Interventions for drug-using offenders with co-occurring mental illness (Review)

Perry AE, Neilson M, Martyn-St James M, Glanville JM, McCool R, Duffy S, Godfrey C, Hewitt C

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[Intervention Review]

Interventions for drug-using offenders with co-occurring mental illness

Amanda E Perry[1], Matthew Neilson[1], Marrissa Martyn-St James[2], Julie M Glanville[3], Rachael McCool[3], Steven Duffy[4], Christine Godfrey[1], Catherine Hewitt[1]

[1]Department of Health Sciences, University of York, York, UK. [2]School of Health and Related Research (ScHARR), University of Sheffield, Sheffield, UK. [3]York Health Economics Consortium, York, UK. [4]NHS Centre for Reviews and Dissemination, University of York, York, UK

Contact address: Amanda E Perry, Department of Health Sciences, University of York, Heslington, York, YO105DD, UK. amanda.perry@york.ac.uk.

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ABSTRACT

Background

This is an updated version of an original Cochrane review published in Issue 3 2006 (Perry 2006). The review represents one from a family of four reviews focusing on interventions for drug-using offenders. This specific review considers interventions aimed at reducing drug use or criminal activity, or both for drug-using offenders with co-occurring mental illness.

Objectives

To assess the effectiveness of interventions for drug-using offenders with co-occurring mental illness in reducing criminal activity or drug use, or both.

Search methods

We searched 14 electronic bibliographic databases (searched between 2004 and 21 March 2013) and five internet resources (searched between 2004 and 11 November 2009). We contacted experts in the field for further information.

Selection criteria

We included randomised controlled trials designed to reduce, eliminate or prevent relapse in drug-using offenders with co-occurring mental illness. We also reported data on the cost and cost effectiveness of interventions.

Data collection and analysis

We used standard methodological procedures expected by The Cochrane Collaboration.

Main results

We identified 76 trials across the four reviews. Following a process of pre-screening, we judged eight trials to meet the inclusion criteria for this specific review (three of the five trials are awaiting classification). The five included 1502 participants. The interventions reported on case management via a mental health drugs court, a therapeutic community, and an evaluation of a motivational interviewing technique

and cognitive skills in comparison to relaxation training. The methodological quality of the trials was generally difficult to rate due to a lack of clear reporting. On most risk of bias items, we rated the majority of studies as unclear. Overall, the combined interventions did not show a statistically significant reduction in self reported drug use (2 studies, 715 participants; risk ratio (RR) 0.82, 95% confidence interval (CI) 0.44 to 1.55). A statistically significantly reduction was shown for re-incarceration (4 studies, 627 participants; RR 0.40, 95% CI 0.24 to 0.67 and mean difference (MD) 28.72, 95% CI 5.89 to 51.54) but not re-arrest (2 studies, 518 participants; RR 1.00, 95% CI 0.90 to 1.12). A specific subgroup analysis combining studies using therapeutic community interventions showed a statistically significant reduction in re-incarceration (2 studies, 266 participants; RR 0.29, 95% CI 0.16 to 0.54) but not re-arrest (1 study, 428 participants; RR 0.90, 95% CI 0.61 to 1.33). Case management via a mental health court and motivational interviewing with cognitive skills did not show a statistically significant reduction in criminal activity (1 study, 235 participants; RR 1.05, 95% CI 0.90 to 1.22) or self reported drug misuse (1 study, 162 participants; MD -7.42, 95% CI -20.12 to 5.28). Due to the small number of studies, we were unable to analyse the impact of setting on outcome. Some cost information was provided in the trials but not sufficient to be able to evaluate the cost effectiveness of the interventions.

Authors' conclusions

This review highlights the paucity of evidence for drug misusing offenders with co-occurring mental health problems. Two of the five trials showed some promising results for the use of therapeutic communities and aftercare, but only in relation to reducing subsequent re-incarceration. The studies overall, showed a high degree of statistical variation demonstrating a degree of caution in the interpretation of the magnitude of effect and direction of benefit for treatment outcomes. More evaluations are required to assess the effectiveness of interventions for drug-using offenders with co-occurring mental health problems.

PLAIN LANGUAGE SUMMARY

Interventions for drug-using offenders with co-occurring mental illness

Background

A number of policy directives are aimed at enabling people with drug problems to live healthy, crime-free lives. Drug-using offenders with co-occurring mental health problems represent a group of people who access treatment for a variety of different reasons. The complexity of the two problems makes the treatment and rehabilitation of this group of people particularly challenging.

Study characteristics

The review authors searched scientific databases and internet resources to identify randomised controlled trials (where participants are allocated at random to one of two or more treatment groups) of interventions to reduce, eliminate, or prevent relapse or criminal activity of drug-using offenders with co-occurring mental illness. We included people of any gender, age or ethnicity.

Key results

We identified eight trials (three of which are awaiting classification) evaluating treatments for drug-using offenders with co-occurring mental illness. The interventions included case management via a mental health court, a therapeutic community and an evaluation of motivational interviewing techniques and cognitive skills (a person's ability to process thoughts) in comparison to relaxation training. Overall, the combined interventions were not found to reduce self report drug use, but did have some impact on re-incarceration rates, but not re-arrest. A specific analysis of therapeutic community interventions did subsequently reduce re-incarceration but proved to be less effective for re-arrest and self report drug use. Two single studies evaluating case management via a mental health drug court and motivational interviewing and cognitive skills did not show significant reductions in criminal activity and self report drug use respectively. Little information is provided on the costs and cost-effectiveness of such interventions and trial evaluations focusing specifically on the needs of drug misusing offenders with co-occurring mental health problems are required.

Quality of the evidence

This review was limited by the lack of information reported in this group of trials and the quality of the evidence is unclear. The evidence is current to March 2013.

BACKGROUND

This review forms part of a family of four reviews providing a close examination of what works in reducing drug use and criminal activity in drug-using offenders. Overall, the four reviews contain 76 trials, generating 99 publications and 58 different comparisons (Perry 2013b; Perry 2013a; Perry 2013c). The four reviews represent a specific interest in pharmacological interventions, non-pharmacological interventions, female offenders and offenders with co-occurring mental illness. All four reviews stem from an updated previous Cochrane systematic review (Perry 2006). In this set of four reviews, we consider not only the effectiveness of interventions based on two key outcomes but also analyse the impact of setting and intervention type. Presented here is the revised methodology for this individual review focusing on the impact of interventions for drug-using offenders with co-occurring mental illness.

Description of the condition

Mental health issues in offenders are common with nearly 321,884 of the 2.1 million prisoners having a serious mental illness (Lamb 2007). One study of mental illness in jails found that more women than men (14.5% men and 31% of women) have a serious mental illness (Steadman 2009). Other studies have reported that a greater proportion of mentally ill people are arrested compared with the general population (Lamb 1998). Factors cited as causes include a lack of support in the community, problems accessing treatment, and the attitudes of police and society. In the US, individuals incarcerated to jails are generally on remand awaiting trial, while those in prison have been sentenced within the criminal justice system. One systematic review of 62 surveys in western prisons found that prisoners were several times more likely to have psychosis or major depression and 10 times more likely to have an antisocial personality disorder than the general population. It is unknown how well the prison service is addressing these problems (Fazel 2002).

In the UK, renewed emphasis from Clarke's green paper, Breaking the Cycle, recognises that the justice system is not always the best place to manage the problems of less serious offenders where their criminal behaviour is related to their mental health problems. As a result, several diversionary schemes are to be established by 2014 (Ministry of Justice 2010). This has been supported by previous systematic reviews and meta-analytical techniques that have evaluated diversion programmes (e.g. mental health courts) providing a mechanism for diverting individuals with severe mental illness into treatment programmes instead of the prison system (e.g. Sarteschi 2011). Findings from such studies generally show positive improvements on a small number of clinical outcomes. However, the conclusions are often limited by the research design (i.e. quasi-experimental studies) introducing potential bias about the relative effectiveness of such schemes. Evidence from one systematic review of serious mentally disordered adult offenders identified seven trials but the evidence was insufficient to draw conclusions. The authors called for more comparative trials to increase their confidence in the findings (Fontanarosa 2013).

Description of the intervention

Many different treatments for substance misuse (e.g. detoxification and therapeutic communities) have been adopted for use in the criminal justice system. This review included any intervention that was designed to reduce, eliminate or prevent relapse to drug use or criminal activity, or both. This resulted in the inclusion of a wide range of treatments focusing on: case management via a mental health drug court, therapeutic communities and motivational interviewing (MI) with cognitive skills in comparison to relaxation training. The evidence to support the effectiveness of these interventions differs, and is dependent upon the quality of the experimental evaluations employed to assess whether they are successful in reducing drug use or criminal activity, or both.

Case management, supervision evolved traditionally to address the needs of prisoner re-entry programmes covering employment, education, health, housing and family support via assessment and connecting clients with the appropriate services (Austin 1994). Case management in the US has been applied in Treatment Accountability for Safer Communities (TASC) programmes (Marlowe 2003b), and has shown initial effectiveness but without systematic evidence in support of the process.

Previous meta-analyses and systematic reviews of therapeutic community (TC) interventions specifically with aftercare have been shown to have modest effects in the reduction of recidivism and drug use (e.g. Mitchell 2012a; Pearson 1999).

Cognitive-behavioural approaches, including self monitoring, goal setting, self control training, interpersonal skills training, relapse prevention, group work and lifestyle modification have shown signs of success with offenders generally (Lipsey 2007), but the evidence has been based on systematic reviews that have excluded evaluations focusing specifically on the needs of drug-using offenders. Two previous systematic review of motivational interviewing (MI) found that MI can lead to improved retention in treatment, enhanced motivation to change and reduced offending, although there are variations across studies (McMurran 2009; Smedslund 2011).

