Effectiveness of Mental Health Courts in Reducing Recidivism: A Meta-Analysis

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Objective: Mental health courts (MHCs) were developed to address the overrepresentation of adults with mental illnesses in the U.S. criminal justice system through diversion into community-based treatment. Research on MHCs has proliferated in recent years, and there is a need to synthesize contemporary literature on MHC effectiveness. The authors conducted a meta-analytic investigation of the effect on criminal recidivism of adult MHC participation compared with traditional criminal processing.

Methods: Systematic search of three databases yielded 17 studies (N=16,129) published between 2004 and 2015. Study characteristics and potential moderators (that is, publication type, recidivism outcome, and length and timing of follow-up) were independently extracted by two of four raters for each study. Two raters coded each study for quality and extracted between-group effect sizes for measures of recidivism (that is, arrest, charge, conviction, and jail time; k=25). Results were synthesized by using random-effects meta-analysis. Heterogeneity and publication bias were also assessed.

Results: Results showed a small effect of MHC participation on recidivism (d=−.20) relative to traditional criminal processing. MHCs were most effective with respect to jail time and charge outcomes compared with arrest and conviction, in studies measuring recidivism after MHC exit rather than at entry, and in lower-quality studies compared with moderate- and high-quality studies. Results showed significant heterogeneity in effect sizes across studies (I^2=73.33) but little evidence of publication bias.

Conclusions: Overall, a small effect of MHC participation on recidivism was noted, compared with traditional criminal processing. Findings suggest the need for research to identify additional sources of variability in the effectiveness of MHCs.

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Mental health courts (MHCs) were developed in the late 1990s to address growing numbers of adults with mental illnesses in the U.S. criminal justice system (1,2). These courts operate primarily as postbooking diversion programs whereby defendants voluntarily agree to judicial supervision of community-based mental health treatment, often in exchange for a reduced or dismissed index charge upon successful completion. MHCs may help reduce high rates of reoffending in this population (3). Although MHCs vary in their design (4), case processing (for example, proportion of referred cases accepted and time from referral to acceptance) (5), and selection of participants (6), they share several defining features. These include a separate docket (list of cases heard in court), judicial supervision of treatment plans, regular appearances of participants before the judge, and terms of participation for successful completion (for example, demonstrated treatment adherence) (7). Over the past 20 years, MHCs have spread rapidly, and there are now nearly 350 MHCs in the United States (8).

A key question is whether MHCs are effective in reducing reoffending among justice-involved adults with mental illnesses. Past studies have shown effects of MHC participation on arrests (9–12), charges (13), and jail days (14,15). Other studies have failed to find effects of MHC participation on recidivism (16–18). A prior meta-analytic investigation examined 15 quasi-experimental and single-group studies published through July 2009, finding a positive effect, moderate in size, on recidivism (Hedges' g=−.55) (19). However, this study also revealed evidence of publication bias (that is, published papers presented significant findings in favor of the MHC) and a high degree of heterogeneity across effect sizes. Together, findings to date suggest considerable variability in the effectiveness of MHCs.

Beyond variations in the structure and operation of MHCs, methodologies used to evaluate them may explain mixed findings. Some studies have examined recidivism after participants' enrollment in the MHC (12,15,16,18), whereas others have measured recidivism after MHC exit (13,14,17,20–22). In addition, length of follow-up has varied across studies, with few studies measuring recidivism longer than 12 months (13,15,16,18). Furthermore, the methodological quality of designs with nonequivalent comparison groups has varied significantly on key indicators, such as composition of the comparison group, use of matching strategies, and reporting

of confidence intervals. For these reasons, investigation of study-level characteristics may elucidate between-study variability and explain inconsistent findings regarding MHC effectiveness.

