



# The Effectiveness of Mental Health Courts in Reducing Recidivism and Police Contact: A Systematic Review

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## Abstract

Mental health courts were created to help criminal defendants who have a mental illness that significantly contributes to their criminal offense. The purpose of this systematic literature review is to assess the current evidence to address the question, “How effective are mental health courts in reducing recidivism and police contact?” Systematic literature searches of eight electronic databases were performed. A total of 2590 unique citations were identified. Of these, 20 studies were included in the final analysis. The results of this systematic review suggest there is some evidence to show that mental health courts help to reduce recidivism rates, but the effect on police contact is less clear. Results also suggest case managers or access to vocational and housing services may be important components of effective mental health courts.

**Keywords** Mental health courts · Recidivism · Rearrest · Justice system · Police contact · Mental illness

## Abbreviations

ACT Assertive community treatment  
FACT Forensic assertive community treatment  
MHC Mental health court  
PRESS Peer review of electronic search strategies

PRISMA Preferred reporting items for systematic reviews and meta-analyses  
TAU Treatment as usual  
TCC Traditional criminal court

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## Introduction

In the mid 1990’s, courts across Canada and the United States reported significant increases in the number of defendants with mental illness entering the criminal court system (Schneider 2010; Schneider et al. 2007). In some jurisdictions, this increase has been in excess of 10% per year (Schneider et al. 2007). As a response to this growing problem, mental health courts (MHC) were created to help criminal defendants who do not meet not-guilty-for-reason-of-insanity criteria, but who have a mental illness that is a significant contributing factor to their arrest (Desmond and Lenz 2010).

MHC diversion programs are characterized by three key components: screening, assessment, and negotiation between court diversion and criminal justice staff (Steadman et al. 1994). Screening involves the identification of defendants who are suspected of having a mental illness. Assessment involves the evaluation of identified defendants by a mental health professional. The last component involves court diversion staff negotiating with prosecutors, defence attorneys, the courts and community-based mental health providers to

work towards having charges reduced or even waived (Steadman et al. 1994). Although the number of MHCs continues to increase across North America and abroad, data have only begun to emerge in the past decade suggesting that MHCs reduce recidivism and improve client outcomes (Schneider 2010; Schneider et al. 2007).

## Purpose

MHCs were created to help address the increasing problem of defendants with mental illnesses entering the court system (Desmond and Lenz 2010). A systematic review of the literature was conducted to look at the current evidence on the effectiveness of MHCs with respect to recidivism and police contact. This review addresses the question: ‘How effective are MHCs in reducing recidivism and police contact?’.

## Previous Reviews and Rationale for this Review

Although systematic reviews on MHCs have been published, with 2011 and 2015 being the most recent (Honegger 2015; Lange et al. 2011; Sarteschi et al. 2011), there are several limitations with these three previous reviews that this systematic review will address.

First, this systematic review reports on the current evidence on the effectiveness of MHCs by collecting data on peer-reviewed studies up until April 2017. The 2011 reviews by Sarteschi et al. (2011) and Lange et al. (2011) are based on data collected up until July 2009 and January 2011, respectively. The 2015 paper by Honegger (2015) is limited to data collected up to August 2014.

Second, this review employed a more comprehensive search strategy than previous reviews. Specifically, this review followed the *Peer Review of Electronic Search Strategies* (PRESS) guidelines (McGowan et al. 2016). For example, this review used truncated word search commands and database specific adjacency operators that were not used by previous reviews. Truncated search commands broaden a search strategy to comprehensively search with key words in a single command as opposed to the multiple search commands required to account for variations of spelling. Plural forms of key words are often missed when truncation is not used. Adjacency commands, on the other hand, help to look for a string of words that are within a specified number of words apart. Using both truncation and adjacency commands concurrently decreases the likelihood a given search strategy will overlook relevant articles.

Last, this review did not impose geographical search limitations. Previous reviews focused on specific geographical locations, such as North America (Lange et al. 2011) or the United States (Honegger 2015). Given MHCs exist in many jurisdictions around the world (Schneider 2010), geographical restrictors were not used.

## Methods

This systematic literature review is reported following the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) guidelines (Additional file 1) (Moher et al. 2009). Because this review only uses publically available information, Research Ethics Board approval was not required. The protocol for this systematic review was registered on PROSPERO (CRD42016036084) and has been published elsewhere (Loong et al. 2016).

## Eligibility Criteria

For the purposes of this review, *MHCs* were defined as specialized courts dedicated to persons with serious mental illness who have committed a crime (Schneider et al. 2007). *Court support services* were defined as services provided to clients to help navigate the court system and utilize mental health services (Ministry of Health and Long-Term Care 2006). *Recidivism* was defined as rearrests and *police contact* was defined as any kind of client involvement with police in the community for suspected violations of the law by the client (as opposed to contacts resulting from being a victim of a crime).

The following eligibility criteria were used to screen for relevant peer-reviewed articles:

1. The study reports on a MHC(s)
2. The study reports on adults (18 years or older) with mental disorders who have been charged for committing a crime
3. The study reports program outcome measures on recidivism and/or police contact
4. There is a comparison group

The following exclusion criteria were used:

1. The study reports only on juvenile courts
2. The study reports solely on drug courts
3. The study population does not have identified mental disorders
4. There are no outcome measures reported
5. There is no comparison group
6. The article is not reporting on original research
7. The study is a qualitative study
8. The study only re-reports findings from an already included publication by the same author(s) using the same dataset

## Search Strategy

### Electronic Databases

In consultation with a professional health science librarian, eight electronic databases were identified and searched for this systematic review (Loong et al. 2016):

1. *PsycINFO* (an index of journal articles, books, chapters, and dissertations in psychology, social sciences, behavioral sciences, and health sciences)
2. *Medline* (an index of biomedical research and clinical sciences journal articles)
3. *Medline In-Process/E-Pub Ahead of Print* (an index of biomedical research and clinical sciences journal articles and abstracts awaiting to be indexed into Medline)
4. *Embase* (an index of biomedical research, and abstracts from biomedical, drug and medical device conferences)
5. *Web of Science* (an index of journal articles, editorially selected books and conference proceedings in life sciences and biomedical research)
6. *CINAHL* (an index of journal articles, books, dissertations, and conference proceedings in nursing, biomedicine, health sciences librarianship, alternative medicine, consumer health and allied health disciplines)
7. *Social Work Abstracts* (an index of abstracts in social work and human services)
8. *Criminal Justice Abstracts* (an index of abstracts in criminal justice and criminology)

Following PRESS guidelines (McGowan et al. 2016) and consulting with a professional health science librarian (SB), search strategies were developed and tailored to each of the above databases. Searches were executed in April 2017. *Medline*, *Medline In-Process/E-Pub Ahead of Print*, *PsycINFO*, *Embase*, and *Social Work Abstracts* were searched using the OVID platform. *Web of Science* was searched using the Thomson Reuters search interface. Lastly,

*CINAHL* and *Criminal Justice Abstracts* were searched using the EBSCO platform. Across all databases, search results were limited to English language journals and published articles in peer-reviewed journals whenever possible. Search results were not limited by publication year. The final search strategies for each of the databases are included in Tables 1, 2 and 3.

### Study Selection

A multi-phase screening process was used to identify relevant search hits using the eligibility criteria discussed previously. Phase 1 involved screening articles by title. Citations that passed the first phase were then evaluated for relevance based on their abstracts. The full text articles that passed the first and second screening were evaluated for content. The entire multi-phase screening process was done independently by two reviewers (DL and CSD). Using Cohen’s kappa coefficient ( $\kappa$ ) that was corrected for chance (Cohen 1960), the inter-rater reliability between both raters was calculated to be  $\kappa = 0.80$ .

Articles with rating disagreements were discussed until a consensus was reached. The reference lists of all accepted studies were also hand searched. Articles identified through

**Table 1** OVID search strategy (*Medline*, *Medline In-Process/E-Pub Ahead of Print*, *PsycINFO*, *Embase*, and *Social Works Abstract*)

Search terms	
1.	(mental\$ adj3 health\$ adj3 court\$).mp.
2.	(mental\$ adj3 health\$ adj3 justice\$).mp.
3.	(mental\$ adj3 ill\$ adj3 court\$).mp.
4.	(mental\$ adj3 ill\$ adj3 justice\$).mp.
5.	(court\$ adj3 diversion\$).mp.
6.	(jail\$ adj3 diversion\$).mp.
7.	(post\$ adj3 booking\$ adj3 diversion\$).mp.
8.	1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7

\$ Database specific truncation search command

**Table 2** Thomson Reuters search strategy (*Web of Science*)

Search terms	
1.	mental* NEAR/3 health* NEAR/3 court*
2.	mental* NEAR/3 health* NEAR/3 justice*
3.	mental* NEAR/3 ill* NEAR/3 court*
4.	mental* NEAR/3 ill* NEAR/3 justice*
5.	court* NEAR/3 diversion*
6.	jail* NEAR/3 diversion*
7.	post* NEAR/3 booking* NEAR/3 diversion*
8.	1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7

\* Database specific truncation search command

**Table 3** EBSCO search strategy (*CINAHL* and *Criminal Justice Abstracts*)

Search terms	
1.	mental* N3 health* N3 court*
2.	mental* N3 health* N3 justice*
3.	mental* N3 ill* N3 court*
4.	mental* N3 ill* N3 justice*
5.	court* N3 diversion*
6.	jail* N3 diversion*
7.	post* N3 booking* N3 diversion*
8.	1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7

\* Database specific truncation search command

this process were subjected to the same multi-phase screening process and the same eligibility criteria.