Policy interests have also placed an increasing demand on knowing more about the cost and cost-effectiveness of such interventions. Some evidence can be drawn from systematic reviews completed in the area. Despite the growing knowledge about the effectiveness of treatment programmes for offenders, in general there has been no recent systematic review evidence focusing on the effectiveness of

treatment for offenders with drug misuse and co-occurring mental health problems.

How the intervention might work

Interventions delivered to drug-using offenders under the care of the criminal justice system have varied over time. Case management has been used to describe a problematic term that amounts to a range of diverse practices and supervision models spanning several different services including probation. These are generally used to co-ordinate and integrate all aspects of community supervision, from the initial offender needs assessment, through to programme delivery and the intended completion of the order or sentencing requirement (Partridge 2004).

TCs have been used in the US since the 1960s and combined with work release programmes to rehabilitate offenders via a supportive environment over a relatively long period. This usually encompasses the transition between the prison and working within the community (e.g. Prendergast 2011). The ethos of a TC is to focus on treatment on the whole self (and not on the drug abuse per se) and the underlying symptomatic problems in which the residents are instrumental in running the TC (Mitchell 2012a).

Cognitive behavioural approaches using programmes based on psychological theory have been employed to try and help people address their offending behaviour and generally have good support from the literature in their reduction of recidivism, but have previously excluded drug-involved offenders (e.g. Andrews 1990; Lipsey 1998; Lipsey 2007).

Miller and Rollnick developed MI as a process to motivate change in substance abusers (Miller 1991). The technique uses different strategies such as expressing empathy, avoiding arguing for change and working on ambivalence to strengthen commitment to change. Meta-analyses evidence supports the use of MI as a stand-alone treatment and in combination with more intensive programmes (e.g. Vasilaki 2006).

Why it is important to do this review

Many people have co-occurring mental illness and drug-misuse problems while under the care of the criminal justice system. While previous research has evaluated treatment programmes for offenders (more broadly), we know little about the challenges, treatment and rehabilitation opportunities for offenders with co-occurring mental health and drug-misuse problems. For this reason, we believe the evaluation of existing evidence might be helpful in identifying what treatment opportunities are available in reducing subsequent drug use and criminal activity for this vulnerable population. Where possible, the review will also report descriptively on the costs of such treatment programmes.

OBJECTIVES

To assess the effectiveness of interventions for drug-using offenders with co-occurring mental illness in reducing criminal activity or drug misuse, or both.

The review addressed the following questions:

1. Do treatments for drug-using offenders with co-occurring mental illness reduce drug use?

2. Do treatments for drug-using offenders with co-occurring mental illness reduce criminal activity?

3. Does the treatment setting (court, community, prison/secure establishment) affect the intervention outcome(s)?

4. Does the type of treatment affect the outcome(s)?

In addition, this review aimed to report on the cost and cost effectiveness of interventions.

METHODS

Criteria for considering studies for this review

Types of studies

We included randomised controlled trials (RCTs) evaluating interventions to reduce, eliminate, or prevent relapse or criminal activity, or both, in drug-using offenders with co-occurring mental illness. We defined relapse as individuals who may have returned to an incarcerated setting, or had subsequently been arrested or had relapsed back into drug misuse, or both.

Types of participants

We included drug-using offenders with co-occurring mental illness regardless of gender, age or ethnicity. Drug misuse included any study that referred to individuals using occasional, dependent or were known to abuse drugs. We defined offenders as individuals who were involved in the criminal justice system. Offenders were judged to have co-occurring mental illness where this was explicitly stated in the paper. We used several different mechanisms to identify study samples with mental health problems including; i) use of diagnostic gold standard tests such as Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) or International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) criteria, or ii) the nature of the intervention (e.g. mental health court), or iii) where the demographic participant details were described as having a 'history of psychiatric illness' or a 'serious mental disorder' with co-occurring substance misuse (or both), or a combination of these.

Types of interventions

Included interventions were designed, wholly or in part, to eliminate or prevent relapse to drug-use or criminal activity, or both, among participants. We included a range of different types of interventions in the review.

Experimental interventions included in the review

1. Case management (via mental health drug court).
2. Therapeutic communities (TC)
3. Motivational interviewing and cognitive skills

Control interventions included in the review

1. No treatment.
2. Minimal treatment.
3. Waiting list.
4. Treatment as usual.
5. Other treatment.

Types of outcome measures

Primary outcomes

For the purpose of our review, we categorised our primary outcomes into those relating to dichotomous and continuous drug use or criminal activity, or both. Where papers reported a number of different follow-up periods, we reported the longest period. We considered that such measures provided the most conservative estimate of effectiveness. For specific meta-analyses of subgroupings, we reviewed all reported follow-up periods to select the most appropriate period for combining comparable studies.

1. Drug use measures were reported as:
   i) self report drug use (unspecified drug, specific drug use not including alcohol, Addiction Severity Index Drug Composite Scores);
   ii) biological drug use (measured by drugs testing by either urine or hair analysis);
2. Criminal activity as measured by:
   i) self report or official report of criminal activity (including arrest for any offence, drug offences, re-incarceration, convictions, charges and recidivism).

Secondary outcomes

Our secondary outcome reported on cost or cost-effectiveness information. We used a descriptive narrative to describe these findings. We undertook a full critical appraisal based on the Drummond 1997 checklist for those studies with sufficient information presented.

Search methods for identification of studies

Electronic searches

The update searches identified records from 2004 to March 2013.

- Cochrane Central Register of Controlled Trials (CENTRAL) (1980 to March 2013) (Appendix 1).
- MEDLINE (1966 to March 2013) (Appendix 2).
- EMBASE (1980 to March 2013) (Appendix 3).
- PsycINFO (1978 to March 2013) (Appendix 4).
- PASCAL (1973 to November 2004)[a] (Appendix 5).
- SciSearch (Science Citation Index) (1974 to March 2013) (Appendix 5).
- Social SciSearch (Social Science Citation Index) (1972 to March 2013) (Appendix 5).
- ASSIA (1987 to March 2013) (Appendix 6).
- Wilson Applied Science and Technology Abstracts (1983 to October 2004)[a].
- Inside Conferences (1993 to November 2004)[a].
- Dissertation Abstracts (1961 to October 2004)[a].
- NTIS (1964 to March 2013).
- Sociological Abstracts (1963 to March 2013) (Appendix 7).
- HMIC (to March 2013) (Appendix 8).
- PAIS (1972 to March 2013) (Appendix 9).
- SIGLE (1980 to June 2004)[b] (Appendix 10).
- Criminal Justice Abstracts (1968 to March 2013) (Appendix 11).
- LILACS (2004 to March 2013).
- National Research Register (March 2004)[c] (Appendix 12).
- Current Controlled Trials (December 2009).
- DrugScope (February 2004) - unable to access.
- SPECTRA (March 2004)[d] (Appendix 13).

[a] Unable to access further to 2004 search.
[b] Database not updated since original 2004 search.
[c] No longer exists.
[d] Now Campbell Collaboration searched online.

To update the original review (Perry 2006), we restricted the search strategy to studies that were published or unpublished from 2004 onwards. We did not search several of the original databases for this update (indicated by the key at the end of the database list). We did not search Pascal, ASSIA, Wilson Applied Science and Technology Abstracts, Inside Conferences and Dissertation Abstracts. These databases are available only via the fee-charging DIALOG online host service. We did not have the resources to undertake these searches. The National Research Register no longer exists, and SIGLE has not been updated since 2005. DrugScope is available only to subscribing members. The original searches were undertaken by DrugScope employees.

We developed search strategies for each database to employ the search engine most effectively and to make use of any controlled vocabulary. We designed search strategies to restrict the results to RCTs and placed no language restrictions. We included methodological search filters designed to identify trials. Whenever possible, we used filters retrieved from the InterTASC Information Specialists' Sub-Group (ISSG) Search Filter Resource

site (www.york.ac.uk/inst/crd/intertasc/). If filters were unavailable from this site, we used search terms based on existing filters instead.

In addition to the electronic databases, we searched relevant Internet sites (Home Office, National Institute of Drug Abuse (NIDA) and European Association of Libraries and Information Services on Alcohol and Other Drugs (ELISAD)). We searched directory websites up to November 2011. We placed no language restrictions on identification and inclusion of studies in the review.

Details of the update search strategies and results, and of the Internet sites searched are listed in Appendix 1; Appendix 2; Appendix 3; Appendix 4; Appendix 5; Appendix 6; Appendix 7; Appendix 8; Appendix 9; Appendix 10; Appendix 11; Appendix 12; Appendix 13.

Searching other resources

Reference checking

We scrutinised the reference lists of all retrieved articles for further references. We also searched the catalogues of relevant organisations and research founders.

Personnel communication

We contacted experts and asked of their knowledge of other studies, published or unpublished, relevant to the review article.

Data collection and analysis

Selection of studies

Two review authors independently inspected the search hits by reading the titles and abstracts. We obtained each potentially relevant study located in the search as a full article and two review authors independently assessed them for inclusion. In the case of discordance, a third independent review author arbitrated. One review author undertook translation of articles not written in the English language.

The screening process was divided into two key phases. Phase one used the initial eight key questions reported in the original Perry 2006 review.

Pre-screening criteria: phase one

1. Is the document written in 2004 or later? [If "no" exclude document]
2. Is the document an empirical study? [If "no" exclude document]
3. Does the study evaluate an intervention, a component of which is designed to reduce, eliminate or prevent relapse with drug-using offenders?
4. Are the participants referred by the criminal justice system at baseline?
5. Does the study report pre- and post-programme measures of drug use?
6. Does the study report pre- and post-programme measures of criminal behaviour?
7. Does the study include a comparison group?
8. Do the outcome measures refer to the same length of follow-up for two groups?

