

A Systematic Review of Interventions Targeting Criminogenic Risk Factors Among Persons With Serious Mental Illness

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Objective: Individuals with serious mental illness are overrepresented in the criminal justice system. Research has found that interventions targeting risk factors for recidivism (i.e., criminogenic risks) reduce justice involvement in the general correctional population. However, more needs to be learned regarding use of these interventions among individuals with serious mental illness. To this end, this systematic review synthesized research on interventions that target criminogenic risk factors and are delivered to justice-involved individuals with serious mental illness.

Methods: A systematic search of six computerized bibliographic databases from inception to 2021 yielded 8,360 potentially relevant studies. Title and abstract screening, full-text reviews, and data extraction were performed independently, and discrepancies were resolved through discussion. To identify additional articles meeting inclusion criteria, experts in the field were contacted, and reference-harvesting techniques were used. Study quality was assessed with the Mixed Methods Appraisal Tool.

Results: Twenty-one studies were identified that evaluated nine interventions delivered to justice-involved individuals with serious mental illness. All identified programs targeted criminogenic risk factors, were group based, and used cognitive-behavioral strategies. Study quality was moderate to high. Interventions were associated with improvements in recidivism, violence, and criminogenic risk factors.

Conclusions: This review is the first to evaluate interventions targeting criminogenic risks among justice-involved individuals with serious mental illness. Findings suggest that outcomes associated with these interventions are promising. Given the overrepresentation of persons with serious mental illness in the criminal justice system, these findings provide an important step toward identifying services that curb justice involvement in this population.

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Persons with serious mental illness, such as schizophrenia, bipolar disorder, and major depressive disorder, are overrepresented in the U.S. criminal justice system. It is estimated that between 6% and 31% of individuals in jails and prisons and between 16% and 27% of those in community supervision programs have a serious mental illness (1–4), compared with 5.2% of the general U.S. population (5).

Once involved in the criminal justice system, individuals with serious mental illness—and particularly those with co-occurring disorders—recidivate sooner and more frequently than do their counterparts without mental illness (6–9). Persons with serious mental illness are 1.5 times more likely to be incarcerated than to be hospitalized for treatment of their psychiatric disorder, suggesting that many are located within the criminal justice system rather than in mental health treatment settings (10). These findings signal

the urgent need for services that effectively reduce rates of recidivism in this population.

HIGHLIGHTS

- This systematic review synthesized the evidence base for interventions that target criminogenic risk factors among justice-involved persons with serious mental illness.
- Twenty-one studies examining nine interventions were identified.
- Identified interventions were associated with reductions in recidivism, violence, and criminogenic risk factors among justice-involved individuals with serious mental illness.
- More research is needed to determine the specific program elements contributing to the programs' efficacy.

Over the past 20 years, interventions targeting justice-involved individuals with serious mental illness have primarily focused on reducing criminal justice system involvement by strengthening linkages to mental health services (11). These first-generation services shared the underlying assumptions that untreated symptoms of mental illness are the primary driver of criminal behavior among those with serious mental illness and that connecting persons with mental health problems to psychiatric services is the most effective strategy for reducing justice involvement in this population (12).

Although many first-generation services have been demonstrated to reduce mental health symptoms, they have yet to show a consistent impact on criminal justice involvement among individuals with serious mental illness (13). This lack of consistent evidence persists even among studies that evaluate empirically supported mental health services (10, 14–17), suggesting that mental health treatment alone is insufficient for reducing criminal justice involvement in this population.

The problems associated with first-generation services have prompted growing calls to expand the range of services for justice-involved persons with serious mental illness to include interventions that explicitly target empirically validated risk factors for criminal recidivism (18). The risk-need-responsivity (RNR) model outlines eight such risk factors, termed criminogenic risks: antisocial personality, antisocial behavior, antisocial cognition, antisocial associates, substance abuse, problematic marital and family circumstances, problematic circumstances at work or school, and problematic circumstances with leisure and recreation (19). Of these risk factors, the first four (i.e., the “big four”: antisocial personality, antisocial behavior, antisocial cognition, and antisocial associates) are often prioritized in interventions targeting recidivism, because they have been found to have the strongest relationship with criminal offending (20).

Although most research on the RNR model has been conducted among general correctional samples, research suggests that the central eight risk factors robustly predict the likelihood of criminal offending among justice-involved individuals with serious mental illness (21, 22). For example, individuals with serious mental illness have been found to have criminogenic risk factor levels that equal or exceed those of their counterparts without mental illness (7, 23). Studies suggest that these risk factors may even mediate the relationship between mental illness and criminal behavior (24), providing further support for their salience among justice-involved individuals with serious mental illness.

Despite evidence that persons with and persons without serious mental illness share the same risk factors for criminal behavior, criminogenic risk factors are not frequently targeted by first-generation services (13). Indeed, research suggests that the most effective interventions for justice-involved individuals with serious mental illness address both psychiatric and criminogenic risk factors (25), affirming the need to expand the services available to this population

in order to include interventions that explicitly address criminogenic risk factors. However, the use and efficacy of interventions targeting these factors among individuals with serious mental illness remain understudied.