### Risk of Bias Assessment

Articles that passed the three-stage screening process were assessed for risk of bias. A 7-item risk of bias checklist adapted from Cochrane (2011) and Dewa et al. (2015)'s Risk of Bias Assessment tool was used. This checklist evaluated the following:

1. *Adequate sequence generation* Group assignments of participants follow rules that are based on chance.
2. *Allocation concealment* Schedule of random assignments are kept concealed from personnel involved in study enrollment.
3. *Blinding* Participants and personnel are masked of the knowledge of which intervention was received.
4. *Incomplete outcome data* There is no significant difference between groups who withdraw from the study.
5. *Selective reporting* Study results are not selectively reported.
6. *Recruitment strategy* The recruitment process is open to all potential participants who meet the study eligibility criteria.
7. *Appropriate Statistics* Controlled for non-random assignment if necessary.

Each of the seven aforementioned criteria was given one of three possible scores:  $-1$  (if there was a high risk of bias),  $+1$  (if there was a low risk of bias) or  $0$  (if there was not enough information to assess risk). The minimum and maximum for any one article was  $-7$  and  $+7$ , respectively. Total scores of  $3$  and below were categorized as high risk of bias and scores between  $4$  and  $5$  points were considered as moderate risk. Articles that scored  $6$  points or above were rated as low risk of bias.

## Results

### Inclusion and Exclusion

This systematic review identified a total of 2590 unique citations (Fig. 1) based on a search of eight electronic databases. In the title and abstract screening phase, 2404 citations were excluded based on title and 104 were excluded based on abstract. This left 82 citations for full text review. Among the 82 full text articles reviewed, 62 were excluded for the following reasons: (1) not original research ( $n = 30$ ), (2) no outcomes measures reported ( $n = 22$ ), (3) no comparison group ( $n = 6$ ), (4) article not in English ( $n = 1$ ), and (5) not on a MHC ( $n = 3$ ). At the end of the multi-phase screening

process, 20 articles remained and their reference lists were hand searched for relevant articles. The hand search did not identify any additional citations that were relevant.

### Risk of Bias Assessment

When looking at the potential risk of bias, 17 studies (85%) were found to have a high risk and 3 studies (15%) were assessed to have moderate risk (Additional file 2). Due to the nature of the intervention, it was not possible to mask participants or study personnel regarding the knowledge of whether or not they were being processed in a MHC. Less than half of studies ( $n = 7$ ) reported or made comparisons between those who remained in the study and those who withdrew. It was also rare for studies to have a study protocol ( $n = 6$ ), and as a result, not enough information was available to assess if any outcomes were selectively reported. However, all included studies ( $n = 20$ ) had a recruitment strategy that was open to all potential participants who met study eligibility requirements. Figure 2 shows an overview of the potential risk for bias across studies.

### Overview of Included Studies

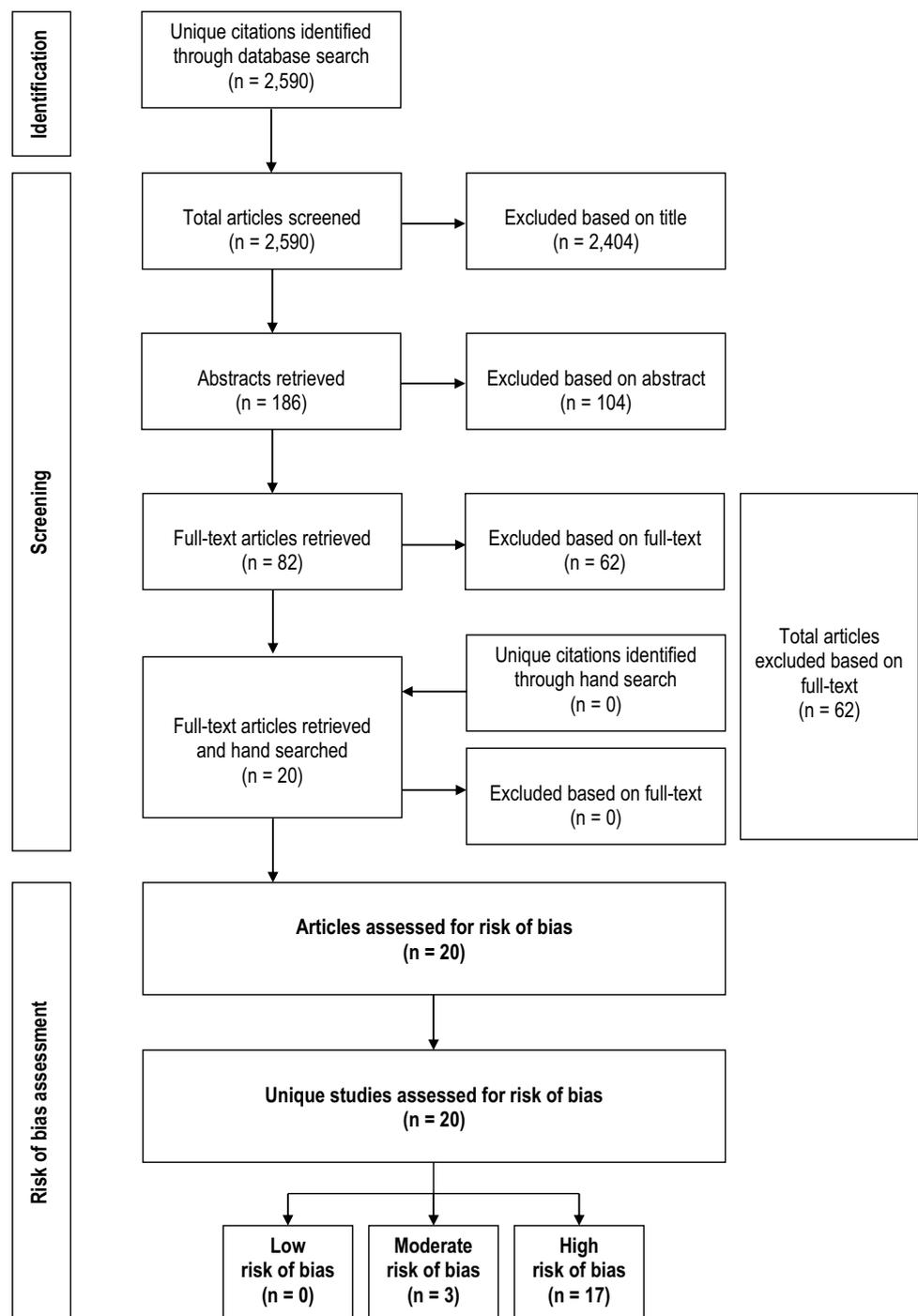
In total, 20 studies meet the inclusion criteria for this systematic literature review (Table 4). The vast majority of studies are from the US ( $n = 19$ ) and one is from Australia.

### Study Designs Used

In terms of study designs (Campbell and Stanley 1973), six studies employed a post-test only control group design. In this design, the treatment group and a similar control group are observed at follow-up only (Anestis and Carbonell 2014; Christy et al. 2005; Cosden et al. 2003; Lowder et al. 2016; McNeil and Binder 2007; Moore and Hiday 2006). Similar control groups were achieved either by randomization or by propensity score matching.

Four studies used a static group comparison design where the treatment group and a control group were observed at follow-up only (Burns 2013; Dirks-Linhorst and Linhorst 2012; Hiday et al. 2013, 2016). Another four studies used a one group pre-test post-test design (Gordon et al. 2006; Han and Redlich 2016; Herinckx et al. 2005; Trupin and Richards 2003). Although the study by Han and Redlich (2016) observed a MHC and treatment as usual (TAU) group pre- and post-test, there were no between group comparisons. As a result, this study essentially looked at two different groups in silo and therefore was considered to employ a one group pre-test post-test design.