Following identification of relevant papers from phase one, phase two screening sought to identify those papers describing offenders with a mental illness. This information was primarily obtained from the participant description and the type of intervention (e.g. mental health drug court).

Pre-screening: phase two

1. Is the study population comprised wholly of participants with diagnosed mental illness using DSM-IV or ICD-10 diagnostic criteria? [if yes, include document]
2. Is the study population comprised wholly of participants identified on screening to have a mental health problem(s) based on intervention eligibility (e.g. mental health court)? [if yes, include document]
3. Where the full study population does not comprise of offenders with diagnosed or presumed mental illness, are separate results given for those participants with mental illness? [if no, exclude document]

Drug-using interventions were implied if the programme was targeted at reducing drug use in a group of individuals or could be ascertained from the background characteristics of the group. Offenders were individuals residing in special hospitals, prisons, the community or who were diverted from court or placed on arrest referral schemes for treatment. We did accept papers in the review where the entire sample were not using drugs, but reported pre and post measures needed to be the same at both time points. The study setting could change throughout the process of the study. For example, offenders could begin in prison but progress through a work release project into a community setting. Finally, studies did not need to report both drug and criminal activity outcomes. If either of these were reported, we included the study in the review.

Data extraction and management

We used data extraction forms to standardise the reporting of data from all studies obtained as potentially relevant. Two review authors independently extracted data.

Assessment of risk of bias in included studies

Four review authors (AEP, JMG, MMSJ, MJN) independently assessed risk of bias of all included studies using the 'Risk of bias' assessment criteria recommended in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011).

The recommended approach for assessing risk of bias in studies included in Cochrane reviews is a two-part tool, addressing seven specific domains, namely sequence generation and allocation concealment (selection bias), blinding of participants and providers (performance bias), blinding of outcome assessor (detection bias), incomplete outcome data (attrition bias), selective outcome reporting (reporting bias), and other source of bias. The first part of the tool involves describing what was reported to have happened in the study. The second part of the tool involves assigning a judgement relating to the risk of bias for that entry, in terms of low, high or unclear risk. To make these judgements, we used the criteria indicated by the handbook adapted to the addiction field. See Appendix 14 for details.

The domains of sequence generation and allocation concealment (avoidance of selection bias) were addressed in the tool by a single entry for each study.

Blinding of participants, personnel and outcome assessor (avoidance of performance bias and detection bias) were considered separately for objective outcomes (e.g. drop-out, use of substance of abuse measured by urine analysis, participants relapsed at the end of follow-up, participants engaged in further treatments) and subjective outcomes (e.g. duration and severity of signs and symptoms of withdrawal, patient self reported use of substance, side effects, social functioning as integration at school or at work, family relationship).

Incomplete outcome data (avoidance of attrition bias) was considered for all outcomes except for the drop-out from the treatment, which is very often the primary outcome measure in trials on addiction.

For studies identified in the most recent search, the review authors attempted to contact study authors to establish whether a study protocol was available.

Measures of treatment effect

For outcomes measured on different scales, we used mean difference (MD) with 95% confidence intervals (CI). We presented dichotomous outcomes as risk ratios (RR), with 95% CIs.

Dealing with missing data

We attempted to contact study authors via email where missing data occurred in the original publication.

Assessment of heterogeneity

We assessed heterogeneity using the I^2 and Q statistics.

Data synthesis

We performed a series of meta-analyses using the Review Manager software (RevMan 2012) and applied random-effects models alongside a narrative review to address each of the key questions outlined in the objectives. The narrative tables included a presentation of the study details (e.g. author, year of publication and country of study origin), study methods (e.g. random assignment), participants (e.g. number in sample, age, gender, ethnicity, age, mental health status), interventions (e.g. description, duration, intensity and setting), outcomes (e.g. description, follow-up period and reporting mechanism), resource and cost information and resource savings (e.g. number of staff, intervention delivery, estimated costs and estimated savings) and notes (e.g. methodological and quality assessment information). For outcomes of criminal activity, enough data allowed us to divide this into re-arrest and re incarceration.

Subgroup analysis and investigation of heterogeneity

We conducted a subgroup analysis of re-arrest and re-incarceration and combined the TC intervention studies to allow us to examine the impact in this manner.

Sensitivity analysis

When appropriate, we planned sensitivity analyses to assess the impact of studies with high risk of bias. However, because of the overall high risk of bias of the included studies, we did not conduct this analysis.

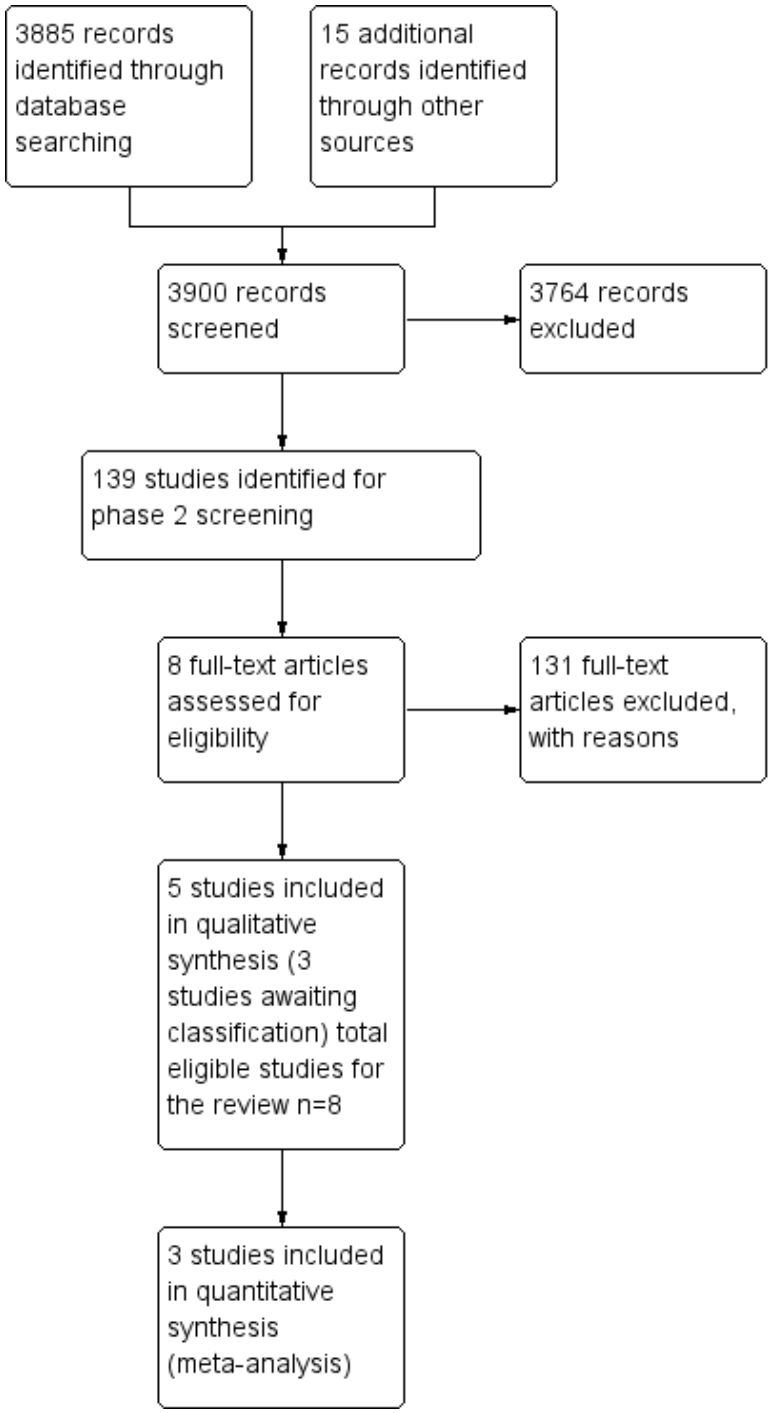
RESULTS

Description of studies

Results of the search

The updated searches to 21 March 2013 produced 3885 new records. Submissions from expert authors provided a further 15 records. An assessment of the titles and abstracts in phase one screening excluded 3761 records, leaving 139 potentially relevant RCT publications. In phase two, we excluded a further 131 papers, leaving eight trials. Three of the eight trials are awaiting classification, therefore we included data from the remaining five trials, containing 1502 participants (Figure 1).

Figure 1. Study flow diagram of paper selection process.



Included studies

- Nine publications represented five trials were published between 1999 and 2011. The five trials consisted of three singular trial publications on different interventions (Cosden 2003; Sacks 2011; Stein 2011), and two trials represented by five publications. The first trial represented an evaluation of one intervention to two comparison groups (e.g. Sacks 2004a TC; Sacks 2004b TC + AC), using different outcome measures (drug use at 12 months reported by Sullivan 2007 and crime at 12 months reported by Sacks 2004a TC; Sacks 2004b TC + AC). The second trial represented three publications and four comparisons presenting follow-up data successively between 12 and 60 months (Prendergast 2003; Prendergast 2004; Wexler 1999a; Wexler 1999b).

Treatment regimens and settings

- Four studies (representing seven comparisons) were conducted in a secure setting. The evaluations considered a TC intervention in comparison to some alternative sentencing option (Prendergast 2003; Prendergast 2004; Sacks 2004a TC; Sacks 2004b TC + AC; Sullivan 2007; Wexler 1999a; Wexler 1999b).