Several meta-analyses have examined the efficacy of interventions targeting criminogenic and noncriminogenic risk factors delivered to justice-involved persons with a broad range of mental illnesses. For example, one meta-analysis by Martin and colleagues (26) found that interventions delivered to individuals with mental illness were associated with modest reductions in criminal justice recidivism, as well as improvements in mental health symptoms and functioning. Another meta-analysis by Morgan et al. (25) found that interventions delivered to justice-involved individuals with mental illness were associated with improvements in mental health symptoms, coping, and institutional adjustment. However, findings were inconclusive with respect to the effect of these interventions on recidivism. Although both meta-analyses have substantially contributed to the literature, they were published nearly 10 years ago and focused on general interventions delivered to justice-involved individuals with a relatively broad range of mental illnesses. To our knowledge, no available study has systematically examined interventions targeting criminogenic risk factors specifically among justice-involved persons with serious and persistent mental illness. This lack of studies represents a critical research gap, given the strong calls for development and implementation of interventions that target criminogenic risk factors in this population (27–29).

To address this gap, we conducted a systematic review of research evaluating interventions targeting criminogenic risk factors among justice-involved individuals with serious mental illness. Our primary aims were to evaluate the methodological characteristics of studies examining these interventions, assess the characteristics of the interventions examined, and review substantive study findings.

METHODS

Eligibility Criteria

This review was developed by using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (30). Before searching for articles, we submitted a review protocol to PROSPERO, an international prospective register for review protocols (registration no. CRD42020160638).

Two authors (A.P., M.V.) assessed studies for inclusion in the review. Included studies had to evaluate the findings of interventions addressing criminogenic risks among justice-involved persons with serious mental illness, report on interventions that directly targeted or had as a primary outcome one of the big four criminogenic risk factors, target adults ages ≥ 18 years, and be published in English. Samples of persons with co-occurring substance use disorders were included. Abstracts, dissertations, opinion articles, editorials, review articles, and manuals were excluded from review, as

were articles evaluating samples consisting solely of persons with sex offenses or general psychopathy. Articles were searched from database inception and were not excluded on the basis of publication date.

For this review, serious mental illness was defined to include schizophrenia, schizoaffective disorder, psychotic disorders, major depressive disorder, and bipolar disorder. To determine whether studies examined samples that aligned with this definition, we first evaluated the inclusion criteria of each article. Studies that examined participants with one or more of these disorders were included. Studies that examined samples with a broader scope of mental disorders were included only if they reported results separately by diagnosis. When studies did not provide clear details regarding the diagnostic composition of their samples, study authors were contacted for further clarification.

Search Strategy

Search terms were developed in consultation with a university reference librarian and included keywords pertaining to mental illness, criminal justice system involvement, the big four criminogenic risk factors, and interventions (see the online supplement to this article for lists of these terms).

Three members of the research team (A.P., M.V., J.P.) conducted searches of six electronic databases: PubMed, PsycInfo, Web of Science, the Cumulative Index to Nursing and Allied Health Literature (commonly known as CINAHL), Sociological Abstracts, and the ProQuest Criminal Justice Database. Searches were conducted in February 2019, repeated in September 2020, and again repeated in April 2021, by using expanded search terms to identify articles that were published after the initial search was conducted. Two researchers (A.P., M.V.) independently screened search results on the basis of the titles and abstracts and excluded studies that did not meet the predetermined eligibility criteria. Following title and abstract searches, both researchers independently conducted a full-text review of all remaining articles. The two researchers read each study and excluded those that did not meet the inclusion criteria.

To locate additional studies that may have been missed in the initial searches, we used several additional search methods. First, we examined the reference lists of articles selected for inclusion. Second, we contacted the lead authors of the included studies to identify additional published and unpublished literatures. Third, we reviewed government websites to identify correctional interventions for justice-involved individuals with serious mental illness and the corresponding studies evaluating these interventions. When discrepancies arose during the search process, both researchers (A.P., M.V.) met and resolved differences through discussion (see online supplement for a flow diagram illustrating the search results). The search yielded 8,360 potentially relevant studies.

Data Extraction

Three study team members (A.P., J.P., E.D.) independently extracted data from each identified study by using a coding form developed by the study team. One researcher (A.P.) extracted data from 100% of included studies, and two separate team members (J.P., E.D.) extracted data from 50% of included studies. All discrepancies arising during the search and extraction process were resolved through mutual discussion. Data were managed with Covidence software.

Quality Assessment

Two researchers (A.P., M.V.) independently assessed the methodological strengths and limitations of included studies by using the Mixed Methods Appraisal Tool (MMAT) (31). Individual discrepancies in ratings were resolved through discussion. Studies in this review used both qualitative and quantitative methods, and the MMAT was selected because it enables the simultaneous evaluation of both study types with a single tool.

RESULTS

Our search identified 21 (27, 28, 32–50) studies evaluating nine programs that targeted criminogenic risk factors and were delivered to justice-involved persons with serious mental illness. Given the broad scope of this review, we organized its results into three overarching areas: methodological characteristics, intervention characteristics, and substantive findings.

Methodological Characteristics

Samples. The 21 studies evaluated 14 independent samples ($N=1,175$). Sample sizes ranged from 24 (27) to 181 (46), and mean ages of the samples ranged from 29 years (43) to 44 years (27). Fourteen studies examined samples comprising only men, and four examined predominantly male samples (27, 28, 32–42, 44, 45, 48–50). One study examined an all-women sample (43), and two studies did not provide demographic information for the individuals in the sample with serious mental illness (46, 47). Eight studies excluded participants who were not proficient in English (28, 33–35, 37, 43–45).