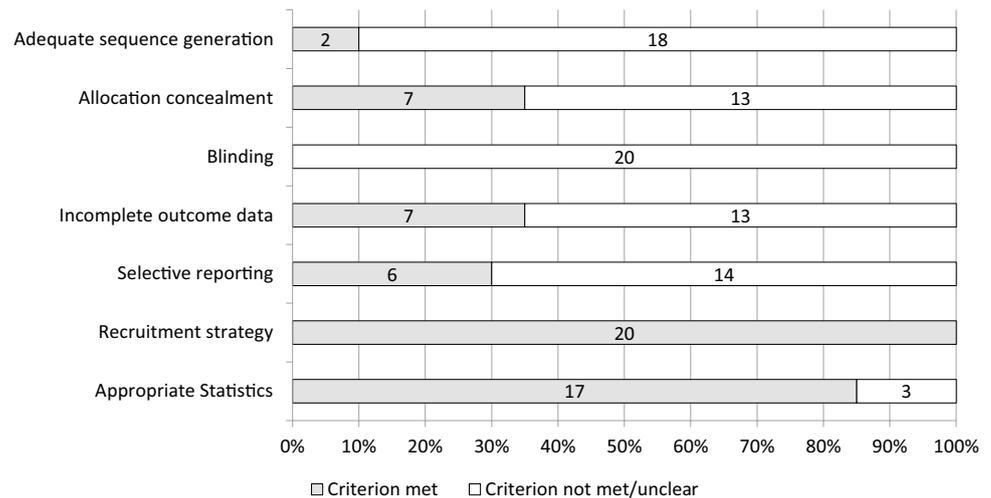
Among the remaining six studies, the study designs used included: multiple time series design ( $n = 3$ ) (Cusack et al. 2010; Shafer et al. 2004; Steadman and Naples

**Fig. 1** Flowchart of literature search results and inclusions/exclusions

2005), time series design (n = 1) (Cowell et al. 2004), pre-test post-test control group design (n = 1) (Steadman et al. 2011), and non-equivalent control group design (n = 1) (Lim and Day 2014). Furthermore, Cowell et al. (2004) was categorized as a time series design despite following three post-booking groups. Cowell et al. (2004) study was not considered a multiple time series study for several reasons. First, there was the absence of a control group time

series. And second, the analysis by Cowell et al. (2004) was strictly within group.

Overall, half of included studies (n = 10) (Anestis and Carbonell 2014; Christy et al. 2005; Cosden et al. 2003; Cusack et al. 2010; Han and Redlich 2016; Lowder et al. 2016; McNiell and Binder 2007; Moore and Hiday 2006; Steadman and Naples 2005; Steadman et al. 2011) used a matched control group that was achieved either through

**Fig. 2** Summary of risk of bias across studies

randomization or statistical control for variables such as sex, age, and diagnosis.

### Description of the Study Population

In terms of the study population, fourteen of the studies included MHC participants who had a severe mental illness (Anestis and Carbonell 2014; Christy et al. 2005; Cosden et al. 2003; Cusack et al. 2010; Dirks-Linhorst and Linhorst 2012; Han and Redlich 2016; Herinckx et al. 2005; Hiday et al. 2013, 2016; Lim and Day 2014; Lowder et al. 2016; McNiel and Binder 2007; Steadman et al. 2011; Trupin and Richards 2003) (i.e. schizophrenia, bipolar, major depression, and psychotic disorders). There were six studies (Burns 2013; Cowell et al. 2004; Gordon et al. 2006; Moore and Hiday 2006; Shafer et al. 2004; Steadman and Naples 2005) whose inclusion criteria included concurrent disorder individuals—that is, people who had a mental illness and a substance abuse problem. Across all 20 studies, MHC participants were charged for either misdemeanor or low-level felony offenses that carry sentences that range from fines, probation, rehabilitation, community service, or a maximum of 1 year in prison (University of Minnesota).

### Intervention and Comparison Groups

Across all 20 studies, the intervention groups were defendants who were diverted to a MHC program—each program implementing key components of a MHC diversion program (screening of defendants for mental illness, assessment of identified defendants by a mental health professional, and the negotiation of sentencing between MHC staff and judicial staff) (Steadman et al. 1994). A consistent eligibility criterion among all the programs was that defendants were charged with misdemeanor or felony offences. Court referrals to community health services included, but were not

limited to: mental health services, addiction services, housing assistance, employment assistance, benefits application, and advocacy. Another difference was the inclusion of a case manager (Burns 2013; Cosden et al. 2003; Cusack et al. 2010; Dirks-Linhorst and Linhorst 2012; Hiday et al. 2013, 2016; Lowder et al. 2016; Moore and Hiday 2006; Trupin and Richards 2003) or court supervision (Gordon et al. 2006; Herinckx et al. 2005) as a component of the intervention. Cusack et al. (2010) was the only study that implemented a program that was a standardized model; it was based on the Assertive Community Treatment (ACT) model. Similar to ACT, the Forensic Assertive Community Treatment (FACT) program used a multidisciplinary team-based approach to provide services directly to defendants. What differentiates FACT from ACT is: the focus on mentally ill offenders, the explicit program goal of preventing re-arrests, use of court sanctions to encourage participants, the inclusion of probation officers as part of the treatment team, and the use of structured housing (e.g. supervised residential housing) (Lamberti et al. 2004). Another difference was the inclusion of a case manager (Burns 2013; Cosden et al. 2003; Cusack et al. 2010; Dirks-Linhorst and Linhorst 2012; Hiday et al. 2013, 2016; Lowder et al. 2016; Moore and Hiday 2006; Trupin and Richards 2003) or court supervision (Gordon et al. 2006; Herinckx et al. 2005) as a component of the intervention.

Comparison groups, on the other hand, varied among studies. For the majority of studies ( $n=8$ ), the comparison group consisted of defendants who were processed in traditional criminal court (TCC) or defendants who received TAU with no additional services (Anestis and Carbonell 2014; Christy et al. 2005; McNiel and Binder 2007; Moore and Hiday 2006; Lowder et al. 2016; Shafer et al. 2004; Steadman and Naples 2005; Steadman et al. 2011). Two studies had comparison groups that consisted of defendants who declined or partially/unsuccessfully completed a

**Table 4** Description of studies

Author(s), year, journal	Country	Intervention	Study population	Study design	Recidivism/police contact outcome measures
Anestis and Carbonell (2014) <i>Psychiatric Services</i>	United States	MHC vs. traditional criminal court (TCC) Intervention: MHC not described Comparison: Matched offenders in a TCC	Adults with a mental illness with felony or misdemeanor offences MHC Sample size n = 198 Male: 69% Female: 31% Mean age [SD]: 36.42 [12.47] years TCC n = 198 Male: 74% Female: 26% Mean age [SD]: 35.45 [11.21] years	Post-test control group design Data points: 12M prior and 12M post index offence	Rearrest percentage 12M post index offence Mean number of rearrests 12M post index offence Mean time to rearrests in months 12M post index offence
Burns et al. (2013) <i>American Behavioral Scientist</i>	United States	Successful MHC completion versus Opted-out and terminated from MHC Intervention: MHC program participants are immediately released from jail and enrolled into a series of mental health and/or substance abuse treatment phases accompanied with a case manager. Each progressive phase has less monitoring and less frequent court appearances and clinical contact Comparison: Participants who opted out of MHC or who were terminated from program	Adults who were diagnosed with severe mental illness, who may or may not have a co-occurring substance abuse disorder, and charged with a felony or misdemeanor Sample size n = 99 Male: 47.5% Female: 52.5% Age 20–29 years: 38.4% 30–39 years: 28.3% 40–49 years: 23.2% > 50 years: 10.1%	Static-group comparison Data points: 2 years before enrollment, 2 years post program exist	Rearrest percentage by MHC program completion status 2 years post program exist Probability of rearrest with MHC graduation

Table 4 (continued)

Author(s), year, journal	Country	Intervention	Study population	Study design	Recidivism/police contact outcome measures
Christy et al. (2005) <i>Behavioural Sciences and the Law</i>	United States	MHC diversion versus TCC Intervention: MHC connects defendants to obtain necessary mental health services Comparison: A matched sample with mental illness from a TCC from another County	Adults suffering from mental illness or mental retardation and arrested for misdemeanors Sample size MHC n = 116 Male: 66.4% Female: 33.6% Mean age [SD]: 36.36 [10.40] years TCC n = 101 Male: 60.4% Female: 39.6% Mean age [SD]: 37.66 [9.63] years	Post-test only control group design Data points: BL, 12M	At least one arrest 1-year after initial court appearance Mean number of arrests 1-year after initial court appearance Time to rearrest in days 1-year after initial court appearance
Cosden et al. (2003) <i>Behavioural Sciences and the Law</i>	United States	Mental Health Treatment Court (MHTC) vs. TAU Intervention: MHTC with intensive case management. Clients are assigned a case manager who helps them obtain resources such as transportation, housing, vocational training, community re-entry skills training, and substance abuse management. Upon program completion, if needed, clients are transferred to a long-term care team for ongoing treatment Comparison: TAU which consists of traditional adversarial court proceedings and referral to a long-term care team. Clients also had access to vocational rehabilitation and housing services	Adults with a serious and pervasive mental illness and who were charged with either a felony or misdemeanor and had at least one prior booking Sample size MHTC n = 137 Male: 48.9% Female: 51.1% Age: not described TAU n = 98 Male: 52.0% Female: 48.0% Age: not described	Post-test only control group RCT Data points: BL, 6M, 12M	Proportion booked at least once and spent time in jail at 12M follow-up Proportion convicted of a new crime at 12M follow-up

Table 4 (continued)