Since 2009, there has been considerable growth in the research literature on MHCs, including two multisite investigations (15,18) and several investigations employing comparison groups to examine the effectiveness of MHC participation compared with treatment as usual (11,14,15,17,18,22). As a result, there is a need to reexamine the contemporary literature on the effect of MHCs on recidivism. We conducted a meta-analytic investigation of the effectiveness of MHCs in reducing reoffending among adults with mental illnesses. Our aims were to establish the effect of MHC participation on criminal recidivism compared with treatment as usual and then to identify moderators of these effects, such as study quality and length and timing of follow-up.

METHODS

We followed the PRISMA guidelines (23,24) for reporting of inclusion criteria, assessment of publication bias, and synthesis of results.

Literature Search

Three primary inclusion criteria guided our literature search: first, the intervention was identified as an MHC for adults (as opposed to youths); second, recidivism was included as a dependent variable, operationalized as any continuous or dichotomous measure of arrest, criminal charge, conviction, or time in jail for a specified follow-up period; and third, the study included a comparison group. We conducted a systematic literature review in PsycINFO, Google Scholar, and National Criminal Justice Reference Service Abstracts using the key word "mental health court." The initial search identified 2,769 records. [A flowchart illustrating the search process is presented in an online supplement to this article.] An additional ten records were identified through reference review. Abstracts were screened by two members of the study team (EL and DB) to determine whether the study identified the intervention as an MHC, represented an empirical investigation, reported on an MHC participant-level outcome, and was published between January 1, 1995, and December 31, 2015. These criteria produced 75 unique records for full-text evaluation by two members of the study team (DB and BN) against primary inclusion criteria. Among eligible studies, we excluded one record for which information to compute a between-groups effect size could not be obtained (25) and 11 records of duplicate samples. As a quality control measure for our initial search, we replicated our original search criteria in PubMed (80 records) and LexisNexis (77 records). We also replicated our PsycINFO search using identical search constraints and several additional search terms: "diversion program*" (327 records), "problem-solving court*" (64 records), and "alternative to incarceration" (50 records). Review of these records yielded no new records meeting inclusion criteria. Records for which effect sizes could be extracted by sample (that is, a specific MHC and jurisdiction) were treated as separate studies. A total of 16 records representing 17 unique studies were included in the meta-analysis (11–18,20–22,26–30).

Data Extraction

Two of four trained coders (EL, DB, ES, and KD) independently extracted the following data for each study: year of publication, composition of comparison group, MHC location (city, county, and state), dates of data collection, publication type (dissertation, publication, or report), recidivism outcome (arrest, charge, conviction, or jail), length of follow-up (12 months or >12 months), timing of follow-up (after MHC exit, after MHC enrollment, or after MHC referral), and sample characteristics overall and by group (percentage male, mean age, and percentage white). Excellent levels of agreement were achieved across categories (90.0% agreement). Discrepancies were resolved through discussion with the first author.

Because of the high risk of bias and a shortage of instruments of suitable quality for use in nonrandomized and retrospective investigations (31), we assessed study quality by using two measures: the SIGN Methodology Checklist 3 for Cohort Studies (32) and the Quality Assessment Tool (QAT) for Quantitative Studies (33). These were adapted to capture relevant methodological indicators and to generate quality ratings of low, moderate, or high. Each study was coded and scored independently on both measures by two authors (EL and CR). SIGN and QAT ratings showed strong evidence for convergent validity (r=.75, p=.001), corresponding to a large effect size (34). Interrater reliability was excellent for the SIGN framework (κ=.80; 87.5% agreement) and fair for the QAT framework (κ=.39; 62.5% agreement) (35). Average ratings across both frameworks produced an excellent level of interrater reliability (intraclass correlation coefficient=.91) (36).