Twelve studies reported the racial-ethnic composition of their samples. Erickson et al. (38) examined a sample that was 69% African American, 22% White, 6% Hispanic, and 3% “other.” Lamberti and colleagues (28) also examined a sample that was predominantly African American (73%), with lower proportions of White (19%) and Hispanic (8%) participants. Similarly, the sample examined by Carr and Cassidy (36) was predominantly African American (56%), followed by White (25%) and Hispanic (16%). The sample in a study by Wilson et al. (27) was almost entirely African American (92%), with only 8% of participants identifying as White. Three studies reported on participants from the same randomized controlled trial (RCT) (33–35). Half the participants in this sample identified as African American or

African Caribbean, 32% identified as White, and 18% identified as “other.” By contrast, approximately half the participants in each of the remaining five studies, three of which examined the same sample, identified as White (32, 41, 44, 49, 50). The high proportion of African American individuals and low proportion of Hispanic individuals in five of these samples diverge from estimates of prison and parole populations aggregated at the national level. However, the proportions may reflect the considerable variation in demographic characteristics at state levels (51).

Seventeen studies reported information regarding the specific mental disorder diagnoses of participating individuals. Nine studies reported that most participants met criteria for a diagnosis of schizophrenia (28, 32–35, 38–40, 48), two examining the same sample reported that participants were predominantly diagnosed as having depression (42, 49), and five reported that their sample predominantly met criteria for a psychotic disorder (36, 43, 44, 46, 47)

Quality. Studies were appraised with MMAT criteria specific to their design. The methodological quality of all studies was evaluated, with the exception of one feasibility study (39) that was described in a letter to an editor and did not have a corresponding primary research article. Consequently, only 20 studies received MMAT ratings. We assessed whether these studies met each MMAT criterion or not; affirmative responses are indicated by checkmarks in Table 1. Overall, 55% (N=11) of the studies were rated as having high methodological quality (i.e., meeting $\geq 80\%$ of assessed criteria within their methodological domain), and 15% (N=3) were of moderate methodological quality (i.e., meeting 60%–79% of the assessed criteria).

Intervention Characteristics

Most studies included in this review evaluated interventions adapted from correctional programs to address the specific needs of justice-involved individuals with mental illness. These interventions included the Reasoning and Rehabilitation Mental Health Program (R&R2MHP) (37, 43–45), the System for Treatment and Abatement of Interpersonal Risk (STAIR) program (46, 47), a modified therapeutic community (MTC) program (41, 42), the Monterey County Supervised Treatment After Release (MCSTAR) program (32), and a targeted service delivery approach (TSDA) (27).

Two studies examined forensic assertive community treatment (FACT) programs (28, 38), which adapted a mental health service model to meet the needs of justice-involved individuals. Only two interventions were specifically designed for justice-involved persons with mental illness: the Community Reporting Engagement Support and Training (CREST) program (36) and the Violent Offender Treatment Program (VOTP) (40). Five studies (33–35, 39, 48) evaluated the Reasoning and Rehabilitation (R&R) program, which was designed for general offending populations and delivered to persons with serious mental illness without modification.

Details of each program are summarized in Table 2. The rationale and methods used to design or adapt programs to meet the needs of justice-involved individuals with serious mental illness are presented below.

Ashford and colleagues (32) adapted the MCSTAR program to address the needs of persons with serious mental illness. MCSTAR is a modified version of the Options program originally developed by Bush and Bilo-deau (52). Whereas the Options program includes 36 two-hour sessions delivered two to five times per week for 8 weeks, this pace was slowed to accommodate the needs of the sample, which extended the treatment period to 4–6 months.

Wilson and colleagues (27) outlined the development of the TSDA, which is a set of five strategies designed to tailor the delivery of cognitive-behavioral interventions targeting criminogenic risk factors to address the neurocognitive and social learning needs of persons with serious mental illness. These strategies include repetition and frequent summarizing, amplification techniques, active coaching, low-demand practice, and maximizing participation.

Four articles evaluated R&R2MHP (37, 43–45), an adapted version of the R&R program. To better engage the needs of individuals with serious mental illness, the program developers reduced the number of modules from 36 to 16, provided additional individual sessions by a mentor, and included an additional module focused on improving participants’ executive functioning (37).

Two reports examined the STAIR program (46, 47), which is adapted from a cognitive skills program originally developed for justice-involved people without mental illness. The STAIR program is delivered in inpatient treatment programs and includes a behavioral grading system. Participants receiving this intervention must meet a series of requirements to complete seven sequential steps, which become increasingly challenging. Each step is associated with rewards and privileges, and participants can move up or down a step according to their program performance (46, 47).

Four studies evaluated the MTC (41, 42, 49, 50), which is a modified therapeutic community residential program designed to address the needs of justice-involved persons with co-occurring mental illness and substance misuse. The MTC adapts the structure and content of the standard therapeutic community approach by reducing interpersonal interactions, providing individualized treatment planning, and increasing program flexibility. It also incorporates specific content areas designed to address the needs of justice-involved persons with co-occurring disorders, including psychoeducation and cognitive-behavioral protocols (42).

FACT programs are modified from the assertive community treatment model, which is designed for individuals with serious mental illness who have difficulty engaging in mental health treatment (28, 38).