- Two studies were conducted in a court setting. The evaluations compared assertive case management versus treatment as usual in a mental health drug court (Cosden 2003), and MI with relaxation training with a group of adolescents with significant depression (Stein 2011).

- No studies were identified in the community.

Countries in which the studies were conducted

- All the studies were published in the US.

Duration of trials

- The trial duration varied between 3 months' follow-up (Stein 2011) to a five-year or 60-month follow-up (Wexler 1999b). The other seven comparisons reported on outcomes at 12, 24 and 36 months (Cosden 2003; Prendergast 2003; Prendergast 2004; Sacks 2004a TC; Sacks 2004b TC + AC; Sacks 2011; Sullivan 2007).

Participants

- Seven of the eight comparisons included adult drug-using offenders. One study investigated the impact of MI with adolescents aged 14 to 19 years (Stein 2011).

- Two studies included female offenders (Cosden 2003; Stein 2011). For the majority of studies, adult male offenders were the focus of the study populations with a mean age of 30 years.

- In all study populations, the majority of participants were of white ethnic origin.

- Mental health diagnoses varied across the studies (for more information see Table 1).

Excluded studies

We excluded 127 study comparisons. Reasons for exclusion included a lack of criminal justice involvement in referral to the intervention: 24 studies; not reporting relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods: 20 studies; allocation of participants to study groups that were not strictly randomised or did not contain original trial data: 11 studies. We excluded one study where follow-up periods were not equivalent across study groups (Di Nitto 2002), and one study was excluded because the intervention (acupuncture) was not included for evaluation in the present review (Berman 2004). We excluded 67 study comparisons because the study population did not include participants with a co-occurring mental illness or were not offenders. One study reported the protocol of a trial only (Baldus 2011), the other study only contained conference proceedings (Kinlock 2009). We were unable to obtain the data for one paper (Cogswell 2011).

Risk of bias in included studies

Allocation

Randomisation

All of the nine included comparisons were described as randomised. Three of the included studies reported on the randomisation sequence was generated and were judged at low risk of bias (Cosden 2003; Sacks 2011; Stein 2011). The remaining seven comparisons did not report how the randomisation sequence of participants was generated (Prendergast 2003; Prendergast 2004; Sacks 2004a TC; Sacks 2004b TC + AC; Sullivan 2007; Wexler 1999a; Wexler 1999b).

Characteristics at baseline

Six comparisons reported that groups were similar on drug-use history (Prendergast 2003; Prendergast 2004; Sacks 2004a TC; Sacks 2011; Wexler 1999b; Stein 2011), and seven comparisons reported

also on baseline criminal history (Cosden 2003; Prendergast 2003; Prendergast 2004; Sacks 2011; Sullivan 2007; Wexler 1999b; Stein 2011).

Allocation concealment

Of the nine included comparisons, only one adequately reported that the allocation process was concealed (Sacks 2011).

Blinding

Blinding was assessed across four dimensions considering performance and detection bias across subjective and objective measures (see Appendix 14). In all but one study, blinding was considered unclear on all four measures of blinding (Prendergast 2003; Prendergast 2004; Sacks 2004a TC; Sacks 2004b TC + AC; Stein 2011; Sullivan 2007; Wexler 1999a; Wexler 1999b). One study was rated at high risk of bias (Cosden 2003).

Incomplete outcome data

Loss to follow-up was reported to differing extents in all of the included studies. Of these, five were graded with partial information (Cosden 2003; Prendergast 2003; Prendergast 2004; Sacks 2011; Stein 2011), and five provided adequate information (Sacks 2004a TC; Sacks 2004b TC + AC; Sullivan 2007; Wexler 1999a; Wexler 1999b). Only two reported reasons for drop-out of participants (Wexler 1999a; Wexler 1999b).

Selective reporting

The review authors rated all nine comparisons as unclear as they could not be rated appropriately because none of the nine comparisons reported the outcomes in a pre-specified manner using the primary and secondary outcome format.

Other potential sources of bias

Of the nine comparisons, six were rated a high risk of other bias (Cosden 2003; Prendergast 2003; Prendergast 2004; Stein 2011; Wexler 1999a; Wexler 1999b). One study was rated at low risk of potential bias (Sacks 2011), and the remainder were rated as unclear (Sacks 2004a TC; Sacks 2004b TC + AC; Sullivan 2007). See Figure 2 and Figure 3 for more details.

Figure 2. Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.

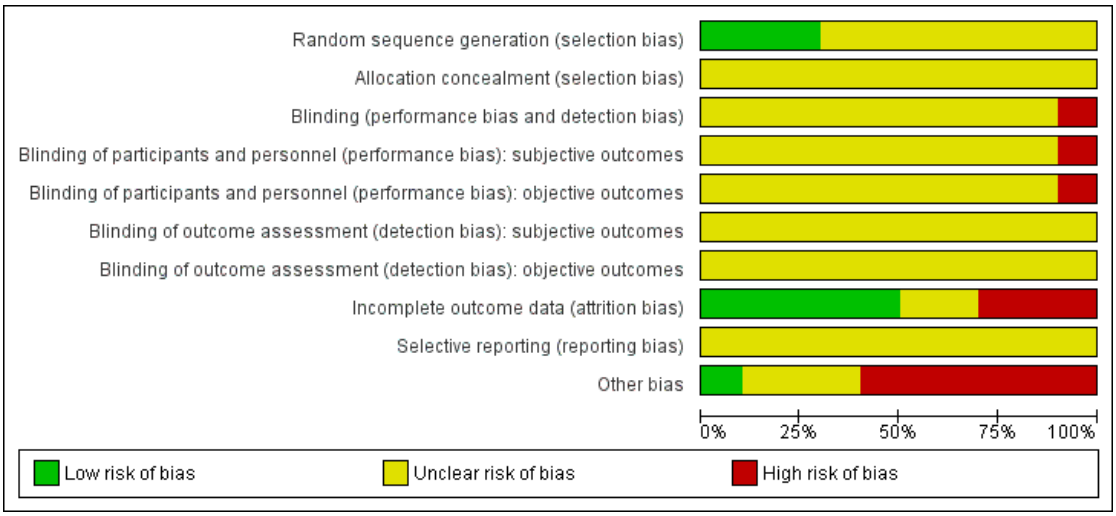
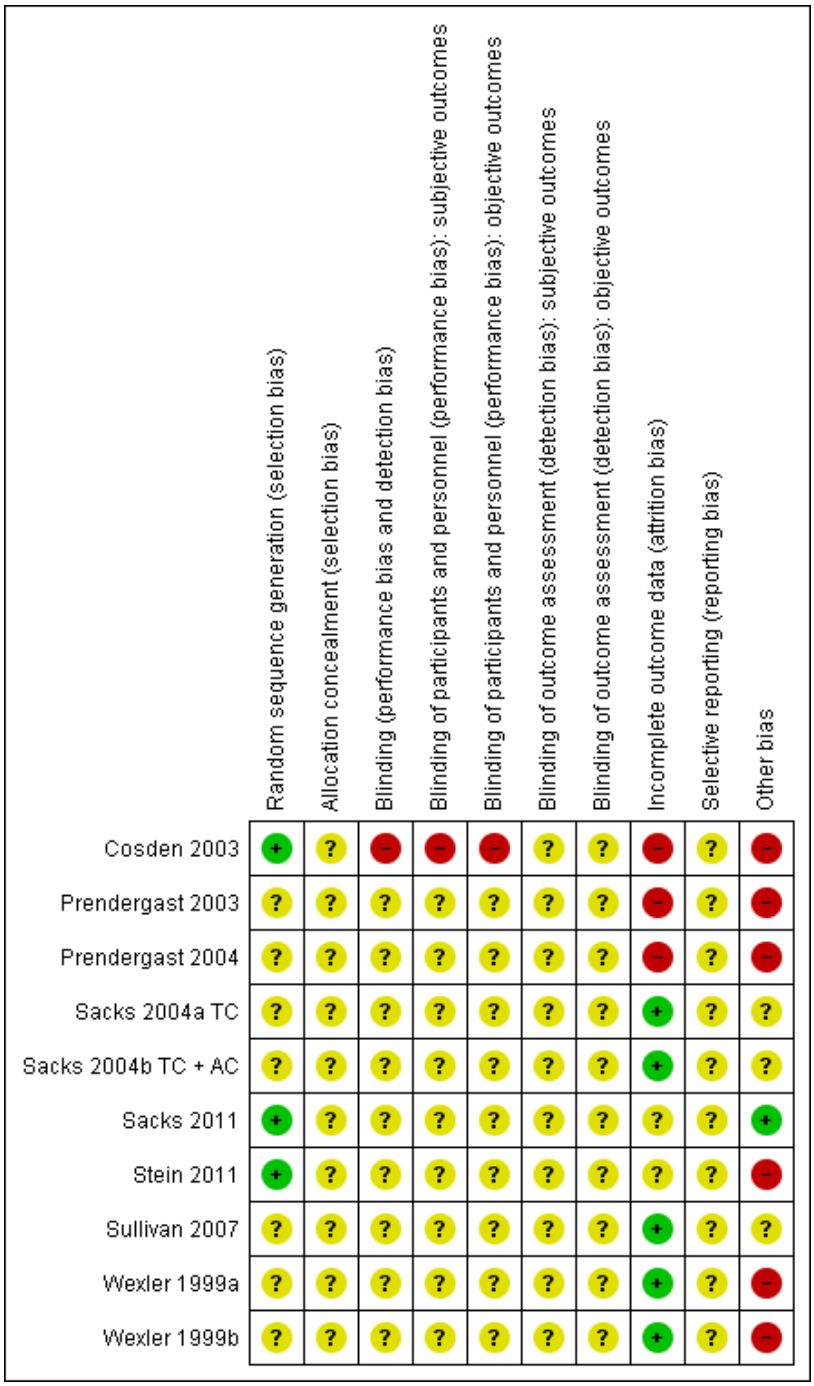


Figure 3. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.