Between-groups effects on recidivism (k=25) were extracted and coded with a consensus approach by two authors (EL and CR). Effect size direction was standardized such that negative effects represented lower recidivism for MHC participants relative to comparison group participants. Consistent with our operationalization of recidivism, effect sizes were first extracted for continuous measures (that is, arrests, charges, convictions, and jail days). If it was not possible to code continuous outcomes, effect sizes from dichotomized measures of recidivism were coded (that is, any arrest, charge, conviction, or jail time). All effect sizes were coded consistent with quality ratings and an intent-to-treat approach (37). For most effect sizes (k=19), sufficient information was provided to calculate a standardized mean difference (d). For studies that did not report a within-subjects correlation, we used an estimated correlation of r=.50, which we deemed conservative on the basis of published estimates in the literature (25). For all other effect sizes (k=6), odds ratios were coded and d estimated in

Comprehensive Meta-Analysis (CMA) software, version 3 (38). For studies reporting rate ratios (N=2, k=4), we recorded odds ratios for dichotomous outcomes to allow inclusion of all effect sizes. When separate effect sizes were presented for MHC completers and noncompleters (N=2 studies), effect sizes were coded separately (k=3) and aggregated.

Data Analysis

Analyses were conducted by using a random-effects model (39) because of known variability in the design and operation of MHCs (4–6). The random-effects model accounts for variability in the intervention- and study-level characteristics as well as sampling (40). Standardized mean difference (d) effect sizes were calculated for each study, weighted by inverse variance, and aggregated to produce weighted mean effect sizes. When multiple effect sizes were extracted for a single study, effect sizes were averaged across studies to minimize bias from correlated outcomes (41). Heterogeneity was assessed with Cochran's Q statistic, indicating the presence of heterogeneity, and with I^2, approximating the amount of heterogeneity (42,43). I^2 values of 25%, 50%, and 75% represented low, moderate, and high heterogeneity (44). We tested four study-level moderators: study quality, recidivism outcome, length of follow-up, and timing of follow-up.

To assess publication bias, we examined publication type as a potential moderator. We then examined a funnel plot of standard errors from random effects (45), which provides a graphical representation of publication bias based on asymmetry across the vertical axis (46). Because the funnel plot interpretation is subjective (47), we conducted the "trim and fill" method, which quantifies and adjusts for funnel plot asymmetry and provides a corrected effect size (48), and computed a fail-safe N, which estimates the number of additional studies with a nonsignificant intervention effect needed to nullify the effect size (that is, to raise the p value above .05) (49). All analyses were conducted in CMA software, version 3 (38).

RESULTS

Study and Sample Characteristics

A total of 17 studies of 16,129 participants were published between 2004 and 2015. Study characteristics are presented in Table 1. Most studies were from peer-reviewed publications (N=11, 65%) rather than dissertations (26) and reports (both N=3, 18%). Most studies were rated as high quality (N=8, 47%), with fewer of moderate (N=5, 29%) and low (N=4, 23%) quality. Arrest was the most frequently investigated recidivism outcome (N=12, 70%), followed by jail (N=6, 35%), conviction (N=5, 29%), and charge (N=2, 12%). Recidivism was more frequently measured over a 12-month period (N=11, 65%) than over a period longer than 12 months (N=6, 35%). Follow-up periods typically began after MHC enrollment (N=9, 53%) or after MHC exit (N=7, 41%). Sample characteristics are presented in Table 2. For one multisite investigation, sample-level effect sizes could not be computed and, consequently, aggregated descriptive statistics are provided (15). Across samples, participants were on average in their mid-30s and most were male. However, racial composition varied widely across studies.

Effect Sizes

Pooled effect sizes are presented in Table 3. Results showed a significant, negative, and small effect of MHC participation on recidivism (d=–.20, 95% confidence interval [CI]=–.29 to –.10, $p<.001$). In addition, there was significant heterogeneity in this effect (Q=60.00, $p<.001$, $I^2=73.33$), suggesting the presence of a high degree of variability in effect size across studies (44). Because high-quality nonrandomized investigations may produce effect sizes similar to those of randomized controlled trials (RCTs) (50), we included the single RCT investigation in our overall effect size. Exclusion of the RCT study did not change the direction, magnitude, or significance of results (d=–.22, CI=–.31 to –.13, $p<.001$).