TABLE 1. Methodological characteristics of studies evaluating interventions targeting criminogenic risks among justice-involved persons with serious mental illness

Study	All ^a		RCT ^b					Nonrandom ^c					Descriptive ^d					Qualitative ^e					
	1	2	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
Ashford et al., 2008 (32)	✓	✓						✓	✓														
Carr and Cassidy, 2016 (36)	✓	✓											✓		✓	✓	✓						
Clarke et al., 2010 (48)	✓	✓						✓	✓	✓	✓												
Cullen et al., 2011 (35)	✓	✓											✓		✓	✓	✓						
Cullen et al., 2012 (34)	✓	✓	✓	✓	✓																		
Cullen et al., 2012 (33)	✓	✓	✓	✓	✓																		
C-Y Yip et al., 2013 (37)	✓	✓						✓			✓	✓											
Erickson et al., 2009 (38)	✓	✓											✓										✓
Jotangia et al., 2015 (43)	✓	✓						✓	✓	✓	✓	✓											
Howden et al., 2018 (40)	✓	✓						✓	✓			✓											
Lamberti et al., 2017 (28)	✓	✓	✓	✓	✓																		
McKendrick et al., 2006 (42)	✓	✓		✓																			✓
Rees-Jones et al., 2012 (45)	✓	✓							✓	✓	✓	✓											
Sacks et al., 2004 (41)	✓	✓		✓																			✓
Sullivan et al., 2007 (49)	✓	✓		✓																			✓
Sullivan et al., 2007 (50)	✓	✓		✓								✓											✓
Wilson et al., 2018 (27)																						✓	✓
Yates et al., 2005 (46)	✓	✓											✓		✓								✓
Yates et al., 2010 (47)	✓	✓											✓		✓	✓	✓						✓
Young et al., 2016 (44)	✓	✓											✓		✓	✓	✓						✓

^a Questions for all studies: 1. Are there clear research questions? 2. Do the collected data enable the researchers to address the research question?

^b Quantitative randomized controlled trial (RCT): 1. Is randomization performed appropriately? 2. Are the groups comparable at baseline? 3. Are there complete outcome data? 4. Are outcome assessors blinded to the intervention provided? 5. Did the participants adhere to the assigned intervention?

^c Quantitative nonrandomized studies: 1. Are the participants representative of the target population? 2. Are measures appropriate regarding both the outcome and the intervention (or exposure)? 3. Are there complete outcome data? 4. Are the confounders accounted for in the design and analysis? 5. During the study period, is the intervention administered (or did exposure occur) as intended?

^d Quantitative descriptive studies: 1. Is the sampling strategy relevant to address the research question? 2. Is the sample representative of the target population? 3. Are the measurements appropriate? 4. Is the risk of nonresponse bias low? 5. Is the statistical analysis appropriate to answer the research question?

^e Qualitative studies: 1. Is the qualitative approach appropriate to answer the research question? 2. Are the qualitative data collection methods adequate to address the research question? 3. Are the findings adequately derived from the data? 4. Is the interpretation of results sufficiently substantiated by data? 5. Is there coherence between qualitative data sources, collection, analysis, and interpretation?

FACT programs adapt this service model to better meet needs of those with serious mental illness and concurrent justice system involvement. Although there is significant variation in the structures, operations, and treatment populations of FACT programs, common components include use of boundary spanners, partnerships with police and probation officers, peer specialists, trauma-informed treatment, and residential treatment (28).

The CREST program represents a collaborative agreement between a day-reporting center and a local community mental health clinic (36). It provides an array of options to meet the needs of justice-involved populations with serious mental illness, including manualized cognitive-behavioral and psychoeducational programs and curricula targeting specific criminogenic risks, relapse prevention, health, wellness, and life skills.

VOTP is a modular, cognitive-behavioral program developed to address the risk for violent behavior among justice-involved individuals with mental illness within health care settings (40). The VOTP was developed by considering the criminogenic risk factors associated with violent behavior and the responsivity factors associated with mental illness (53).

Substantive Findings

Studies included in this review yielded several substantive findings, which we organized into seven primary outcomes. Three outcomes represent the criminogenic risk factors of antisocial personality pattern, antisocial cognitions, and substance abuse. The remaining outcomes are related to recidivism, violence, mental health, and treatment completion. (Data associated with these outcomes, including the effect sizes reported by each study, are presented in a table in the online supplement.)

Antisocial personality pattern. Six quasi-experimental studies evaluated changes in measures related to the criminogenic risk of the antisocial personality pattern (37, 42–45, 48). As outlined in the RNR model, these needs include interpersonal problem solving, self-management and control, and anger. Four studies evaluated R&RMH2P (37, 43–45), and two examined R&R (34, 48).

Three studies compared outcomes among participants assigned to receive R&R2MHP with outcomes among those assigned to treatment as usual (37, 43, 45). Across studies, R&R2MHP participants had significant improvements in social problem solving as assessed by the Social Problem Solving Inventory Revised–Short Form (SPSI-RS), with all

TABLE 2. Interventions delivered to justice-involved persons with serious mental illness