Effects of interventions

We included five trials in a series of four meta-analyses (for more details see Table 2).

Do treatments for drug-using offenders with co-occurring mental illness reduce drug use?

For drug use, two studies found no statistically significant reduction in self report drug use (715 participants; RR 0.82, 95% CI 0.44 to 1.55) (Prendergast 2004; Sullivan 2007). The two studies were highly heterogeneous (I^2 = 80%) (Analysis 1.1).

Do treatments for drug-using offenders with co-occurring mental illness reduce criminal activity?

For the criminal activity outcomes, two studies found no statistically significant reduction in re-arrest 663 participants; RR 1.00, 95% CI 0.90 to 1.12) (Cosden 2003; Prendergast 2003). For measures of dichotomous re-incarceration, two studies demonstrated a significant reduction in the number of individuals re-incarcerated following treatment (266 participants; RR 0.40, 95% CI 0.24 to 0.67) (Analysis 2.1) (Sacks 2004a TC; Sacks 2011). For measures of continuous re-incarceration, two studies showed a significant reduction on criminal behaviour (361 participants; MD 28.72, 95% CI 5.89 to 51.54) (Analysis 2.2) (Sacks 2004a TC; Wexler 1999a).

Does the type of treatment affect the outcome(s)?

1. Therapeutic community versus treatment as usual

Impact on criminal activity

One subanalysis of two studies evaluating the impact of TC treatment found a statistically significant reduction in re-incarceration (266 participants; RR 0.29, 95% CI 0.16 to 0.54) (Analysis 3.1) (Sacks 2004a TC; Sacks 2011). One study found no statistically significant reduction in re-arrest following treatment (428 participants; RR 0.90, 95% CI 0.61 to 1.33) (Analysis 3.1) (Prendergast 2003).

2. Mental health court and case management versus treatment as usual (standard court proceedings)

Impact on self report criminal activity

One study found no statistically significant reduction in criminal activity (235 participants; RR 1.05, 95% CI 0.90 to 1.22) (Analysis 4.1) (Cosden 2003).

3. Motivational interviewing and cognitive skills versus relaxation therapy

Impact on self report drug use

One study found no statistically significant reduction in self report drug use (162 participants; MD -7.42, 95% CI -20.12 to 5.28) (Analysis 5.1) (Stein 2011).

Cost and cost effectiveness

Four papers referred to the costs or cost effectiveness of the TC programmes. The Sacks 2011 paper suggested that cost-beneficial analyses associated with each intervention in achieving the desired outcome would greatly assist how best to allocate scarce resources. The Prendergast five-year evaluation is currently involved in an economic analysis with important differences noted in the one-year AMITY outcome study suggests that optimal cost savings appear to require prison treatment plus aftercare rater than prison treatment alone (McCollister 2013). One study contained some information about the cost (but not sufficient to conduct a cost-effectiveness appraisal) (Sacks 2004a TC; Sacks 2004b TC + AC). For this intervention, the authors noted that the additional marginal costs on top of the specific incarceration costs were USD7.37 per day compared with the USD148.19 cost of a prison day. This suggests a substantial cost saving of using TCs as opposed to prison.

DISCUSSION

Summary of main results

This systematic review provided evidence from five trials, with seven comparisons included in a series of meta-analyses. The trials were conducted in secure settings and the court judicial system. We did not identify any studies that evaluated interventions for offenders in the community who were on parole or under the care of the probation service. For this reason, we do not know whether such interventions work better in one setting as opposed to another. Three different types of treatment interventions were classified across the seven comparisons. These were divided into: case management via a mental health drug court, TC and MI with cognitive skills in comparison to relaxation training. Overall, the

combined interventions were not found to reduce self report drug use, but did significantly reduce subsequent re-incarceration rates but not re-arrests. A specific subgroup analysis combining studies using TC interventions showed a statistically significant reduction in re-incarceration, but not for re-arrest. This finding also supports previous research that demonstrates that the combined effects of TC and aftercare release seem to show the most consistent and successful results. In addition (and not addressed within this review) those clients also remained in treatment for the longest period appeared to benefit most (e.g. Prendergast 2004; Sacks 2004a TC; Sacks 2004b TC + AC). No statistically significant reductions were noted for criminal activity or self report drug use with the use of case management via a mental health court or MI with cognitive skills over relaxation training (Cosden 2003; Stein 2011). In summary, the studies showed a high degree of statistical variation suggesting that caution is needed in interpretation of these results. Overall, the impact on criminal activity outcome measures varied and the differences noted between the reductions in re-incarceration but not re-arrest could be reflected in the measurement processes. For example, re-incarceration to prison is a longer process and will sometimes involve a court case; and as a numerical outcome measure is less likely to be recorded within the time frame of an experimental evaluation. In comparison, an arrest is more frequent and can be recorded onto the criminal justice system within a shorter period. Sacks 2011 also argues that participation in different treatment options does not necessarily lead to less involvement with the criminal justice system, but that the severity of the offences are reduced such that re-incarceration is less likely. The Prendergast 2003 study also commented on differential effectiveness of treatment outcomes. They argue that focusing on only one or two outcomes may mask the impact of treatment on other outcome domains that are of interest to various stakeholders. For example, measuring re-arrest or re-incarceration conceals the behaviour of treatment that may lead to an individual's return to correctional supervision. Questions that remain unanswered through such measurement include (i) the length of time an offender remains in the community until re-arrest, (ii) knowledge about what crimes are committed and (iii) the reasons for return.

In terms of addressing some of the complex issues of individuals with mental illness and co-occurring substance abuse the evidence from this systematic review provides little information. Only two studies discussed the differential treatment effects on the severity of depression (Cosden 2003; Stein 2011). The Cosden 2003 study noted that further understanding of how to help clients with serious mental illness with different levels of treatment is needed.

Several successful treatment elements were reported throughout the five trials with a number of key themes identified. First, the issue of treatment engagement was noted as important. In the mental health court trial, the informal support from family and friends had an impact in encouraging the engagement of clients within the community to longer term gain (Cosden 2003). Second, programmes that were specifically adapted to the needs of mental health clients showed improved effects in which a cognitive behavioural curriculum that emphasised criminal thinking and behaviour alongside psychoeducational classes to foster recognition and understanding of substance use, mental illness and criminality and sustained aftercare (Sacks 2004a TC). Third, the longer an individual is engaged in treatment the better the outcome(s) (Prendergast 2004).

Overall completeness and applicability of evidence

The paucity of evidence within the review is covered in three key areas: general applicability, mental health information and cost information.

General applicability

The applicability of this evidence is hindered in general by a lack of trials covering a range of different treatment options for offenders with drug misuse and co-occurring mental health problems. The trials were conducted in the US judicial system and are, therefore, limited in their generalisation to other criminal justice systems outside of the US. The current evidence suggests that TC treatment may have some effect in reducing re-incarceration rates, but we do not know how such treatment facilitates the specific rehabilitation requirements of offenders with drug misuse and mental health problems. The review only reports on self report drug use as not enough information using biological outcome measures of drug use (e.g. hair and urine analysis) was available. As a result, the self report information must be interpreted with caution. In addition, we can say nothing about whether such treatments are effective in reducing drug use and subsequent criminal behaviour while on parole or on probation in the community.

Mental health information

Although the review specifically sought to identify studies including participants with co-occurring mental illness, the study descriptions of mental ill health varied. The Cosden 2003 study used a psychiatrist or psychologist to conduct a clinical interview to identify mental health diagnosis alongside substance misuse. This resulted in a mental health court sample of individuals diagnosed with a range of mental health problems including mood disorder, schizophrenia, bipolar disorder and dual diagnosis. Other papers referred to use of the DSM-IV diagnostic criteria (e.g. Sacks 2011), but subsequently provided little information with regards to individual mental illness needs. Demographic information in the Sacks study reported on other aspects of mental health prognosis. Such examples include, lifetime mental health treatment, lifetime in patient care and prescribed medication. The Prendergast 2003 study reported a range of diagnoses including anti-social personality disorder, phobias, post-traumatic stress disorder, depression,

dysthymia and attention deficit disorder but did not describe how these diagnoses were confirmed or assessed within the population. As a result, it is difficult to identify which treatments might best benefit different types of mental health problems, for example, someone with a psychotic illness as opposed to depression may require very different treatment approaches.

Cost information

Cost information within the studies remained sparse. This lack of information allowed for little comparison of cost effectiveness between different types of drug treatment programmes. Additional time spent in programmes also raises questions about re-incarceration and days until first incarceration generating important cost-avoidance implications that require further examination. Regular report of effect sizes would aid calculations for power analysis and provide estimates of the magnitude of treatment effect needed for cost benefit and cost-effectiveness analysis.

Quality of the evidence

Overall, the assessment of risk of bias was limited by the lack of information reported in this group of trials. As a result, we rated most of the studies on the majority of risk of bias measures as unclear. In addition, a number of specific limitations were described relating to the study design (and leading to problems of selection bias) and small sample sizes. The Stein 2011 study was noted as being relatively underpowered. Replication of the study is required to enhance the generalisation and external validity of the study findings. Similar modest sample sizes were reported by Sacks 2011 and Cosden 2003, who suggested that larger samples should be used to provide a more precise estimate of effect. The Cosden 2003 study also reported on the possibility of outcome bias as the interviewer was not blind to the outcome condition for the client, and loss to follow-up (25% of the study sample were lost to follow-up) at 12 months.