Author(s), year, journal	Country	Intervention	Study population	Study design	Recidivism/police contact outcome measures
Cowell et al. (2004) <i>Journal of Contemporary Criminal Justice</i>	United States	Jail diversion (1 pre-booking and 3 post-booking) Post-booking sites: Lane County, New York City and Tucson Intervention: A treatment plan is negotiated with bail commissioner, public defender, state attorney, and judge. With an agreed on plan, the diversion clinician makes the required referrals to community services and/or hospitals and monitors progress so that the court is kept informed Comparison: BL	Adults with co-occurring serious mental illness and substance abuse or dependence disorders and who committed low-level offenses Sample size Lane County = 185 New York City = 231 Tucson = 90 Male: 65% Female: 35% Mean age [SD]: 35.68 [9.21] years	Time series design Data points: BL, 3M, 12M	Effectiveness measure of post-booking diversion: arrested in past 30 days at 3M and 12M follow-up relative to BL
Cusack et al. (2010) <i>Community Mental Health Journal</i>	United States	Forensic Assertive Community Treatment (FACT) versus TAU Intervention: FACT program provided team-based mental health and substance abuse services, house, employment assistance, benefits application, and advocacy Comparison: TAU which consists of psychiatric assessment, outpatient/inpatient psychiatric medication, outpatient mental health, substance abuse counseling, and case management	Adults detained in the county jail who have been diagnosed with a major mental disorder and committed non-violent offenses Sample size FACT n = 72 Male: 60% Female: 40% Mean age [SD]: 38.8 [10.9] years TAU n = 62 Male: 58% Female: 42% Mean age [SD]: 34.4 [8.9] years	Multiple time series RCT Data points: BL, 12M, 24M	Mean number of bookings between 1–12M and 13–24M

Table 4 (continued)

Author(s), year, journal	Country	Intervention	Study population	Study design	Recidivism/police contact outcome measures
Dirks-Linhorst and Linhorst (2012) <i>American Journal of Criminal Justice</i>	United States	Successful St. Louis County Municipal Mental Health Court (MMHC) completion versus unsuccessful MMHC completion versus declined MMHC Intervention: Defendants are connected to mental health services in the community. Monitoring of defendants includes court visits, weekly phone calls to MMHC case managers, and written verification from community mental health providers regarding treatment compliance Comparison: Defendants who dropped out of MMHC or who were accepted but declined	Adults who have a mental illness and charged with ordinance violations (state misdemeanor type offenses) Sample n = 577 cases Male: not described Female: not described Mean age [SD]: 36.2 [14.2] Unit of study was cases given some defendants had multiple cases during the study period	Static-group comparison Data points: Oct 1, 2001 to Sept 30, 2007	Rearrest within 1 year of discharge
Gordon et al. (2006) <i>Federal Probation</i>	United States	Dual treatment track program (DTT) jail diversion program Intervention: The DTT is a jail diversion program with a highly structured and intensive regimen of supervision and treatment. Services include immediate evaluation by a psychiatrist, medication management, entry into intensive outpatient services, drug testing, and pretrial supervision Comparison: Pre-program entry, terminated program status	Adults who remain in jail, have substance use and mental health issues, and do not have any prior or pending violent charges Sample size n = 40 Male: not described Female: not described Age: not described	One-group pre-test – post-test design Data points: 12M prior to 12M post program entry	Arrests history 12M prior and 12M post program entry

Table 4 (continued)

Author(s), year, journal	Country	Intervention	Study population	Study design	Recidivism/police contact outcome measures
Han and Redlich (2016) <i>Psychiatric Services</i>	United States	MHC and TAU 4 Sites: San Francisco, CA; Santa Clara, CA; Hennepin, MN; Marion, IN Intervention: MHC not described Comparison: Similar subjects who met eligibility requirements but never rejected or were not referred to a MHC	Adults with a mental illness with misdemeanor or gross-misdemeanor-level charges and no history of violent offenses Sample size MHC n = 357 Male: 58% Female: 42% Mean age [SD]: 37.6 [10.7] years TAU: n = 384 Male: 62% Female: 28% Mean age [SD]: 36.2 [9.0] years	One-group pre-test – post-test design Data points: 6M before court entry, and 6M after	Mean number of arrests 6M before court entry, and 6M after Mean days in the community 6M before court entry, and 6M after
Herinckx et al. (2005) <i>Psychiatric Services</i>	United States	Clark County MHC Program Intervention: Screening and referral of defendants are completed within the first 24hr after arrest. Defendants who are accepted and voluntarily participate in the MHC program are linked to appropriate community based mental health services. All cases are court supervised for treatment compliance Comparison: Pre-program enrollment Unsuccessful MHC completion	Adults with a DSM-IV axis I illness who had been charged with either a misdemeanor charge or a felony charge that was successfully pled down to a misdemeanor Sample size n = 368 Male: 56% Female: 44% Mean age [SD]: 35 [11] years	One-group pre-test – post-test design Data points: 12M pre-MHC, 12M post-MHC	Mean number of arrests 12M pre-MHC and 12M post-MHC Probability of rearrest with successful MHC completion

Table 4 (continued)

Author(s), year, journal	Country	Intervention	Study population	Study design	Recidivism/police contact outcome measures
Hiday et al. (2013) <i>American Psychological Association</i>	United States	MHC versus TAU with a specialized supervision unit (SSU) Intervention: MHC that provides supervision, case management, linkages to mental health services agencies, drug testing, and treatment for dually diagnosed defendants Comparison: MHC-eligible defendants in a TCC with a dedicated SSU that provides comparable services as those received by MHC defendants MHC non-completion	Adults with severe mental illness charged with misdemeanors who have no pending charge or conviction of a dangerous or violent felony in the past 5 years Sample size MHC n = 408 Male: 50% Female: 50% Mean age [SD]: 41.4 [11.0] years TCC with SSU n = 687 Male: 63.3% Female: 36.7% Mean age [SD]: 40.7 [11.6] years	Static-group comparison Data points: 12M post court exit	Percent arrested 12M post court exit Number of arrests 12M post court exit Probability of rearrest with any MHC and MHC program status
Hiday et al. (2016) <i>Psychiatric Services</i>	United States	MHC versus TAU with a specialized supervision unit (SSU) Intervention: MHC that provides supervision, case management, linkages to mental health services agencies, drug testing, and treatment for dually diagnosed defendants Comparison: MHC-eligible defendants in a TCC with a dedicated SSU that provides comparable services as those received by MHC defendants MHC non-completion	Adults with severe mental illness charged with misdemeanors who have no pending charge or conviction of a dangerous or violent felony in the past 5 years Sample size MHC n = 408 Male: not described Female: not described Age: not described TCC with SSU n = 687 Male: not described Female: not described Age: not described	Static-group comparison Data points: 24M post court exit	Percent arrested 24M post court exit Probability of rearrest with MHC program status

Table 4 (continued)

Author(s), year, journal	Country	Intervention	Study population	Study design	Recidivism/police contact outcome measures
Lim and Day (2014) <i>Behavioural Sciences and the Law</i>	Australia	Magistrates Court Diversion Program (MCDP) Intervention: MCDP rely on mental health service professionals to help defendants address their offending behavior and mental impairment while their legal proceedings are suspended Comparison: Offender who did not successfully complete the MCDP	Adults with an ongoing mental impairment or be diagnosed with a personality disorder and have a violent or non-violent offense Sample size n = 219 Male: 59.8% Female: 40.2% Mean age [SD]: 33.5 [10.2] years	Non-equivalent control group design Data points: 24M pre-program enrollment, 24M post program completion	Time to re-offense 24M post program completion Number of charges 24M pre-program enrollment and 24M post program completion Probability of re-offending with successful program completion
Lowder et al. (2016) <i>Law and Human Behaviour</i>	United States	Pre-program enrollment MHC versus TAU Intervention: Assignment of a MH case manager and a prescribed individual treatment plan. MH case managers link defendants to community health services (including outpatient mental health treatment, mental health support groups, inpatient mental health treatment, and substance use treatment) and oversee defendant compliance. Defendants are required to abstain from drug use, complete community work, identify and maintaining housing, and attend bi-monthly court appearances Comparison: Defendants whose cases were adjudicated through traditional case processing and would not have received court referrals to community-based services. Comparison group selected based on propensity score matching	Adults with a mental illness with misdemeanor or gross-misdemeanor-level charges and no history of violent offenses Sample size MHC n = 57 Male: 45.6% Female: 54.4% Mean age [SD]: 34.48 [9.62] years TAU n = 40 Male: 52.5% Female: 47.5% Mean age [SD]: 36.05 [9.55] years	Post-test only control group design Data points: 12M post court exit	Mean number of charges 12M post court exit

Table 4 (continued)