Moderator analyses showed that low-quality studies produced significant effects of MHC participation on recidivism (d=−.35, CI=–.57 to –.13, p=.002). Moderate- and high-quality studies produced only trending effects (p values ≥.054). A follow-up length of 12 months produced effects (d=–.19, CI=–.33 to –.06, p=.004) similar to those of longer follow-up periods (d=–.19, CI=–.34 to –.03, p=.016). However, studies that measured recidivism after MHC exit (d=–.26, CI=–.37 to –.15, $p<.001$) versus after enrollment (p=.058) showed stronger effects on recidivism. For recidivism outcome, we found significant effects of MHC participation on charge (d=–.36, CI=–.52 to –.20, $p<.001$) and jail time (d=–.36, CI=–.54 to –.19, $p<.001$) but not on arrest or conviction (p values ≥.161).

Follow-up analysis by both recidivism outcome and timing of follow-up showed a significant effect of MHC participation on arrest when measured after MHC exit (d=–.18, CI=–.29 to –.07, p=.002) but not after enrollment (p=.667). Furthermore, the effect of MHC participation on jail time was stronger when measured after exit (d=–.42, CI=–.68 to –.16, p=.002) versus after enrollment (d=–.38, CI=–.74 to –.03, p=.035).

For publication bias, moderator analyses by publication type showed that dissertations (d=–.33, CI=–.56 to –.10, p=.006) yielded stronger effects than peer-reviewed publications (d=–.18, CI=–.32 to –.05, p=.008) and reports (d=–.12, CI=–.22 to –.03, p=.013). Visual inspection of the funnel plot showed little asymmetry and no studies in the lower quadrant of the plot, providing limited evidence of publication bias. This was confirmed by Duval and Tweedie's (48) trim-and-fill method, which resulted in identical observed and adjusted estimates. Similarly, results of the fail-safe N showed that an additional 264 studies would be needed to nullify the significant effect of MHC participation on recidivism found in this analysis (49). Taken together, findings showed little evidence of publication bias.

TABLE 1. Characteristics of 17 studies included in a meta-analytic investigation of the effect on criminal recidivism of mental health court (MHC) participation

					Moderators							
									Recidivism outcome			
Study	Year	Comparison group	Location	Data collection	Publication type	Study quality	Length of follow-up (months)	Timing of follow-up	Arrest	Jail	Charge	Conviction
Anestis and Carbonell (28)	2014	In traditional court, with mental illness	Florida	2008–2010	Peer-reviewed publication	Moderate	12	After enrollment	✓			
Bagwell (26)	2013	In traditional court, denied participation	Riverside County, California	2006–2012	Dissertation	Low	12	After enrollment	✓			
Christy et al. (27)	2005	In traditional court, with mental illness	Broward County, Florida	1999–2001	Peer-reviewed publication	Moderate	12	After enrollment	✓			
Cosden et al. (16)	2005	Referred to MHC and randomly assigned to control group	California	Pre–2005	Peer-reviewed publication	High	>12	After enrollment	✓	✓		✓
Dirks-Linhorst and Linhorst (17)	2010	Referred and opted out of MHC	St. Louis County, Missouri	2001–2008	Peer-reviewed publication	Low	12	After exit	✓			
Ferguson et al. (20)	2008	In traditional court, not referred to MHC	Anchorage Municipality County, Alaska	2003–2007	Report	Moderate	12	After exit	✓			
Frailing (21)	2010	Referred and opted out of MHC	Washoe County, Nevada	2006–2009	Peer-reviewed publication	Moderate	12	After exit		✓		
Hiday et al. (11)	2013	MHC-eligible, receiving comparable services	Washington, D.C.	2007–2009	Peer-reviewed publication	High	12	After exit	✓			
Kubiak et al. (22)	2015	MHC-eligible, not enrolled	Wayne County, Michigan	2009–2013	Peer-reviewed publication	Low	12	After exit	✓	✓		
Lowder et al. (14)	2016	In traditional court, with mental illness	Ramsey County, Minnesota	2005–2008	Peer-reviewed publication	High	12	After exit		✓	✓	✓
McNiel and Binder (13)	2007	In jail, with mental illness	San Francisco County, California	2003–2005	Peer-reviewed publication	High	>12	After exit			✓	
Moore and Hiday (12)	2006	In traditional court, with mental illness, MHC eligible	County in North Carolina	1998–2002	Peer-reviewed publication	High	12	After enrollment	✓			
Morin (29)	2004	In diversion services	Hennepin County, Minnesota	2002–2004	Dissertation	Moderate	12	After referral		✓		
Roman (30)	2011	In traditional court, with mental illness, ineligible for MHC or opted out	Sacramento County, California	2007–2010	Dissertation	Low	>12	After enrollment				✓
Rossman et al. (18)	2012	In jail, with mental illness	Bronx County, New York	2002–2006	Report	High	>12	After enrollment	✓			✓
Rossman et al. (18)	2012	In jail, with mental illness	Kings County, New York	2002–2006	Report	High	>12	After enrollment	✓			✓
Steadman et al. (15)	2011	MHC-eligible, not referred or never rejected	Hennepin County, Minnesota; San Francisco County and Santa Clara County, California; Marion County, Indiana	2005–2008	Peer-reviewed publication	High	>12	After enrollment	✓	✓		