Intervention	Description	Clinical orientation	Treatment targets	Setting	Structure	Length and duration
Reasoning and Rehabilitation (R&R)	Manualized cognitive-behavioral intervention developed for antisocial adolescents and adults evidencing antisocial behaviors or criminal behavior	Cognitive behavioral	Problem solving, criminal thinking, antisocial behavior	Forensic hospitals	Weekly group and individual sessions delivered by trained facilitators	36 structured, 90-minute sessions
Reasoning and Rehabilitation Mental Health Program (R&R2MHP)	A revised version of R&R developed for antisocial adolescents and adults evidencing antisocial behaviors or criminal behavior who have mental health problems	Cognitive behavioral	Self-control, problem solving, emotional control, social skills, critical reasoning	Forensic hospitals	Weekly group and individual sessions delivered by trained facilitators. Each participant meets weekly with a peer mentor to assist with skill building.	16 structured, 90-minute sessions
Forensic assertive community treatment programs (FACT)	A team-based service delivery model for justice-involved individuals with serious mental illness. Builds on the assertive community treatment model by addressing criminal justice issues	Cognitive behavioral	Modifiable risk factors for criminal recidivism	Outpatient community treatment centers	Clinical and case management services are delivered by a multidisciplinary team that maintains a partnership with a criminal justice agency to perform jail diversion.	Services delivered as needed 24/7
System for Treatment and Abatement of Interpersonal Risk program (STAIR)	Inpatient program developed for justice-involved persons with mental health problems	Cognitive behavioral	Problem solving, creative thinking, values enhancement, social skills, critical reasoning, managing emotions	Psychiatric hospitals	Weekly group therapy sessions are delivered by trained social workers or psychologists. Incorporates a contingency management component consisting of seven steps designed to reward participants for their treatment progress. All participants are provided with psychopharmacological management.	72 45-minute sessions delivered twice a week for 6 months or more
Modified therapeutic community (MTC)	A residential, modified therapeutic community cognitive-behavioral treatment program designed for delivery in institutional settings	Cognitive behavioral	Substance abuse, mental illness, criminal thinking, criminal behavior	Community	Psychoeducational classes, cognitive-behavioral protocols, medication, and therapeutic interventions. Services include a peer-based component.	4–5 hours per day, 5 days a week for 12 months

continued

TABLE 2, continued

Intervention	Description	Clinical orientation	Treatment targets	Setting	Structure	Length and duration
Monterey County Supervised Treatment After Release (MCSTAR)	Comprehensive postplea diversion programs designed to target criminal behavior; included a constituent program, Creating New Choices	Cognitive behavioral	Criminal thinking, hostile attributions	Community	A mental health court intervention, psychiatric treatment, supervision and support through a FACT team, and special housing resources. Also includes a cognitive intervention based on the Options program and modified by the Maricopa County Adult Probation Department. This intervention targets antisocial attitudes, problem solving, and decision-making skills.	36 2-hour sessions typically offered two to five times a week for about 8 weeks. This time frame was modified to be delivered over 4–6 months.
Community Reporting Engagement Support and Training (CREST)	Enhanced, cognitive-behavioral day-reporting program delivered in collaboration with a local community mental health clinic	Cognitive behavioral	Relapse prevention, health and wellness, life skills	Enhanced day-reporting center	Psychiatric assessment and treatment services, case management, and psychosocial program that uses a cognitive-behavioral approach. Manual-based, cognitive-behavioral, and psychoeducational groups are offered, and the program is delivered in part by peer specialists.	Schedule varies depending on need. Program length and completion are determined by day-reporting center staff.
Targeted service delivery approach (TSDA)	A set of five service delivery strategies designed to be used with cognitive-behavioral interventions targeting criminal risk factors to increase their responsibility to the needs of justice-involved persons with serious mental illness	Cognitive behavioral	Criminogenic risk factors	Prison	The TSDA was used to adapt the delivery of interventions targeting criminogenic risks to meet the needs of persons with mental illness. Interventions using the TSDA are delivered by two trained facilitators weekly.	Underlying cognitive-behavioral intervention delivered over two 60- to 90-minute sessions twice per week for 12–14 weeks
Violent Offender Treatment Program (VOTP)	A cognitive-behavioral program developed for men with mental disorders in forensic hospitals who have habitual aggression and high risk for violent recidivism	Cognitive behavioral	Symptom-related violence, violence displayed as a result of symptomatology, and violence independent of symptomatology	Medium secure unit in a psychiatric hospital	9 manualized treatment modules delivered in four phases and delivered in twice-weekly, 2-hour sessions. Participants also receive support from mentors in between sessions.	84 hours of treatment facilitated over a 7-month period

three studies reporting significant treatment effects via the rational problem-solving subscale (37, 43, 45). Cohen's *d* values for these treatment effects ranged from 0.33 (45) to 0.85 (37). Two studies also found improved self-control among R&R2MHP participants, compared with treatment as usual, as measured by the Locus of Control Scale (LoC), with Cohen's *d* values of 0.23 (45) and 1.17 (43), and one study noted treatment effects as measured by the Ways of Coping Scale ($d=1.19$) (37). Two of the three studies (37, 45) found significant treatment effects for disruptive behaviors and problems as measured by the Disruptive Behavior and Social Problems Scale (DBSP) total score, with Cohen's *d* values of 0.25 (45) and 0.77 (37). One study noted improvements in anger as assessed by the Novaco Anger Scale (NAS) cognitive domain subscale ($d=0.02$) (45).

The fourth study examining R&R2MHP (44) combined data from two other studies in this review (37, 45). Comparisons of pre- and posttreatment means among R&R2MHP program completers indicated significant improvements in SPSI-RS, NAS, and DBSP scores, with Cohen's *d* values of 0.27, 0.23, and 0.27, respectively. Changes in LoC scores were not significant.