Author(s), year, journal	Country	Intervention	Study population	Study design	Recidivism/police contact outcome measures
McNiel and Binder (2007) <i>The American Journal of Psychiatry</i>	United States	MHC diversion versus TAU Intervention: MHC connects defendants to treatment services. Criminal proceedings are not dismissed while in the program nor are they automatically dismissed on successfully completion Comparison: Comparison group selected based on propensity score matching	Adults who were diagnosed as having a mental disorder and have violent or non-violent charges Sample size MHC n = 170 Male: 74% Female: 26% Age: ≥18 years TAU n = 8,067 Male: 78% Female: 22% Age: ≥18 years	Post-test only control group design Data points: BL, 12M	MHC participation and successful MHC completion: Probability of rearrest as a function of time in months for any new charge at 12M follow-up Probability of rearrest as a function of time in months for new violent charge at 12M follow-up
Moore et al. (2006) <i>Law and Human Behaviour</i>	United States	MHC completion versus MHC partial completion versus TCC Intervention: MHC Team consisting of a dedicated judge, assistant district attorney, public defender, two private attorneys on the indigent list, mental health liaison, and if needed, probation officers, mental health case managers, and privately retained attorneys. MHC Team provides structure, supervision and encouragement for defendants. Mental health clinicians oversee treatment plans including therapy, medication, housing, employment assistance, social services and vocational training Comparison: Similar offenders in TCC in the same county before the establishment of a MHC	Adult with mental illness and/or substance abuse disorders charged with misdemeanor or felony offenses Sample size MHC n = 82 Male: 68.3% Female: 31.7% Age: not described TCC n = 183 Male: 72.7% Female: 27.3% Age: not described	Post-test only control group design Data points: 6M	Mean number of times rearrested at 6M follow-up Probability of rearrest at 6M follow-up with any MHC and MHC completion status on

Table 4 (continued)

Author(s), year, journal	Country	Intervention	Study population	Study design	Recidivism/police contact outcome measures
Shafer et al. (2004) <i>Behavioural Sciences and the Law</i>	United States	Post-booking jail diversion program vs. non-diversion Intervention: Post-booking diversion; release on condition (permits the client to participate in treatment instead of spending time in jail prior to their next court appearance), summary probation (a specified time of supervised or unsupervised probation in lieu of a jail sentence, the client is required to go to attend treatment and comply with any other conditions), and deferred prosecution (postponing legal proceedings for a period of time while the client participates in treatment) Comparison: Individuals not diverted	Adults with co-occurring disorders of substance use and serious mental illness Booked into the county jail for misdemeanor or low level felony offenses Sample size BL = 248, 3M = 226, 12M = 202 Male: 63% Female: 37% Age: not described	Multiple time series Data points: BL, 3M, 12M	Overall rearrest rates at 3M and 12M follow-up Arrested for lesser crimes in past 3 months at 3M follow-up and 12M follow-up
Steadman and Naples (2005) <i>Behavioural Sciences and the Law</i>	United States	Jail diversion (3 pre-booking and 3 post-booking) versus no jail diversion Post-booking Sites: Phoenix/Tucson, AZ; Hartford, New Haven, Bridgeport, CT; and Lane County, OR Intervention: Post-booking diversion not described Comparison: Similar non-diverted participants for each site meeting eligibility requirements	Adults with co-occurring disorders of substance use and serious mental illness, and who have misdemeanor or felony charges Sample size BL = 1612, 3M = 1260, 12M = 1187 Male: not described Female: not described Age: not described	Multiple time series Data points: BL, 3M, 12M	Number of arrests since intake at 3M and 6M follow-up Community days (the number of days not spent incarcerated or in psychiatric hospitals or in residential treatment) at 3M and 6M follow-up

Table 4 (continued)

Author(s), year, journal	Country	Intervention	Study population	Study design	Recidivism/police contact outcome measures
Steadman et al. (2011) <i>Archives of General Psychiatry</i>	United States	Post-booking diversion versus TAU 4 sites San Francisco, CA; Santa Clara, CA; Hennepin, MN; Marion, IN Intervention: Post-booking jail diversion not described Comparison: Similar subjects who met eligibility requirements but never rejected or were not referred to a MHC	Adults with serious mental illness and who have misdemeanor or felony charges Sample size n = 1047 Post-booking diversion Male: 58.2% Female: 41.8% Mean age: 37.5 years TAU Male: 63.2% Female: 36.8% Mean age: 36.6 years	Pre-test Post-test control group design Data points: 18M pre- and 18M post-program enrollment	Annualized rearrests rate means 18M pre- and post-program enrollment Annualized rearrests rate reduction between 18M pre- and 18M post-program enrollment
Trupin and Richards (2003) <i>International Journal of Law and Psychiatry</i>	United States	King County District Mental Health Court (KCMHC) and Seattle Municipal Mental Health Court (SMMHC) Intervention: Community placement and linkage to mental health treatment (including psychosocial programs, substance abuse treatment services, housing, and any other services deemed essential). Both courts have judge centered teams that includes a clinical social worker, prosecutor attorney, probation counselor, defence attorney (supported by a part-time social worker), and a program manager/coordinator Comparison: Pre-program enrollment, individuals who opted-out of MHC	Adults with mental illness and misdemeanor charges Sample size KCMHC: n = 246 SMMHC: n = 158 Male 75% Female: 25% Age: not described	Non-equivalent control group design Data points: Pre-MHC referral, 9M post MHC referral	Booking rate 9M post MHC referral

MHC program (Burns 2013; Dirks-Linhorst and Linhorst 2012)—while four studies made single group pre-program and post-program enrollment comparisons (Cowell et al. 2004; Gordon et al. 2006; Han and Redlich 2016; Herinckx et al. 2005). There were also seven studies that had multiple comparison groups (Gordon et al. 2006; Hiday et al. 2013, 2016; Lim and Day 2014; Lowder et al. 2016; Moore and Hiday 2006; Trupin and Richards 2003)—such as Moore et al. (2006) (MHC versus TCC, MHC completion versus MHC partial completion) and Lim and Day (2014) (pre-program vs. post-program enrollment, MHC successful completion versus MHC unsuccessful completion). Four studies had comparison groups that were provided either case management (Cusack et al. 2010; Hiday et al. 2013, 2016) or vocational and housing services (Cosden et al. 2003).

### Recidivism Outcomes

All 20 studies (Anestis and Carbonell 2014; Burns 2013; Christy et al. 2005; Cosden et al. 2003; Cowell et al. 2004; Cusack et al. 2010; Dirks-Linhorst and Linhorst 2012; Gordon et al. 2006; Han and Redlich 2016; Herinckx et al. 2005; Hiday et al. 2013, 2016; Lim and Day 2014; Lowder et al. 2016; McNiel and Binder 2007; Moore and Hiday 2006; Shafer et al. 2004; Steadman and Naples 2005; Steadman et al. 2011; Trupin and Richards 2003) reported recidivism outcomes that were measured as either rearrests, bookings (a process where suspected criminals are taken into police custody after arrest), or the incurrance of new charges (Table 5). The time frame during which recidivism outcomes were reported varied from past 30 days, past 3 months, and as far as past 24 months since program intake. In their study, Gordon et al. (2006) measured the number of arrests 12 months prior and 12 months post program intake but no statistical testing was reported.

### MHC Recidivism Rates

Overall, reported recidivism rates for MHC participants ranged between 8.1 and 76%. Ten studies reported significantly lower overall rearrest rates and/or new charges among clients who enrolled in a MHC than their respective comparison group (i.e. Pre-program enrollment, TCC, or TAU) (Anestis and Carbonell 2014; Dirks-Linhorst and Linhorst 2012; Han and Redlich 2016; Herinckx et al. 2005; Hiday et al. 2013, 2016; Moore and Hiday 2006; Shafer et al. 2004; Steadman et al. 2011; Trupin and Richards 2003). For example, Hiday and colleagues measured rearrest rates at 12 and 24 months post court exit (Hiday et al. 2013, 2016). At 12 months follow-up, 27.5% of MHC participants were rearrested and this was significantly lower ( $p < 0.001$ ) than those in TAU (37.3%) (Hiday et al. 2013). Similar results were reported at 24 months as MHC participants still had

significantly lower recidivism rates than the comparison group (38% vs. 48%,  $p = 0.001$ ) (Hiday et al. 2016).

Although 10 studies reported MHC defendants to have significantly lower recidivism rates, there were four studies that did not find any difference (Christy et al. 2005; Cusack et al. 2010; Lowder et al. 2016; Steadman and Naples 2005). For example, Christy et al. (2005) reported rearrest rates 1 year following court appearance to be 47% for those diverted to MHC versus 56% for those who were not—but this difference was found to be not statistically significant. However, when Cosden et al. (2003) looked at both the proportion of bookings and the proportion of new crime convictions—their results also showed there was no difference in the number of bookings. But in terms of convictions, the MHC group had a significantly lower proportion of individuals convicted of a new crime ( $p = 0.05$ ) compared to those in the TAU group (Cosden et al. 2003).

In terms of program status, seven studies reported recidivism outcomes by MHC program completion status. Four studies reported significantly lower rearrest rates among clients who successfully completed a MHC program compared to those who were partially successful or terminated from the program and returned to a TCC (Burns 2013; Dirks-Linhorst and Linhorst 2012; Lim and Day 2014; Moore and Hiday 2006). Two studies did not report statistical testing between MHC completion status groups (Hiday et al. 2013, 2016) and one study found no significant difference between groups (Lowder et al. 2016).