TABLE 2. Characteristics of samples in 17 studies included in a meta-analytic investigation of the effect on criminal recidivism of mental health court (MHC) participation[a]

				MHC group					Comparison group				
					Male	Age		White		Male	Age		White
Study	Year	k	N[b]	N	(%)	M	SD	(%)	N	(%)	M	SD	(%)
Anestis and Carbonell (28)	2014	1	396	198	69	36.42	12.47	48	198	74	35.45	11.21	50
Bagwell (26)	2013	1	901	610	34	36.2	10.4	33	291	24	nr		31
Christy et al. (27)	2005	1	217	116	66	36.4	10.4	68	101	60	37.66	9.63	58
Cosden et al. (16)	2005	3	235	137	49	nr		71	98	52	nr		71
Dirks-Linhorst and Linhorst (17)	2010	1	577	488	nr	nr		nr	89	nr	nr		nr
Ferguson et al. (20)	2008	1	436	218	64	nr		52	218	nr	nr		nr
Frailing (21)	2010	1	551	313	54	nr		84	238	59	nr		83
Hiday and Wales (11)	2013	1	1,095	408	50	41.4	11.0	90	687	63	40.7	11.6	93
Kubiak et al. (22)	2015	2	150	105	69	nr		48	45	84	37.2	12.3	47
Lowder et al. (14)	2016	3	97	57	46	34.5	9.6	35	40	53	36.05	9.55	38
McNiel and Binder (13)	2007	1	8,237	170	74	37.3	11.0	32	8,067	78	37.9	11.0	41
Moore and Hiday (12)	2006	1	265	82	68	35.65	nr	61	183	73	30.08	nr	45
Morin (29)	2004	1	102	51	80	39.8	13.7	53	51	nr	29.04	9.12	22
Roman (30)	2011	1	89	43	65	36.93	11.25	54	46	83	38.4	12.0	26
Rossman et al. (18)	2012	2	1,128	564	62	36.79	nr	7	564	61	36.93	nr	7
Rossman et al. (18)	2012	2	606	303	76	34.8	nr	38	303	78	35.4	nr	41
Steadman et al. (15)[c]	2011	2	1,047	447	58	37.5	nr	57	600	63	36.6	nr	59

[a] nr, statistic not reported or could not be calculated for group
[b] Refers to total study sample size. Actual sample size for individual effect sizes (k) may vary.
[c] Effect sizes could not be coded for site-level data.