Another possible selection bias was a concern in the Wexler 1999b and Prendergast 2003 studies whereby participants were randomly assigned to the prison TC and regular prison conditions but not to aftercare. The authors noted that possible differences in personal motivation may account for some of the positive outcomes associated with participants continued support for aftercare services. Subsequently these participants were noted as having the highest 'readiness scores', which suggests that motivation creates an important consideration on client selection (Prendergast 2003; Wexler 1999b).

Potential biases in the review process

Besides the limitations associated with the literature, there are also two limitations of the review methodology. Specifically the original review included an additional five fee-paying databases and one search using DrugScope. In this current review, resources did not allow such extensive searching. While the electronic database searches were updated to March 2013, the website information has only been updated to November 2011. As a result, the literature will require further extensive searching when the review is next updated.

AUTHORS' CONCLUSIONS

Implications for practice

This review highlights the paucity of evidence for drug-using offenders with co-occurring mental health problems. Two of the five trials showed some promising results for the use of therapeutic community and aftercare, but only in relation to reducing subsequent re-incarceration. Overall, the studies showed a high degree of statistical variation demonstrating a degree of caution in the interpretation of the magnitude of effect and direction of benefit for treatment outcomes. More evaluations are required to assess the effectiveness of interventions for drug-using offenders with co-occurring mental health problems.

Implications for research

This review has identified several research implications:

1. Generally good-quality research is required to evaluate the effectiveness of interventions (other than therapeutic communities) with offenders with substance-misuse problems and co-occurring mental illness. Of particular interest is the extended long-term effects of aftercare following an intervention in prison. Further research to enhance the stronger causal relationships could be resolved if participants were randomly assigned to community treatment or routine parole supervision or to a different intensity of community treatment.

2. Improved descriptions of the participants' mental health problems and more detailed information about mental health diagnoses is required to enable the transferability of information to clinical practice and development of mental health diagnoses as a moderator within the analysis of the outcomes.

3. Trial interventions specifically focusing on females and adolescents are required. In the current review, only one study contained females and one study reported on adolescents with depression.

4. Little is known about the interaction and nature of mental illness and success with different diagnoses. In terms of depression, the Stein 2011 paper attempted to explore some of the differences between participants with few and many depressive symptoms. However, future studies should consider assessing for lifetime and current major depressive disorder and other mental illnesses alongside changes in mental illness over time that might be related to intervention efforts.

5. Cost and cost-effectiveness information should be standardised within trial evaluations, which will help policy makers to decide upon health versus criminal justice costs and benefit in quality of life and mental health outcomes. Additional outcome evaluations should take into consideration the length of time to a parolees re-arrest or re-incarceration as this has implications for costs. For example, the Prendergast 2003 study found that community residential treatment kept parolees out of trouble so long as they remained in treatment. As soon as treatment was dropped (prior to the intended dose) this tended to lead to relapse or recidivism at rates equivalent to those who received prison treatment only. Such evaluations provide potential important information for stakeholders and funding bodies involved in the costing of such programmes and the associated societal costs.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Cosden 2003

Methods	Allocation: random assignment Randomisation method: adequate/low risk Similar on drug use: unknown/unclear risk Similar on criminal activity: yes Blinding methodology: high risk Loss to follow-up: partial/high risk
Participants	235 adults Age not reported 50.2% male 70.6% European American Drug use not reported Alcohol use not reported 100% psychiatric history Eligibility criteria: adults charged with a crime or misdemeanour who were booked into county jail, had at least 1 prior booking and were diagnosed with a serious and pervasive mental illness and were residents of the county involved. Pre-plea participants were required to have no previous offences involving violence; post-adjudication participants with prior violence were eligible if they were considered to no longer pose a threat
Interventions	Court-based sentencing and case management intervention vs. treatment as usual (I) MHTC and ACT case management (n = 137) vs. (C) treatment as usual (n = 98) (I) received weekly or bi-weekly court supervision and frequent contact with case managers, duration 18 months, followed by treatment as usual if required C received traditional court proceedings and county mental health services as usual for at least 18 months, which was less intensive than (I)
Outcomes	Drug use (Addiction Severity Index, self report) during the last 1 month at 12 months' follow-up
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number table
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding (performance bias and detection bias) All outcomes	High risk	The interviewer was not blind to the condition of the client

Cosden 2003 (*Continued*)

Blinding of participants and personnel (performance bias) subjective outcomes	High risk	The interviewer was not blind to the condition of the client
Blinding of participants and personnel (performance bias) objective outcomes	High risk	The interviewer was not blind to the condition of the client
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information available
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information available
Incomplete outcome data (attrition bias) All outcomes	High risk	25% of the initial population could not be relocated at the end of 12 months
Selective reporting (reporting bias)	Unclear risk	Not reported
Other bias	High risk	The relatively small number of clients in each group resulted in chance variation on some of the intake measures. Generalisability issues and concerns about self report measures and validity

Prendergast 2003

Methods	Allocation: random assignment Randomisation method: unclear risk Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: unknown/unclear Loss to follow-up: partial/high risk
Participants	715 adults Mean age 30.9 years 100% male 37.8% white 100% drug-using 100% psychiatric history Eligibility criteria: male inmates
Interventions	Prison/secure establishment-based TC, counselling and aftercare vs. treatment as usual

Prendergast 2003 (*Continued*)

Outcomes	Arrest for any offence (self report), arrest for a drug offence (self report), incarceration for any offence (official records) 12-months post release	
Notes		
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Random assignment and stratified for equal ethnic proportions". Method not stated
Allocation concealment (selection bias)	Unclear risk	Concealment method not stated
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information reported
Incomplete outcome data (attrition bias) All outcomes	High risk	74% of the original sample were included in the follow-up
Selective reporting (reporting bias)	Unclear risk	No information reported
Other bias	High risk	Only the prison phase was randomised. Aftercare was voluntary and participants self selected. Concerns about prison drop-outs and completers p.87

Prendergast 2004

Methods	Allocation: random assignment Randomisation method: unclear risk Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: unknown/unclear risk Loss to follow-up: partial/high risk
Participants	715 adults Mean age 30.9 years (SD 7.4) 100% male 37.8% white 100% drug-using Alcohol use not reported 100% psychiatric history Eligibility criteria: offenders with a drug problem who were 9-14 months from parole. Offenders convicted of arson or sexual crimes to minors were not eligible
Interventions	Secure establishment-based TC vs. no treatment. (I) Amity TC and voluntary residential aftercare vs. (C) waiting-list control (I) TC included a 2- to 3-month orientation phase, a 5- to 6-month treatment stage, and a 1- to 3-month re-entry phase; total duration 12 months. (I) included need assessment, education, group work, counselling and prison industry jobs. (I) aftercare duration up to 12 months (C) duration not applicable
Outcomes	Incarceration (official records) during the last 60 months at 60 months' follow-up Drug use (self report) during the last 60 months at 60 months' follow-up
Notes	5-year follow-up to Wexler 1999a and Wexler 1999b

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	"Random assignment and stratified for equal ethnic proportions". Method not stated
Allocation concealment (selection bias)	Unclear risk	Concealment method not stated
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information reported

Prendergast 2004 (*Continued*)

Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information reported
Incomplete outcome data (attrition bias) All outcomes	High risk	74% of the original sample were included in the follow-up
Selective reporting (reporting bias)	Unclear risk	No information reported
Other bias	High risk	Only the prison phase was randomised. Aftercare was voluntary and participants self selected. See comments above for Prendergast 2003

Sacks 2004a TC

Methods	Allocation: random assignment Randomisation method: unclear Similar on drug use: no Similar on criminal activity: yes Blinding methodology: unknown/unclear risk Loss to follow-up: adequate/low risk
Participants	236 adults Mean age 34.3 years (SD 8.8) 100% male 49% white 100% drug-using 32% alcohol-using 100% psychiatric history Eligibility criteria: prisoners who had both a serious mental disorder and a substance-use disorder
Interventions	Secure establishment-based TC vs. treatment as usual (I) Personal reflections TC and voluntary residential aftercare (n = 142) vs. (C) mental health programme (n = 94) (I) TTC included psychoeducational classes, cognitive behavioural methods, medication and group therapy. Activities were attended 5 days per week for 4-5 hours per day with the rest of the day spent working in the prison; duration 12 months. (I) Aftercare included mental health counselling, medication and psychiatric services and basic skills. Activities

	were attended 3-7 days per week for 3-5 hours per day; duration 6 months (C) Programme included intensive psychiatric services with medication, weekly individual therapy and counselling and specialised groups of cognitive behavioural work, anger management, therapy and education, domestic violence, parenting and weekly drug/alcohol therapy with a 72-hour course on substance abuse education and relapse prevention; duration 12 months
Outcomes	Criminal activity regarding a new offence (official records) during the last 12 months at 12 months follow-up Incarceration for a new offence (official records) during the last 12 months at 12 months follow-up
Notes	Drug use activity at 12-months reported in Sullivan 2007

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Noted as "randomly assigned" on p. 3, no other information provided
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No information about blinding provided
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information about blinding provided
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information about blinding provided
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information about blinding provided
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information about blinding provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT analysis performed. Missing data imputation reported
Selective reporting (reporting bias)	Unclear risk	No information reported

Sacks 2004a TC (*Continued*)

Other bias	Unclear risk	There was a large amount of crossover between the treatment and intervention groups. The cross-overs were removed from the analysis leaving unequal sample sizes p. 482. Difficult to assess to what extent this has caused a threat to validity within the study