Similar results were obtained by Clarke and colleagues (48), who found that participants receiving R&R had significantly improved SPSI-RS scores ($p=0.002$), compared with the group receiving treatment as usual, even after adjustment for pretreatment scores. That study also found significant improvements in R&R participants' adaptive coping responses, as assessed with the Coping Responses Inventory emotional discharge subscale ($p<0.001$) and approach summary index subscale ($p<0.001$), compared with those receiving treatment as usual. An RCT by Cullen et al. (34) also found salutary effects of R&R participation on antisocial personality disorder: at a 12-month follow-up, participation in R&R was associated with greater improvement in the SPSI-RS impulsive-carelessness style ($\beta=-2.12$, $p=0.02$), compared with treatment as usual. However, R&R participants had less improvement in negative problem orientation on the SPSI-RS than those receiving treatment as usual, and no treatment effects were found for the NAS.

Antisocial cognitions. Three studies evaluated the impact of correctional interventions on antisocial cognitions (32, 34, 48). The first compared pre- and posttest mean differences among individuals who participated in the MCSTAR program (32). MCSTAR participants showed significant mean reductions in their scores on the Criminal Sentiments Scale-Modified (CSS-M) and the Hostile Interpretations Questionnaire (HIQ). At a 12-month follow-up, arrested and nonarrested MCSTAR participants had significant differences in mean change scores on the identification with criminal others subscale of the CSS-M ($\eta_p^2=0.27$) and the overgeneralization subscale of the HIQ ($\eta_p^2=0.23$). Similarly, participants with and without technical violations had significant differences in mean change scores on the HIQ authority subscale ($\eta_p^2=0.19$). No significant changes were found on the Pride in Delinquency Scale.

The remaining two studies examined the impact of the R&R program on persons with serious mental illness recruited from medium-security forensic hospitals (34, 48). In the first study, comparisons of pre- and posttreatment mean differences between R&R participants and a group receiving treatment as usual did not reveal significant differences in the Crime Pics II (CPII) inventory, which was used to assess antisocial attitudes (48). Similarly, the second study, by Cullen et al. (34), did not observe treatment effects for antisocial attitudes as measured by the CPII at 12-month follow-up.

Substance abuse. Four studies examined treatment outcomes for individuals with substance use (33, 41, 42, 50). The first compared the impacts of R&R and treatment as usual on men with mental and substance use disorders in secure forensic outpatient facilities (33). An intent-to-treat (ITT) analysis did not reveal significant between-group differences on any substance use measures during the 6-month treatment period or at a 12-month posttreatment follow-up (33).

The remaining studies evaluated the same sample of incarcerated men with mental and substance use disorders randomly assigned to receive either the MTC program or a standard prison-based mental health program (41, 42, 50). Among the MTC participants, half entered an aftercare program and were evaluated separately from those who received MTC but did not participate in aftercare.

At 12 months postrelease, Sacks and colleagues (41) found that MTC participants who participated in aftercare had lower odds of committing an alcohol or drug offense in the community, compared with those in the standard prison-based program (odds ratio [OR]=0.36, $p=0.03$). No treatment effects were observed among participants who received MTC without aftercare or in the combined sample of participants who received MTC with and without aftercare (41). A secondary analysis of the same sample found that MTC participants who did or did not participate in aftercare had lower odds of substance use (OR=0.34, $p=0.01$), illegal drug use (OR=0.43, $p=0.05$), and alcohol use to intoxication (OR=0.34, $p=0.02$) at 12-month follow-up, compared with those in the standard prison-based program (50).

The same sample was also evaluated by Sacks and colleagues (41) and McKendrick et al. (42) to compare the impact of the MTC program (with and without aftercare) on subsamples of participants with and without antisocial personality disorder. Significant treatment effects were found among participants with antisocial personality disorder for overall measures of substance use ($\beta=0.23$, $p=0.01$) and number of drugs used ($\beta=0.28$, $p<0.05$). Moreover, the analysis found positive treatment effects on the frequency of drugs used regardless of antisocial personality disorder diagnosis ($\beta=0.33$, $p<0.05$). However, treatment effects were not observed for either group regarding alcohol intoxication, illegal drug use, or the impact of different drugs used (42).

Recidivism. Five studies examined the effect of criminogenic interventions on recidivism-related outcomes (28, 32, 41, 42, 47). All five studies reported that participation in interventions targeting criminogenic risk factors reduced at least one measure of criminal justice involvement.

Two studies evaluated outcomes from the same sample of participants receiving MTC (41, 42). Sacks and colleagues (41) found a significantly lower likelihood of reincarceration at 12 months after prison release among participants randomly assigned to the MTC program (OR=0.26, $p=0.01$) and the subset of participants who received MTC and aftercare (OR=0.13, $p=0.02$), compared with those in the mental health treatment control group. Participants who received MTC and aftercare also had significantly lower odds of criminal activity (OR=0.43, $p=0.05$). A subsequent analysis of the same sample found that treatment effects on reincarceration during the same period were statistically significant among individuals with antisocial personality disorder ($\beta=0.36$, $p<0.05$) but not among those without antisocial personality disorder. Participants without antisocial personality disorder had significant reductions in general measures of crime ($\beta=0.19$, $p=0.02$), which were not observed among participants with antisocial personality disorder (42). Similarly, Lamberti and colleagues (28) found that participants receiving FACT had fewer criminal convictions ($B=-0.86$, $p=0.023$) and spent fewer days in jail ($B=-0.71$, $p=0.025$) than did control group participants.

Ashford et al. (32) found that individuals who participated in the MCSTAR program had fewer arrests ($\eta_p^2=0.19$), compared with a treatment-as-usual comparison group, but a greater number of technical probation violations ($\eta_p^2=0.38$) during the 12 months following community re-entry. However, the authors did not explicitly include baseline scores of these variables as covariates in their analysis of covariance models, which may have influenced the significance of their findings.