DISCUSSION

MHCs have grown more prevalent across the United States in the past decade (8). Although they are generally accepted as one strategy to reduce the overrepresentation of adults with mental illness in the criminal justice system, they are not without controversy (51–55). For instance, MHCs have been criticized as potentially obstructing defendants' due process rights (51,55,56). They also have been called a stopgap for pervasive, structural problems, such as stigma related to mental illness or inadequate community mental health resources (52,54). As a result of these critiques, questions remain regarding their effectiveness. We conducted a meta-analytic investigation of studies examining the effectiveness of MHC participation on recidivism relative to treatment as usual. We also examined the extent to which study-level factors attenuated effectiveness.

Overall, our findings indicate that MHC participation had a modest effect on recidivism relative to traditional criminal processing (d=–.20). Because we employed a strict intent-to-treat approach, this finding likely represents a conservative estimate (57). Specifically, previous research has demonstrated that graduation from an MHC, as opposed to participation more generally, is associated with better outcomes (14,58). However, in practice, not every participant who enrolls in an MHC will graduate. Rather than speaking to the effectiveness of successful participation in an MHC, our findings inform the overall effectiveness of MHCs as a judicial strategy to reduce the number of adults with mental illnesses who are returning to the criminal justice system.

Our findings suggest a need for research examining strategies (for example, more frequent status hearings and intensive case management) to encourage participant engagement in MHCs. Indeed, there has been limited investigation of features of MHC participation beyond graduation status that may contribute to reduced recidivism (59–61). Furthermore, addressing the criminogenic risks and needs (for example, financial resources, housing, and procriminal attitudes) of MHC participants may contribute to greater reductions in recidivism (62), although the extent to which these criminogenic risks and needs are addressed in MHC case management and supervision is unknown.

Individual studies have produced significant effects of MHC participation on conviction and arrest outcomes. However, results from moderator analyses showed small effects of MHC participation on either outcome, especially when measured after MHC enrollment. Rather, MHC participation appeared to be most effective at decreasing jail time after exit from the MHC. These findings suggest that MHCs may be most effective as a harm reduction intervention. Specifically, given the already high rates of reoffending in this population (3), it may not be realistic to expect complete desistance from criminal activity among MHC participants. Rather, MHC participation may be a means to mitigate the severity of future offending (that is, jail time associated with a new offense).

Length of follow-up did not moderate the effect of MHC participation, suggesting sustained reductions in recidivism over time. To date, only one study has examined long-term recidivism outcomes, finding that 53.9% of participants were rearrested in a five-year period (58). However, that study did not include a comparison group of offenders undergoing traditional criminal justice processing. We also found stronger effects when recidivism was measured after exit

TABLE 3. Effect sizes for the effectiveness of mental health courts on recidivism in a meta-analysis of data from 17 studies

Effect size	k[a]	Total N[b]	d	SE	95% CI[c]	Z	$Q_{(k-1)}$[d]	I^2[e]
Overall	17	16,036	−.20	.05	−.29 to −.10	−3.96***	60.00***	73.33
By recidivism								
Arrest	12	7,025	−.10	.07	−.23 to .04	−1.40	66.17***	83.38
Charge	2	8,334	−.36	.08	−.52 to −.20	−4.48***	.61	<.01
Conviction	5	2,127	−.11	.10	−.32 to .09	−1.10	13.83**	71.08
Jail	6	2,089	−.36	.09	−.54 to −.19	−4.03***	16.18**	69.09
By study quality								
Low	4	1,717	−.35	.11	−.57 to −.13	−3.14**	9.06*	66.90
Moderate	5	1,637	−.20	.10	−.40 to .01	−1.90†	15.84**	74.74
High	8	12,682	−.13	.07	−.26 to .002	−1.92†	27.26***	74.32
By length of follow-up								
12 months	11	4,722	−.19	.07	−.33 to −.06	−2.91**	37.54***	73.35
>12 months	6	11,314	−.19	.08	−.34 to −.03	−2.41*	21.57**	76.82
By timing of follow-up								
After enrollment	9	4,856	−.15	.08	−.30 to .005	−1.90†	45.72***	82.50
After exit	7	11,078	−.26	.06	−.37 to −.15	−4.66***	11.44†	47.57
By publication type								
Peer-reviewed publication	11	12,774	−.18	.07	−.32 to −.05	−2.65**	44.85***	77.70
Report	3	2,170	−.12	.05	−.22 to −.03	−2.49*	2.28	12.41
Dissertation	3	1,092	−.33	.12	−.56 to −.10	−2.77**	3.52	43.18