### Effect of MHC on Recidivism

Eight studies looked at the effect of MHC on recidivism (Burns 2013; Cowell et al. 2004; Herinckx et al. 2005; Hiday et al. 2013, 2016; Lim and Day 2014; Lowder et al. 2016; Moore and Hiday 2006). Among these studies, one study found MHC participants, compared to those in TCC or TAU, to be significantly less likely to be rearrested ( $\beta = -0.29$ ,  $SE = 0.15$ ,  $p < 0.001$ ) (Hiday et al. 2013)—while three studies found the two groups to be equally likely to be rearrested (Cowell et al. 2004; Lowder et al. 2016; Moore and Hiday 2006).

When looking into the effect of MHC on recidivism by program status (i.e. graduated or unsuccessful/terminated), five studies found MHC graduates to be significantly less likely to be rearrested than either unsuccessful MHC participants or those in TCC or TAU (Burns 2013; Hiday et al. 2013, 2016; Lim and Day 2014; Moore and Hiday 2006)—this is in contrast to two studies that found no significant differences (Herinckx et al. 2005; Lowder et al. 2016). Among unsuccessful MHC participants, two studies found this group to have the same likelihood of rearrest as those in TAU or TCC (Hiday et al. 2013; Moore and Hiday 2006). Conversely, one study (Hiday et al. 2016) found unsuccessful

**Table 5** Reported recidivism and police contact outcomes

Author(s), year, journal	Country	Intervention	Reported recidivism/police contact outcome measures
Anestis and Carbonell (2014) <i>Psychiatric Services</i>	United States	MHC versus traditional criminal court (TCC) Intervention: MHC not described Comparison: Matched offenders in a TCC	MHC versus TCC Rearrest percentage 12M post index offence: 10% versus 28% ( $p < 0.001$ ) Mean number of rearrests [SD] 12M post index offence: 0.12 [0.37] versus 0.42 [0.86] ( $p < 0.001$ ) Mean time to rearrests [SD] 12M post index offence in months: 11.27 [2.49] versus 9.63 [4.30] ( $p < 0.001$ )
Burns et al. (2013) <i>American Behavioral Scientist</i>	United States	Successful MHC completion versus Opted-out and Terminated from MHC Intervention: MHC Program participants are immediately released from jail and enrolled into a series of mental health and/or substance abuse treatment phases accompanied with a case manager. Each progressive phase has less monitoring and less frequent court appearances and clinical contact Comparison: Participants who opted out of MHC or who were terminated from program	Successful MHC completion versus Opted-out and Terminated from MHC Rearrest percentage by MHC program completion status 2 years post program exist: Graduate: 24.6% Opt-out: 76.9% Terminated: 90.7% Graduate versus Opted-out and Terminated: $p < 0.001$ Probability of rearrest with MHC graduation versus Opted-out and Terminated [95% CI]: Odds ratio = 0.12 [0.03, 0.48] ( $p < 0.01$ )
Christy et al. (2005) <i>Behavioural Sciences and the Law</i>	United States	MHC diversion versus TCC Intervention: MHC connects defendants to obtain necessary mental health services Comparison: A matched sample with mental illness from a TCC from another County	MHC diversion versus TCC At least one arrest in the 1-year following initial court appearance: 47% versus 56% (NS) Mean number of arrests for the 1-year follow-up period [SD]: 1.00 [1.34] versus 1.40 [1.78] (NS) Time to rearrest in days 1-year after initial court appearance: Hazard ratio = 1.32 (NS)
Cosden et al. (2003) <i>Behavioural Sciences and the Law</i>	United States	Mental health treatment court (MHTC) versus TAU Intervention: MHTC with intensive case management. Clients are assigned a case manager who helps them obtain resources such as transportations, housing, vocational training, community re-entry skills training, and substance abuse management. Upon program completion, if needed, clients are transferred to a long-term care team for ongoing treatment Comparison: TAU which consists of traditional adversarial court proceedings and referral to a long-term care team. Clients also had access to vocational rehabilitation and housing services	MHTC versus TAU Proportion booked at least once and spent time in jail at 12M follow-up: 76% versus 72% (NS) Proportion convicted of a new crime at 12M follow-up: 47% versus 60% ( $p = 0.05$ )

Table 5 (continued)

Author(s), year, journal	Country	Intervention	Reported recidivism/police contact outcome measures
Cowell et al. (2004) <i>Journal of Contemporary Criminal Justice</i>	United States	Jail diversion (1 pre-booking and 3 post-booking) Post-booking sites: Lane County, New York City and Tucson Intervention: A treatment plan is negotiated with bail commissioner, public defender, state attorney, and judge. With an agreed on plan, the diversion clinician makes the required referrals to community services and/or hospitals and monitors progress so that the court is kept informed Comparison: BL	Effectiveness of post-booking diversion Odds ratio arrested in past 30 days: 3-month effect relative to BL Lane County [SE]: 3.24 [1.94] (NS) New York City [SE]: 1.24 [2.88] (NS) Tucson [SE]: 0.41 [3.66] (NS) Odds ratio arrested in past 30 days: 12-month effect relative to BL Lane County [SE]: 1.28 [2.25] (NS) New York City [SE]: 0.54 [3.02] (NS) Tucson [SE]: 0.25 [3.39] (NS) FACT versus TAU Mean number of bookings [SD] between 1–12M and 13–24M 1–12M: 0.64 [1.2] versus 1.42 [1.86] (NS) 13–24M: 0.57 [1.13] versus 0.89 [1.82] (NS)
Cusack et al. (2010) <i>Community Mental Health Journal</i>	United States	Forensic Assertive Community Treatment (FACT) versus TAU Intervention: FACT program provided team-based mental health and substance abuse services, house, employment assistance, benefits application, and advocacy Comparison: TAU which consists of psychiatric assessment, outpatient/inpatient psychiatric medication, outpatient mental health, substance abuse counselling, and case management	Successful MMHC completion versus unsuccessful MMHC completion versus declined MMHC Rearrest within 1 year of discharge Successful MMHC completion: 14.5% Unsuccessful MMHC completion: 38.0% Declined MMHC: 25.8% ( $p \leq 0.001$ for all within group comparisons)
Dirks-Linhorst and Linhorst (2012) <i>American Journal of Criminal Justice</i>	United States	Successful St. Louis County Municipal Mental Health Court (MMHC) completion versus unsuccessful MMHC completion versus declined MMHC Intervention: Defendants are connected to mental health services in the community. Monitoring of defendants includes court visits, weekly phone calls to MMHC case managers, and written verification from community mental health providers regarding treatment compliance Comparison: Defendants who dropped out of MMHC or who were accepted but declined	Successful MMHC completion versus unsuccessful MMHC completion versus declined MMHC Rearrest within 1 year of discharge Successful MMHC completion: 14.5% Unsuccessful MMHC completion: 38.0% Declined MMHC: 25.8% ( $p \leq 0.001$ for all within group comparisons)
Gordon et al. (2006) <i>Federal Probation</i>	United States	Dual treatment track program (DTT) jail diversion program Intervention: The DTT is a jail diversion program with a highly structured and intensive regimen of supervision and treatment. Services include immediate evaluation by a psychiatrist, medication management, entry into intensive outpatient services, drug testing, and pretrial supervision Comparison: Pre-program entry, terminated program status	DTT jail diversion program Arrests history 12M prior and 12M post program entry 12M Prior program entry: 63% 12M Post program entry: 61% No statistical testing reported Successful versus Terminated program status 12M Post program entry: 27% versus 41% No statistical testing reported
Han and Redlich (2016) <i>Psychiatric Services</i>	United States	MHC and TAU 4 sites: San Francisco, CA; Santa Clara, CA; Hennepin, MN; Marion, IN Intervention: MHC not described Comparison: Similar subjects who met eligibility requirements but never rejected or were not referred to a MHC	MHC and TAU Mean number of arrests 6M before court entry versus 6M after MHC: 1.31 [1.12] versus 0.45 [0.85] ( $p < 0.001$ ) TAU: 1.85 [1.88] versus 0.65 [1.64] ( $p < 0.001$ ) Mean days in the community 6M before court entry, and 6M after MHC: 146.74 [50.82] versus 142.81 [49.54] (NS) TAU: 154.21 [45.70] versus 95.22 [64.43] ( $p < 0.001$ )

Table 5 (continued)