Although Yates and colleagues (47) found that the STAIR program significantly decreased the number of arrests in their sample of participants with and without serious mental illness as a whole, they did not find that the presence of a serious mental illness diagnosis had an impact on whether participants were rearrested, rehospitalized, or remained stable in the community after treatment.

Violence. Six studies assessed outcomes related to violence, which included verbal aggression and violent attitudes (33, 37, 40, 43–45). All six studies found improvements in at least one violence measure.

Cullen and colleagues (33) evaluated verbal aggression and violence among participants randomly assigned to receive R&R. Both outcomes were measured by reviewing clinical files. Findings from regression models controlling for pretreatment prevalence of verbal aggression and violence revealed that verbal aggression among R&R participants decreased during the treatment period (incidence rate ratio [IRR]= 0.49, $p=0.01$) and at a 12-month follow-up

assessment (IRR=0.56, $p=0.02$), compared with the treatment-as-usual group. No statistically significant treatment results were detected for the incidence of physical violence.

Four studies examined the effect of participation in R&R2MHP on attitudes toward violence as measured by the Maudsley Violence Questionnaire (MVQ) (37, 43–45). ITT analyses by both C-Y Yip and colleagues (37) and Rees-Jones et al. (45) found that R&R2MHP participants had significantly lower MVQ scores compared with participants assigned to a treatment-as-usual group, with Cohen's d values of 0.52 (37) and 0.23 (45). By contrast, differences in the MVQ total and subscale scores between adult female participants in R&R2MHP and treatment-as-usual groups were not statistically significant at posttreatment or 3-month follow-up (43). A pooled secondary data analysis of the sample from C-Y Yip et al. (37) and Rees-Jones et al. (45) confirmed posttreatment differences in total MVQ scores of adult men who participated in R&R2MHP ($d=0.43$) (44).

One study examined the effect of VOTP participation on violence as measured by pre-post change scores on the Violence Risk Scale (VRS), the Historical Clinical Risk Management–20 (HCR-20), the Goal Attainment Scale for Violence (GAS-V), the Firestone Assessment of Violent Thoughts (FAVT), and the State Trait Anger Expression Inventory (STAXI) anger expression out subscale (40). After treatment, VRS scores were significantly improved for 52% of the sample, and GAS-V scores were significantly improved for 60% of the sample. No clinically significant changes were observed on the HCR-20. In total, 28% of participants experienced deterioration in their FAVT scores, 52% had significantly improved STAXI scores, and 24% had worse STAXI scores after treatment (40).

Mental health. Three studies reported treatment outcomes related to mental health among study participants (28, 47, 49). The authors of the first study (47) found that rates of psychiatric diagnoses consistent with serious mental illness did not significantly differ between participants who were or were not rehospitalized after group participation. The second study (28) reported that participants assigned to the FACT program had greater levels of mental health service engagement, including more time in outpatient treatment ($B=0.59$, $p<0.001$) and more outpatient service contacts ($B=2.1$, $p<0.001$), compared with control group participants. FACT participants also had fewer hospitalizations ($B=-1.1$, $p=0.042$) and days spent in the hospital ($B=-1.68$, $p=0.025$).

The results of the third study (49) did not indicate significant differences between participants receiving MTC and those in a mental health control group in measures of symptom changes as assessed by the Beck Depression Inventory or Manifest Anxiety Scale. However, both groups experienced significant decreases in symptom severity as measured by the Brief Symptom Inventory global severity index ($p=0.01$).

Treatment completion. Rates of treatment completion ranged from 0% (39) to 89% (43). One feasibility study of the R&R program reported that among 28 male participants with serious mental illness, only three attended any R&R session (39). Four studies compared participants who did or did not complete treatment to identify correlates and predictors of successful program completion (35, 36, 44, 46). These studies identified a diverse range of factors associated with treatment noncompletion, including antisocial personality disorder (35), recent violence (35), substance use (36), accommodation difficulties (36), financial difficulties (36), older age (36), not taking oral psychotropic medications (44), and higher levels of disruptive behaviors (44). However, one study reported that serious mental illness diagnoses did not have an impact on treatment completion rates among participants in a psychiatric treatment program (47).

DISCUSSION

Our findings indicate that a growing body of research is focused on adapting and testing interventions that target criminogenic risk factors among persons with serious mental illness. Our literature searches identified nine interventions, and the research on their effectiveness, although preliminary, reveals that these interventions are having positive effects on their intended outcomes.

One of the notable findings from this review is the amount of research that has focused on developing interventions that address criminogenic risk factors among individuals with serious mental illness. We found that the most common approach to developing these interventions involved adapting existing evidence-based correctional interventions to accommodate the needs of those with serious mental illness (37, 41–47, 49, 50). This approach is consistent with research that called on the field to leverage what is known about treating criminogenic risk factors generally when developing interventions for individuals with serious mental illness (29). It is also consistent with the responsivity principle of the RNR model, which emphasizes the need to tailor evidence-based interventions to the learning and treatment needs of specific populations (19). However, we also note the promising results from research that has explored other ways of developing these interventions, including adapting mental health interventions, such as FACT (28, 38), and developing new interventions specifically designed to meet the needs of justice-involved persons with serious mental illness (36, 40).