Sacks 2004b TC + AC

Methods	Allocation: random assignment Randomisation method: unclear Similar on drug use: no Similar on criminal activity: yes Blinding methodology: unknown/unclear risk Loss to follow-up: adequate/low risk
Participants	236 adults Mean age 34.3 years (SD 8.8) 100% male 49% white 100% drug-using 32% alcohol-using 100% psychiatric history Eligibility criteria: prisoners who have both a serious mental disorder and a substance-use disorder
Interventions	Secure establishment-based TC vs. treatment as usual (I) Personal reflections TC and voluntary residential aftercare (n = 142) vs. (C) mental health programme (n = 94) (I) TTC included psychoeducational classes, cognitive behavioural methods, medication and group therapy. Activities were attended 5 days per week for 4-5 hours per day with the rest of the day spent working in the prison; duration 12 months. (I) aftercare included mental health counselling, medication and psychiatric services and basic skills. Activities were attended 3-7 days per week for 3-5 hours per day; duration 6 months (C) Programme included intensive psychiatric services with medication, weekly individual therapy and counselling, and specialised groups of cognitive behavioural work, anger management, therapy and education, domestic violence, parenting and weekly drug/alcohol therapy with a 72-hour course on substance abuse education and relapse prevention; duration 12 months
Outcomes	Criminal activity regarding a new offence (official records) during the last 12 months at 12 months' follow-up Incarceration for a new offence (official records) during the last 12 months at 12 months' follow-up
Notes	Drug use activity at 12-months reported in Sullivan 2007

Sacks 2004b TC + AC (*Continued*)

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Noted as "randomly assigned" on p. 3, no other information provided
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No information about blinding provided
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information about blinding provided
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information about blinding provided
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information about blinding provided
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information about blinding provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	ITT analysis performed. Missing data imputation reported
Selective reporting (reporting bias)	Unclear risk	No information provided
Other bias	Unclear risk	There was a large amount of cross-over between the treatment and intervention groups. The cross-overs were removed from the analysis leaving unequal sample sizes p. 482. Difficult to assess to what extent this has caused a threat to validity within the study

Sacks 2011

Methods	Allocation: random assignment Randomisation method: random number list Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: open label - no blinding Loss to follow-up: unclear risk
Participants	127 adults Mean age 38.2 years (SD 9.9) 100% male 56% white 100% co-occurring substance use and mental illness Alcohol use unknown 61.8% with clinical level of psychological distress as measured by Global Severity Index Eligibility criteria: male, diagnosed with co-occurring mental and substance-use disorders, had participated in 1 of 2 prison substance-abuse treatment programmes, were approved for placement in a community corrections facility, were accepted by the provider agency for placement in a community corrections facility
Interventions	Secure establishment based TC vs. parole supervision case management (I) re-entry modified TC (n = 71) vs. (C) parole supervision case management (n = 56) (I) was a residential programme of 6 months' duration. Formal programme activities 3-7 days per week, 3-5 hours each day. Participants had progressively increasing independence, eventually being responsible for providing counsel, guidance and coaching for new members. Participants also worked in the community and saved money for independent living. There were weekly group psycho-educational classes to address the inter-relationship between mental disorders and substance abuse, as well as various other group and individual counselling sessions. Medication monitoring and psychiatric services were on site. Participants were given assistance with housing and encouragement for employment (C) participants were released to a community corrections facility, and left the facility during the day to go to work, have treatment and report to parole officers. The intervention consisted of outreach and engagement activities, brokering community-based services, and direct provision of support and counselling services. There was a weekly relapse prevention group and daily medication monitoring. Psychiatric and substance-abuse services were provided by outside agencies (client helped to choose by community parole officers). Unlike in the intervention, criminal thinking and behaviour were not specifically addressed. The average participant attended 1 group per week and had monthly psychiatric assessment
Outcomes	Rate of re-incarceration, number of days until re-incarceration, involvement in self reported criminal activity, number of days until self reported criminal activity. Alcohol and drug offences (self reported) %. Other offences (self reported) %. All at 12 months post prison release
Notes	

Risk of bias

Sacks 2011 (*Continued*)

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number list
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	"Open-label trial", no blinding possible
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	"Open-label trial", no blinding possible
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	"Open label trial", no blinding possible
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information about blinding presented
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information about blinding presented
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Some partial loss to follow-up
Selective reporting (reporting bias)	Unclear risk	Not reported
Other bias	Low risk	No other obvious concerns with the study

Stein 2011

Methods	Allocation: random assignment Randomisation method: random numbers table Similar on drug use: yes Similar on criminal activity: unknown/unclear risk Blinding methodology: unclear/unknown Loss to follow-up: partial/unclear risk
Participants	189 adolescents Mean age 17.12 years (SD 1.10). Range 14-19 years 85.7% male 32.8% white 88.9% marijuana use

	63% alcohol use 68.5% had significant depressive symptomatology during past week at baseline (CES-D) Eligibility criteria: 14-19 years old, sentenced to juvenile correctional facility for 4-12 months, engaged in at least monthly marijuana use or binge-drinking in the year before incarceration, used any alcohol or marijuana in the month prior to incarceration (or prior to the offence leading to incarceration)
Interventions	Secure establishment based MI intervention vs. relaxation treatment (I) MI (n = 96) vs. (C) relaxation training (n = 85) (I) was MI intervention designed specifically to reduce substance use and its associated risks and consequences. Consisted of 90-minute baseline intervention and 60-minute booster intervention within 2 weeks of release (C) consisted of 90-minute baseline and 60-minute booster intervention, and involved relaxation techniques as well as advice on risky behaviours associated with substance use
Outcomes	Mean number of joints per day and mean percentage of days used marijuana at 3 months
Notes	Results presented for both high and low depressive symptom scores. Results used in this review are for those identified as having high depressive symptomatology Appears to be same study population as Stein 2011b

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	"Random assignment using a random number table"
Allocation concealment (selection bias)	Unclear risk	"Random number was placed in an envelope and opened by research staff after the baseline assessment"
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Researchers were blind until after the baseline assessment. Participants were not blinded
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	Researchers were blind until after the baseline assessment. Participants were not blinded
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	Researchers were blind until after the baseline assessment. Participants were not blinded
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	Follow-up assessments at 3 months were completed blind by the researchers but not at any other time point

Stein 2011 (*Continued*)

Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	Follow-up assessments at 3 months were completed blind by the researchers but not at any other time point
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Some attrition lost particularly for those individuals with more severe depression
Selective reporting (reporting bias)	Unclear risk	Limited information
Other bias	High risk	Underpowered and small sample size, with a brief follow-up period and concerns about self report measures

Sullivan 2007

Methods	Allocation: random assignment Randomisation method: unclear Similar on drug use: no Similar on criminal activity: yes Blinding methodology: unknown/unclear risk Loss to follow-up: adequate/low risk
Participants	236 adults Mean age 34.3 years (SD 8.8) 100% male 49% white 100% drug-using 32% alcohol-using 100% psychiatric history Eligibility criteria: prisoners who had both a serious mental disorder and a substance-use disorder
Interventions	Secure establishment-based TC vs. treatment as usual (I) Personal reflections TC and voluntary residential aftercare (n = 142) vs. (C) mental health programme (n = 94) (I) TTC included psycho-educational classes, cognitive behavioural methods, medication and group therapy. Activities were attended 5 days per week for 4-5 hours per day with the rest of the day spent working in the prison; duration 12 months. (I) Aftercare included mental health counselling, medication and psychiatric services and basic skills. Activities were attended 3-7 days per week for 3-5 hours per day; duration 6 months (C) Programme included intensive psychiatric services with medication, weekly individual therapy and counselling and specialised groups of cognitive behavioural work, anger management, therapy and education, domestic violence, parenting and weekly drug/alcohol therapy with a 72-hour course on substance-abuse education and relapse prevention; duration 12 months
Outcomes	Drug use (self report) at 12 months

Notes	Criminal activity outcomes at 12 months reported in Sacks 2004	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Participants were randomly assigned p. 824
Allocation concealment (selection bias)	Unclear risk	Method of concealment not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No information on blinding reported
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information on blinding reported
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information on blinding reported
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information on blinding reported
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information on blinding reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	Some difference between the groups. At follow-up, 82% for the (I) group and 69% for the (C). ITT was performed and missing data computated
Selective reporting (reporting bias)	Unclear risk	Limited information
Other bias	Unclear risk	No other obvious concerns with the study but difficult to assess

Wexler 1999a

Methods	Allocation: random assignment Randomisation method: unclear/unknown Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: unknown/unclear risk Loss to follow-up: adequate/low risk
Participants	715 adults Mean age 30.9 years (SD 7.4) 100% male 37.8% white 100% drug-using Alcohol use not reported 100% psychiatric history Eligibility criteria: offenders with a drug problem who were 9-14 months from parole. Offenders convicted of arson or sexual crimes to minors were not eligible
Interventions	Secure establishment-based TC vs. no treatment (I) Amity TC and voluntary residential aftercare (n = 247) vs. (C) waiting-list control (n = 290) (I) TC included a 2- to 3-month orientation phase, a 5- to 6-month treatment stage, and a 1- to 3-month re-entry phase; total duration 12 months. (I) included need assessment, education, group work, counselling and prison industry jobs. (I) aftercare duration up to 12 months (C) Duration not applicable
Outcomes	Incarceration (official records) during the last 12 months at 12 months' follow-up Incarceration (official records) during the last 24 months at 24 months' follow-up
Notes	36-month follow-up outcome in Wexler 1999b and 5-year outcomes in Prendergast 2004

