment needs of justice-involved people with SMI.⁶⁴ This framework can guide researcher, practitioner, and policy maker efforts to develop services that address the complex, interlocking treatment needs of justice-involved people with SMI, while also providing practitioners direction on how to develop individualized service plans that address how to treat each of these three different needs in holistic and coordinated manner in individual cases.⁶⁴

This study's findings also suggest efforts to develop interventions that address criminogenic risk factors among justice-involved people with SMI require further examinations of criminogenic risk factors among people with SMI early in their involvement with the criminal justice system. This type of examination may also help to increase our understanding of the dynamic interplay between symptoms of serious mental illness and criminogenic risks, as well as provide data useful in the design and implementation of interventions in this area. The findings of this research also suggest that the traditional "one-size-fits-all" approaches to addressing criminogenic risk factors in correctional populations might not be the best approach for addressing the criminogenic needs of justice-involved people with SMI. However, before conclusions can be drawn, more research is needed on the nature and distribution of criminogenic risk factors among people with SMI who are involved in the criminal justice system.

Conclusion

The findings presented here are some of the first to examine criminogenic risk levels of people with SMI across different levels of incarceration. As such, this study should inform future research on the development of interventions that address these risk factors among justice-involved people with SMI. However, as stated previously, interventions that address criminogenic risk factors will only be successful if delivered within the context of a larger array of treatment services designed to address individuals' mental illness and other treatment needs.⁶⁵ This research points to the need for more research on criminogenic risk factors among people with SMI generally. For example, these findings suggest that mental illness interacts with criminogenic risk factors in ways that heighten the strength of these risk factors for people with SMI. Initial steps in exploring this potential interaction would be to explore the relationship between levels of psychiatric symptomatology and criminogenic risk factors. This type of research will deepen our understanding of the potential relationship between these two treatment needs, while also providing some insight into how best to optimize the treatment of both conditions, be it through service coordinate, sequencing, or other methods. Other steps advance knowledge surrounding interventions that address criminogenic risk factors among justice-involved people with SMI include engaging examinations of the ways in which other factors such as age, gender, substance use, and prior criminal justice system involvement contribute to the criminogenic risk of those with SMI in jail and prison, and then to

compare the nature and strength of these relationships with the relationships observed among incarcerated individuals without SMI.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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