Methodological Characteristics

Our first aim was to evaluate the methodological characteristics of the reviewed studies. Given the broad scope of this review, we placed no methodological limitations on the included studies. Therefore, it is not appropriate to draw general conclusions about the quality or methodological rigor of research in this area. That said, several notable trends emerged. A considerable strength of the reviewed

studies was the consistent use of validated measures to assess intervention outcomes. Although the overall quality of the included studies was rated moderate to high, many studies had small samples, limiting statistical power to detect significant treatment effects. Although eight studies had 12-month follow-up periods (28, 32–34, 41, 42, 49, 50), the remaining studies used shorter periods or assessed outcomes only at posttreatment. Only nine studies used ITT analyses, potentially biasing findings and limiting generalizability (28, 32, 33, 37, 41, 43, 45, 49, 50). Treatment fidelity was monitored in several studies (33, 35, 37, 43, 45, 48), but only one study included a formal assessment of fidelity, which was found to be high (28). None of the studies discussed whether outcome assessors were masked to participants' treatment condition, which may have introduced the possibility of assessment bias. Additionally, none of the studies in this review—RCT or otherwise—provided the information needed to determine whether participants were representative of their target population, potentially limiting external validity.

Intervention Characteristics

Our second aim was to describe the characteristics of the interventions identified in this review. All nine programs used a cognitive-behavioral orientation and targeted at least one criminogenic risk factor. Treatment targets varied significantly, and the most commonly reported targets were related to two criminogenic risk factors, criminal thinking and lack of problem-solving skills (19). There was also a broad range in the number of sessions in each program, which ranged from 16 (R&R) to 72 (STAIR). Session lengths also varied widely, ranging from 45 minutes (STAIR) to 5 hours (MTC). Interventions were delivered in several settings, including prisons, community settings, and secure forensic hospitals. Notably, only the studies examining R&R (33–35, 39, 48) and R&R2MHP (37, 43–45) reported that interventions were modified for delivery in settings other than those for which they were originally developed.

Substantive Findings

Our final aim was to provide a summary of the substantive findings of included studies. One of the most challenging aspects of this review was the wide range of outcomes reported and the lack of standardization of measures used within each outcome domain. That said, study findings indicated that interventions had a positive and sizable impact on some key treatment targets related to the RNR model's criminogenic risk factors associated with antisocial personality patterns and antisocial cognitions. Consistent with other RNR research, the programs' impact on substance abuse was mixed but promising (33, 41, 42, 50). Some of the weakest treatment effects were associated with studies that examined the R&R program, which was not adapted specifically for use with individuals with serious mental illness.

Findings related to recidivism and violence were similarly positive. Eleven studies examined recidivism or

violence outcomes (28, 32, 33, 37, 40–45, 47); all of them reported that participation in interventions targeting criminogenic risk factors reduced at least one measure of criminal justice involvement or violence.

Only three studies evaluated mental health outcomes (28, 46, 49). Of these studies, only one reported treatment effects on mental health measures, with participants who received FACT reporting less use of emergency mental health services after participation in the program (28). On the one hand, this is unsurprising given the fact that mental health symptoms are not the direct target of treatment in interventions that adhere to the RNR model. Yet it is possible that there could be spillover effects related to treatment engagement or psychiatric symptomatology that can be identified only if measures are routinely included in evaluations of program effectiveness.

Limitations

Our review had several limitations that should be considered when interpreting its findings. Although our search process was comprehensive and designed to identify both published and unpublished studies, it is possible that relevant articles may have been missed. The small number of studies and overlapping samples may also limit the generalizability of our findings. We also used a conservative definition of serious mental illness, resulting in the exclusion of studies that relied on a broader definition of this term. However, our definition was consistent with how serious mental illness is defined in both services for and research with persons who have serious mental illness (1, 54, 55).

Further, only two studies examined how intermediate targets corresponded to subsequent recidivism (38, 49). Consequently, it is unclear whether some critical program elements had an impact on this outcome. Future research should evaluate how intermediate treatment gains correspond to long-term criminal justice outcomes to elucidate the “black box” of treatment components and to distinguish effective from ineffective programs (56).

CONCLUSIONS

This review highlights several important areas that necessitate consideration in future research. RCTs are needed to examine the efficacy of interventions delivered to justice-involved persons with serious mental illness. Such studies should incorporate standardized measures that allow for comparison of findings across studies and should use follow-up periods that allow for assessments at multiple time points to better understand how changes in treatment targets are related to subsequent recidivism. Moreover, additional research is needed to understand the impact of interventions targeting criminogenic risks in community settings, which have been identified as a promising yet underdeveloped focal point for services for justice-involved persons with serious mental illness (57).

Future research should also strive to provide more detail regarding the racial-ethnic composition of study samples and whether these samples are representative of their target populations. These details could help researchers and practitioners better understand how study findings may be applied to different populations. Along with these efforts, more studies should be conducted among women, who represent one of the fastest-growing correctional populations. Estimates have found that as many as 43% of women in jail meet lifetime criteria for a serious mental illness (58), suggesting an urgent need for future research exploring the responsiveness of interventions targeting criminogenic risk factors in this population.

The results of this review show that a growing number of interventions targeting criminogenic risk factors are being adapted for use among justice-involved persons with serious mental illness and reveal promising outcomes associated with these interventions. Given the overrepresentation of individuals with serious mental illness in the criminal justice system, these findings provide an important step toward understanding the services that most effectively curb criminal justice involvement in this population. To this end, this review helps organize and provide direction for future research on the use of interventions that target criminogenic risk factors among persons with serious mental illness.

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