[a] Number of effect sizes
[b] Pooled sample size for mean effect sizes. When specific sample sizes for analyses were not reported in the original study, the study sample size was used.
[c] For mean effect size
[d] Chi-square homogeneity test
[e] Degree of heterogeneity
*p<.05, **p<.01, ***p<.001, †p<.10

from the MHC versus after enrollment, which may reflect the intensive community monitoring of MHC participants and the widespread practice of using jail as a sanction for noncompliance (4,63).

Our findings raise a broader question regarding the types of improvements MHC participants should be expected to make during—and after—MHC participation. Future MHC research should adapt practices from an implementation science framework to examine the extent to which MHCs achieve key service outcomes—such as service referrals and engagement—and the extent to which these outcomes contribute to participant outcomes, such as improved psychosocial functioning and decreased recidivism (64). These investigations are critical to understanding how MHCs operate, what contributes to their effectiveness, and the extent to which short-term gains in treatment and service utilization result in long-term improvements in community functioning.

Finally, although we found limited evidence of publication bias, we observed a moderating effect of study quality, with lower-quality studies yielding higher effect sizes. Of note, few RCTs have been conducted in MHCs (16). Although some concerns have been raised regarding the use of RCTs to evaluate MHCs for reasons of procedural fairness (27), RCTs have been used successfully to evaluate other diversion strategies, including drug courts (65). Our findings highlight the need for increased rigor in evaluations of MHCs, including improved measurement of recidivism and use of appropriate analytic strategies (66). For example, the dichotomization of recidivism measures (for example, any arrest: yes, no) has the potential to restrict response range and to bias results (67). When count variables are used (for example, number of arrests), their distributional properties must be assessed prior to analysis. Although a growing number of studies have employed Poisson-class regression (for example, negative binomial, Poisson, and zero-inflated models) to model count data, effect sizes are not consistently reported.

Our findings should be considered along with several limitations. First, our literature search focused on published studies and reports conducted by external researchers. We did not include data resulting from internal evaluations, which may have excluded potential data sources. Nevertheless, our findings showed little evidence of publication bias. In addition, when means and standard deviations were used to calculate standardized mean differences, rarely could we determine whether distributions of recidivism variables met normality assumptions. When studies reported proper effect sizes for Poisson-class models (that is, incidence rate ratios), these could not be included in the meta-analysis because of our use of the standardized mean difference. Instead, we coded odds ratios from comparisons of dichotomous outcomes, reducing effect sizes for two studies (12,14). Finally, we could not investigate participant-level sources of effect size variability because of inconsistent reporting across studies, and although we investigated study-level moderators, we were unable to use meta-regression strategies to quantify these effects. These are important directions for future research.

CONCLUSIONS

Our findings support the effectiveness of MHCs in reducing recidivism but also highlight important directions for future research. In particular, although more methodologically rigorous research on the effectiveness of MHCs is needed, there is perhaps a greater need for research into the mechanisms through which MHCs contribute (or not) to reductions in

recidivism. Few studies have examined components of MHCs associated with improved participant outcomes, which is likely attributable to the limited knowledge of how MHCs operate across sites. However, examining variability in the design and operation of U.S. MHCs is critical to informing recommendations to improve their effectiveness.

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