Author(s), year, journal	Country	Intervention	Reported recidivism/police contact outcome measures
Herineckx et al. (2005) <i>Psychiatric Services</i>	United States	Clark County MHC program Intervention: Screening and referral of defendants are completed within the first 24hr after arrest. Defendants who are accepted and voluntarily participate in the MHC program are linked to appropriate community based mental health services. All cases are court supervised for treatment compliance Comparison: Pre-program enrollment Unsuccessful MHC completion	Mean number of arrests 12M pre-MHC and 12M post-MHC 12M Pre-MHC [SD]: 1.99 [1.6] 12M Post-MHC [SD]: 0.48 [0.51] ( $p < 0.05$ ) Probability of rearrest with successful MHC completion versus terminated MHC [95% CI] Odds ratio = 0.27 [0.13, 0.57] (NS)
Hiday et al. (2013) <i>American Psychological Association</i>	United States	MHC versus TAU with a specialized supervision unit (SSU) Intervention: MHC that provides supervision, case management, linkages to mental health service agencies, drug testing, and treatment for dually diagnosed defendants Comparison: MHC-eligible defendants in a TCC with a dedicated SSU that provides comparable services as those received by MHC defendants MHC non-completion	Percent arrested 12M post court exit MHC versus TAU with SSU: 27.5% versus 37.3% ( $p < 0.001$ ) MHC completion versus non-completion: 17.6% versus 41.2% No statistical testing reported Number of arrests 12M post court exit MHC versus TAU with SSU 0: 72.5% versus 62.7% 1: 19.4% versus 22.1% 2: 5.6% versus 9.5% 3: 1.7% versus 3.9% 4: 0.7% versus 1.5% 5 +: 0.0% versus 0.3% ( $p < 0.001$ ) Probability of rearrest with any MHC and MHC program status versus TAU with SSU [SE] Any MHC: $\beta = -0.29$ [0.15] ( $p < 0.001$ ) MHC completion: $\beta = -0.71$ [0.20] ( $p < 0.001$ ) MHC non-completion: $\beta = 0.13$ [0.19] (NS)
Hiday et al. (2016) <i>Psychiatric Services</i>	United States	MHC versus TAU with a specialized supervision unit (SSU) Intervention: MHC that provides supervision, case management, linkages to mental health service agencies, drug testing, and treatment for dually diagnosed defendants Comparison: MHC-eligible defendants in a TCC with a dedicated SSU that provides comparable services as those received by MHC defendants MHC non-completion	Percent arrested 24M post court exit MHC versus TAU with SSU: 38% versus 48% ( $p = 0.001$ ) MHC completion versus non-completion 25% versus 55% No statistical testing reported Probability of rearrest with program status versus TAU with SSU [95% CI] MHC completion: odds ratio = 0.52 [0.36, 0.74] ( $p < 0.001$ ) MHC non-completion: odds ratio = 1.58 [1.01, 2.10] ( $p = 0.047$ )

Table 5 (continued)

Author(s), year, journal	Country	Intervention	Reported recidivism/police contact outcome measures
Lim and Day (2014) <i>Behavioural Sciences and the Law</i>	Australia	Magistrates Court Diversion Program (MCDP) Intervention: MCDP rely on mental health service professionals to help defendants address their offending behavior and mental impairment while their legal proceedings are suspended Comparison: Offender who did not successfully complete the MCDP Pre-program enrollment	Magistrates Court Diversion Program (MCDP) Successful versus unsuccessful program completion Mean time to re-offense in months [95% CI] 24M post program completion: 8.96 [7.14, 10.79] versus 9.87 [7.99, 11.75] (NS) 24M Pre-program enrollment versus 24M Post-program completion Mean number of charges [SD]: 4.78 [ 5.98] versus 1.37 [2.57] ( $p < 0.05$ ) Probability of re-offending with successful program completion versus Unsuccessful program completion [SE]: $\beta = -0.33$ [0.08] ( $p < 0.05$ )
Lowder et al. (2016) <i>Law and Human Behaviour</i>	United States	MHC versus TAU Intervention: Assignment of a MH case manager and a prescribed individual treatment plan. MH case managers link defendants to community health services (including outpatient mental health treatment, mental health support groups, inpatient mental health treatment, and substance use treatment) and oversee defendant compliance. Defendants are required to abstain from drug use, complete community work, identify and maintaining housing, and attend bi-monthly court appearances Comparison: Defendants whose cases were adjudicated through traditional case processing and would not have received court referrals to community-based services. Comparison group selected based on propensity score matching	Any MHC versus TAU Number of charges 12M post court exit Mean [SD] = 2.09 [5.87] versus 2.45 [3.47] Odds ratio = 0.90 (NS) MHC graduates versus TAU Number of charges 12M post court exit Mean [SD] = 1.03 [3.40] versus 2.45 [3.47] Odds ratio = 1.81 (NS)
McNiel and Binder (2007) <i>The American Journal of Psychiatry</i>	United States	MHC diversion versus TAU Intervention: MHC connects defendants to treatment services. Criminal proceedings are not dismissed while in the program nor are they automatically dismissed on successfully completion Comparison: Comparison group selected based on propensity score matching	Participation in a MHC Probability of rearrest as a function of time in months for any new charge at 12M follow-up versus TAU [SE]: $\beta = -0.63$ [0.04] ( $p < 0.0001$ ) Probability of rearrest as a function of time in months for a new violent charge at 12M follow-up versus TAU [SE]: $\beta = -2.36$ [0.17] ( $p < 0.0001$ ) Successful MHC completion Probability of rearrest as a function of time in months for any new charge at 12M follow-up versus TAU [SE]: $\beta = -1.79$ [0.13] ( $p < 0.0001$ ) Probability of rearrest as a function of time in months for a new violent charge at 12M follow-up versus TAU [SE]: $\beta = -3.06$ [0.30] ( $p < 0.0001$ )

Table 5 (continued)

Author(s), year, journal	Country	Intervention	Reported recidivism/police contact outcome measures
Moore et al. (2006) <i>Law and Human Behaviour</i>	United States	MHC completion versus MHC partial completion versus TCC Intervention: MHC Team consisting of a dedicated judge, assistant district attorney, public defender, two private attorneys on the indigent list, mental health liaison, and if needed, probation officers, mental health case managers, and privately retained attorneys. MHC Team provides structure, supervision and encouragement for defendants. Mental health clinicians oversee treatment plans including therapy, medication, housing, employment assistance, social services and vocational training Comparison: Similar offenders in TCC in the same county before the establishment of a MHC	Mean number of times rearrested [range] at 6M follow-up Any MHC versus TCC: 1.10 [0–6] versus 2.36 [0–15] ( $p < 0.001$ ) MHC completion versus MHC partial completion: 0.58 [0–6] versus 2.03 [0–6] ( $p < 0.001$ ) Probability of rearrest at 6M follow-up with any MHC versus TCC Incident rate ratio [SE] = 0.55 [0.21] (NS) Probability of rearrest at 6M follow-up with MHC completion status versus TCC MHC completion: incident rate ratio [SE] = 0.29 [0.27] ( $p < 0.001$ ) MHC non-completion: incident rate ratio [SE] = 0.99 [0.28] (NS)
Shafer et al. (2004) <i>Behavioural Sciences and the Law</i>	United States	Post-booking jail diversion program versus non-diversion Intervention: Post-booking diversion: release on condition (permits the client to participate in treatment instead of spending time in jail prior to their next court appearance), summary probation (a specified time of supervised or unsupervised probation in lieu of a jail sentence, the client is required to go to attend treatment and comply with any other conditions), and deferred prosecution (postponing legal proceedings for a period of time while the client participates in treatment) Comparison: Individuals not diverted	Post-booking jail diversion program versus non-diversion Overall rearrest rates at 3M and 12M follow-up 3M and 12M: NS, no main effect for diversionary status or time Arrested for lesser crimes in past 3 months at 3M and 12M follow-up 3M: [not reported] 12M: 8.1% versus 20.5% ( $p \leq 0.011$ )
Steadman and Naples (2005) <i>Behavioural Sciences and the Law</i>	United States	Jail diversion (3 pre-booking and 3 post-booking) versus no jail diversion Post-booking sites: Phoenix/Tucson, AZ; Hartford, New Haven, Bridgeport, CT; and Lane County, OR Intervention: Post-booking diversion not described Comparison: Similar non-diverted participants for each site meeting eligibility requirements	Post-booking diversion versus no jail diversion Number of arrests since intake at 3M and 12M follow-up 3M: [not reported] 12M: 1.4 versus 1.15 (NS) Community days at 3M and 12M follow-up 3M: [not reported] 12M: 288.5 versus 222.1 ( $p < 0.001$ for overall difference between diverted and non-diverted)
Steadman et al. (2011) <i>Archives of General Psychiatry</i>	United States	Post-booking diversion versus TAU 4 sites San Francisco, CA; Santa Clara, CA; Hennepin, MN; Marion, IN Intervention: Post-booking jail diversion not described Comparison: Similar subjects who met eligibility requirements but never rejected or were not referred to a MHC	Post-booking diversion versus TAU Annualized rearrests rate means 18M pre- and post-program enrollment Pre-18M [SD]: 2.1 [3.0] versus 2.6 [6.1] Post-18M [SD]: 1.3 [3.0] versus 2.0 [8.8] Annualized arrest rate reduction between 18M pre- and post-program enrollment 0.8 versus 0.6 ( $p < 0.001$ )

**Table 5** (continued)

Author(s), year, journal	Country	Intervention	Reported recidivism/police contact outcome measures
Trupin and Richards (2003) <i>International Journal of Law and Psychiatry</i>	United States	King County District Mental Health Court (KCMHC) and Seattle Municipal Mental Health Court (SMMHC) Intervention: Community placement and linkage to mental health treatment (including psychosocial programs, substance abuse treatment services, housing, and any other services deemed essential). Both courts have judge centered teams that includes a clinical social worker, prosecutor attorney, probation counselor, defence attorney (supported by a part-time social worker), and program manager/coordinator Comparison: Pre-program enrollment, individuals who opted-out of MHC	Booking rate KCMHC Pre-MHC referral versus 9M post MHC referral: Decreased ( $p < 0.025$ ) SMMHC Pre-MHC referral versus 9M post MHC referral: Decreased ( $p < 0.05$ ) MHC Opt-in versus MHC Opt-out: decreased ( $p < 0.025$ )

MHC participants to be 1.6 times greater risk of being rearrested compared to TAU (Odds ratio 1.58, 95% CI [1.01, 2.10],  $p = 0.047$ ).

### Police Contact Outcomes

Six of the 20 accepted studies (Anestis and Carbonell 2014; Christy et al. 2005; Han and Redlich 2016; Lim and Day 2014; McNeil and Binder 2007; Steadman and Naples 2005) reported on police contact outcomes. In terms of reported outcome measures, however, no study was found to report results as the number of contacts with police. Instead, police contact outcomes were measured and reported as either time in the community or time to rearrest (Table 5). Observation time frames were found to be either 12 or 24 months.

### MHC Time in the Community/Time to Rearrest Rates

When looking at time in the community or time to rearrest, two studies found MHC participants to have significantly better outcomes. More specifically, Steadman and Naples (2005) found those diverted to a MHC had significantly more days in the community compared to those in TCC (288.5 vs. 222.1 days,  $p < 0.001$ ). Similarly, Anestis and Carbonell (2014) found a significantly longer time to rearrest among MHC clients versus those in TCC. However, when comparing MHC participants who successfully completed the program and those who did not, Lim and Day (2014) found no significant difference between groups—and this was also the case for Han et al. (2016), who found no significant difference within group (6 months before court entry versus 6 months after).

### Effect of MHC on Time in the Community/Time to Rearrest

McNeil and Binder (2007) also looked at the effect of participating in a MHC and the effect of successfully completing a MHC program. Compared to TCC clients, those who participated in a MHC were predicted to have longer times to any new charges ( $\beta = -0.63$ ;  $p < 0.001$ ) (McNeil and Binder 2007). When comparing clients who successfully completed a MHC program versus those in TCC, the effect was even greater ( $\beta = -1.79$ ;  $p < 0.001$ ) (McNeil and Binder 2007). In contrast, Christy et al. (Christy et al. 2005) found no significant differences in probability of arrest over time.

## Discussion

The purpose of this systematic review of the literature was to look at the current evidence on the effectiveness of MHCs in reducing client recidivism rates and contact with police. In total, 20 studies were identified of which all but three studies

were found to be at a high risk for bias. For the majority of studies, a consistent challenge was the inability to mask participants or study personnel about which court participants were being processed in due to the nature of the intervention. Another problem was the lack of study descriptions that resulted in insufficient information to verify whether any outcomes were selectively reported.

### Effects of Study Design and Risk of Bias

In terms of study designs, 70% ( $n = 14$ ) of studies implemented either post-test only control group, static group comparison, or one group pre-test post-test designs. In view of these considerations, post-test only control group designs suffer from two possible limitations—the interaction of selection bias and experimental variables, and reactive arrangements. Static group comparison designs, on the other hand, have possible limitations associated with maturation (such as age differences between non-randomized groups), and definite limitations related to selection bias (due to the absence of randomization), experimental mortality (due to group differences), and the interaction of selection bias and maturation. And lastly, one group pre-test- post-test designs have the most vulnerabilities due to the absence of a control group. Under this design, it is not possible to ensure that the results of the experiment were not due to events outside of the experiment, the effects of repeated testing, changes in participants over time, or the effect of instrumentation. Furthermore, this design is also susceptible to the interaction effects between testing and experiment, selection bias and experimental variables—and is at possible risk from statistical regression and reactive arrangement.

Despite the varying number of potential compromises to validity among all the study designs used, the overwhelming majority of studies ( $n = 17$ ) used statistical methods that controlled susceptibilities that stemmed from non-randomization through logistic regressions or propensity score matching. However, 17 studies (85%) were still found to have a high risk of bias while 3 studies (15%) were assessed to have moderate risk. To minimize these susceptibilities, future studies should compare the characteristics of clients who remained in the study versus those who withdrew—ensuring study withdrawal was not possibly due to any significant differences between groups that could have affected outcomes.

### Recidivism

Among the studies that looked at recidivism, recidivism was measured as the number of rearrests, bookings, or the incurrance of new charges. Time frames for which outcomes were recorded varied from past 30 days to past 24 months since intake. The results of these studies suggest there is some evidence that diversion to a MHC can lead to a significant

decrease in recidivism rates (Anestis and Carbonell 2014; Burns 2013; Dirks-Linhorst and Linhorst 2012; Han and Redlich 2016; Herinckx et al. 2005; Hiday et al. 2013, 2016; Lim and Day 2014; Moore and Hiday 2006; Shafer et al. 2004; Steadman et al. 2011; Trupin and Richards 2003). A common characteristic among studies that found a positive recidivism outcome were MHCs who had a case manager (Burns 2013; Dirks-Linhorst and Linhorst 2012; Hiday et al. 2013, 2016; Moore and Hiday 2006; Trupin and Richards 2003) or court supervision (Herinckx et al. 2005) as a part of the intervention. In two studies (Cosden et al. 2003; Cusack et al. 2010) where no significant differences in recidivism were found, the comparison group was provided a case manager or access to vocational and housing services. Taken together, this suggests that case managers or access to vocational and housing services may be important components of MHCs which successfully reduced client rearrest rates. Future studies should seek to distinguish whether positive outcomes are related to the presence of a case manager or due to the services with which clients are connected. Determining how strong the association is between MHC diversion and lower recidivism rates also requires further exploration—increasing the observation period or length of follow-up may be one approach. Another important finding is that diversion is effective in preventing recidivism for some but not for others—opening a new line of questioning as to why this may be. Determining what individual factors may be associated with positive recidivism outcomes is an area of research that is less known and warrants further study (Ryan, Brown, and Watanabe-Galloway 2010; Verhaaff and Scott 2015).

### Police Contact

When looking at police contact, six studies reported outcomes either as time in the community or time to rearrest. An equal proportion of studies have reported that diversion to a MHC may (Anestis and Carbonell 2014; McNiel and Binder 2007; Steadman and Naples 2005) or may not (Christy et al. 2005; Han and Redlich 2016; Lim and Day 2014) lead to a significant decrease in police contact (i.e. increase time in the community or time to rearrest). Thus, the evidence for the effectiveness of MHC in reducing police contact is inconclusive—but this line of inquiry seems to be in its infancy given the limited number of studies to draw upon. What is strikingly absent is the lack of information on the number of instances of client contact with police in the community for suspected violations of the law by the client—suggesting this kind of information is not recorded or collected systematically by law enforcement. Without this information, ascertaining the impact of MHC diversion on client contact with police could prove to be more difficult. Simply measuring time in the community or time to rearrest

would overlook instances where client contact with police was made but did not result in being arrested and taken to the station for processing. However, a measure of any contact could reflect an individual's behavior or the officer's sensitivity to the behavior. Thus, in one way, the actual frequency of client contact with police would likely be underestimated. One possible solution to partially address this could be counting the number of calls that police respond to—specifically, those that are mental illness related and involve MHC clients.

### Strengths and Limitations of the Review

To assess the current evidence on the effectiveness of MHCs to reduce client recidivism rates and contact with police, this systematic literature review used a comprehensive search strategy that employed both truncated word search commands and database specific adjacency operators. However, there are limitations that should be considered when interpreting the findings of this review. Although eight scientific databases were systematically searched, there is a possibility that a relevant study was not indexed in any of the included databases, and as a result, was excluded in this review. Moreover, this search was limited to English language journals. Relevant studies from countries where English is not their native language could have been missed if they were published in other languages. Another limitation to consider is the susceptibility of studies to bias that may have influenced study results. Although MHC diversion program are characterized by three key components (screening, assessment, and negotiation between court diversion and criminal justice staff), the lack of consensus on the features that constitute a MHC may lead to differences in program and design between courts (R.D. Schneider et al. 2007)—differences that may have affected study results. Lastly, the maximum follow-up period among accepted studies was 24 months. To date, it is not known if the effects of MHCs change over time, and as a result, future studies should consider longer observation periods longer than 24 months.

### Conclusion

This systematic literature review assessed the current evidence on the effectiveness of MHCs in reducing client recidivism rates and police contact. Although the effect of MHCs on client contact with police is less clear given the limited number of studies to draw from, there seems to be some evidence to show that MHCs help to reduce recidivism rates. Results also suggest either case managers or access to vocational and housing services may be important components of effective MHCs. Future studies should consider investigating the strength of association between MHC diversion and

lower recidivism, distinguishing the effects of having a case manager versus connected client services, and explore what individual factors may be associated with positive recidivism outcomes. Future studies should also consider longer observation periods to explore whether the effects of MHCs remain the same over longer periods of time.

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**Data Availability** All the published papers used in this manuscript are publicly available. There are no data available.

### Compliance with Ethical Standards

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

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