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	It was noted that the participants were 'randomly' assigned and stratified by ethnic makeup. Randomisation only occurred to the TC and not to aftercare
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No blinding was conducted
Blinding of participants and personnel (performance bias)	Unclear risk	No information on blinding was provided

Wexler 1999a (*Continued*)

subjective outcomes		
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information on blinding was provided
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information on blinding was provided
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information on blinding was provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	Outcomes for the first 12 months post-release were obtained for all 715 participants, and 12 months were obtained for 263 participants at risk for 24 months at time of record review
Selective reporting (reporting bias)	Unclear risk	Information not reported
Other bias	High risk	Only the prison phase was randomised. Aftercare was voluntary and participants self selected. Concerns about bias in self selection processes p.164-165

Wexler 1999b

Methods	Allocation: random assignment Randomisation method: unclear/unknown risk Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: unknown/unclear risk Loss to follow-up: adequate/low risk
Participants	715 adults Mean age 30.9 years (SD 7.4) 100% male 37.8% white 100% drug-using Alcohol use not reported 100% psychiatric history Eligibility criteria: offenders with a drug problem who were 9-14 months from parole. Offenders convicted of arson or sexual crimes to minors were not eligible

Wexler 1999b (*Continued*)

Interventions	Secure establishment-based TC vs. no treatment (I) Amity TC and voluntary residential aftercare (n = 247) vs. (C) waiting-list control (n = 290) (I) TC included a 2- to 3-month orientation phase, a 5- to 6-month treatment stage, and a 1- to 3-month re-entry phase; total duration 12 months. (I) Included need assessment, education, group work, counselling and prison industry jobs. (I) aftercare duration up to 12 months (C) Duration not applicable
Outcomes	Incarceration (official records) during the last 36 months at 36 months' follow-up
Notes	12- and 24-month follow-up outcome in Wexler 1999a and 5-year outcomes in Prendergast 2004

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	It was noted that the participants were 'randomly' assigned and stratified by ethnic makeup. Randomisation only occurred to the TC and not to aftercare
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No blinding was conducted
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information on blinding was provided
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information on blinding was provided
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information on blinding was provided
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information on blinding was provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	Outcomes for the first 12 months post-release were obtained for all 715 participants, and 12 months were obtained for 263 par-

Wexler 1999b (*Continued*)

		ticipants at risk for 24 months at time of record review
Selective reporting (reporting bias)	Unclear risk	Information not reported
Other bias	High risk	The study design did not randomly assign inmates to the aftercare. Concerns about bias in self selection processes, pp.164-5

ACT: assertive community treatment; CES-D: Center for Epidemiologic Studies Depression Scale; (C): control; (I): intervention; ITT: intention to treat; MHTC: mental health treatment court; MI: motivational interviewing; SD: standard deviation; TC: therapeutic community.

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Alemi 2010	Study population did not have co-occurring mental illness
Alessi 2011	Not original RCT. Data are from previous, older studies
Anglin 1999	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Awgu 2010	No relevant outcomes reported
Baldus 2011	Study protocol only
Banks 2004	Study population did not have co-occurring mental illness
Berman 2004	The intervention was not appropriate for inclusion
Brady 2010	Not RCT
Braithwaite 2005	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Britt 1992a	Study population did not have co-occurring mental illness
Britt 1992b	Study population did not have co-occurring mental illness
Britt 1992c	Study population did not have co-occurring mental illness

(*Continued*)

Britt 1992d	Study population did not have co-occurring mental illness
Brown 2001	3-arm study in which only 2 arms were randomised - 1 treatment arm and control arm. Results presented as both treatment arms combined vs. control
Carr 2008	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention
Carroll 2006	Study population did not have co-occurring mental illness
Carroll 2011	Not offender population
Chandler 2006	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Cogswell 2011	Paper not available
Cornish 1997	Study population did not have co-occurring mental illness
Cosden 2005	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Coviello 2010	Study population did not have co-occurring mental illness
Coviello 2010b	Study population did not have co-occurring mental illness
Cropsey 2011	Study population did not have co-occurring mental illness
Cusack 2010	Not a drug use intervention
Dakof 2010	Study population is mothers of offenders, not offenders themselves
Dembo 2000	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods The follow-up periods reported for the different groups were not equivalent
Deschenes 1994	Study population did not have co-occurring mental illness
Di Nitto 2002	The follow-up periods reported for the different groups were not equivalent
Diamond 2006	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Dolan 2003	Study population did not have co-occurring mental illness
Dugan 1998	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods

(*Continued*)

Forsberg 2011	Study population did not have co-occurring mental illness
Freudenberg 2010	Study population did not have co-occurring mental illness
Gagnon 2010	Not offender population
Gil 2004	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Gordon 2008	Study population did not have co-occurring mental illness
Gottfredson 2002	Study population did not have co-occurring mental illness
Gottfredson 2003	Study population did not have co-occurring mental illness
Gottfredson 2005	Study population did not have co-occurring mental illness
Gottfredson 2006	Study population did not have co-occurring mental illness
Grohman 2002	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Guydish 2011	Study population did not have co-occurring mental illness
Haapanen 2002	Study population did not have co-occurring mental illness
Haasen 2010	Not offender population
Hall 2009a ST vs. DT	Study population did not have co-occurring mental illness
Hall 2009b ST vs. TP	Study population did not have co-occurring mental illness
Hanlon 1999	Study population did not have co-occurring mental illness
Harrell 2001	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Henderson 2010	No relevant outcomes reported
Henggeler 1991	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Henggeler 1999	Study population did not have co-occurring mental illness
Henggeler 2002	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods

(*Continued*)

Henggeler 2006a FC vs. DC	Study population did not have co-occurring mental illness
Henggeler 2006b FCvDCMST	Study population did not have co-occurring mental illness
Hser 2011	Unclear if study looks at offender population
Inciardi 2004	Some participants were not randomly selected into the treatment groups
Jain 2011	Paper not available and not clear from abstract if looks at offender population
Johnson 2011	Study population did not have co-occurring mental illness
Katz 2007	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention
Kinlock 2005	Study population did not have co-occurring mental illness
Kinlock 2007	Study population did not have co-occurring mental illness
Kinlock 2008	Study population did not have co-occurring mental illness
Kinlock 2009	Conference proceedings only
Kinlock 2009a CO vs. CT	Study population did not have co-occurring mental illness
Kinlock 2009b CO vs. CM	Study population did not have co-occurring mental illness
Liddle 2011	No relevant outcomes reported
Lobmaier 2010	Study population did not have co-occurring mental illness
Lobmann 2007	Study population did not have co-occurring mental illness
Magura 2009	Study population did not have co-occurring mental illness
Marlowe 2003	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Marlowe 2005	Study population did not have co-occurring mental illness
Marlowe 2007	Participants randomised to receive treatment were not randomised into the different treatment subgroups (selected by level of risk)
Marlowe 2008	Study population did not have co-occurring mental illness
Martin 1993	Study population did not have co-occurring mental illness

(*Continued*)

Mbilinyi 2011	Participants not recruited through criminal justice system
McCollister 2009a	Study population did not have co-occurring mental illness
McCollister 2009b	Study population did not have co-occurring mental illness
McCollister 2009c	Study population did not have co-occurring mental illness
McKendrick 2007	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Messina 2000	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Milloy 2011	Relevant results from original RCT not reported here
Needels 2005	The population of the study was not 100% drug- using offenders that were specifically referred by the criminal justice system to the intervention
Nemes 1998	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Nemes 1999	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Nielsen 1996	Study population did not have co-occurring mental illness
Nosyk 2010	Not offender population
Petersilia 1992a	Study population did not have co-occurring mental illness
Petersilia 1992b	Study population did not have co-occurring mental illness
Petersilia 1992c	Study population did not have co-occurring mental illness
Petersilia 1992d	Study population did not have co-occurring mental illness
Petersilia 1992e	Study population did not have co-occurring mental illness
Petersilia 1992f	Study population did not have co-occurring mental illness

(*Continued*)

Petersilia 1992g	Study population did not have co-occurring mental illness
Petry 2011	Not offender population
Polsky 2010	Not offender population
Prendergast 2008a STVSDT	Study population did not have co-occurring mental illness
Prendergast 2008b STVSTP	Study population did not have co-occurring mental illness
Prendergast 2009	No relevant outcomes reported
Prendergast 2011	Study population did not have co-occurring mental illness
Proctor 2012	Study population did not have co-occurring mental illness
Reimer 2011	Not offender population
Robertson 2006	The population of the study was not 100% drug- using offenders that were specifically referred by the criminal justice system to the intervention
Rosengard 2008	No relevant outcomes reported
Rossman 1999	Study population did not have co-occurring mental illness
Rowan-Szal 2005	Paper not available and not clear from abstract if looks at offenders
Rowan-Szal 2009	Not RCT
Rowe 2007	The population of the study was not 100% drug- using offenders that were specifically referred by the criminal justice system to the intervention
Sacks 2008	Study population did not have co-occurring mental illness
Sanchez-Hervas 2010	Paper not available and not clear from abstract if looks at offenders
Schwartz 2006	Not offender population
Sheard 2009	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Siegal 1999	Not RCT
Smith 2010	Study population did not have co-occurring mental illness
Stanger 2009	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention

(*Continued*)

Staton-Tindall 2009	No control group
Stein 2010	Not offender population
Stevens 1998	The study did not include an appropriate comparison group The population of the study was not 100% drug- using offenders that were specifically referred by the criminal justice system to the intervention
Svikis 2011	Not clear if offender population
Taxman 2006	Study population did not have co-occurring mental illness
Thanner 2003	Study population did not have co-occurring mental illness
Wang 2010	Participants not in criminal justice system
White 2006	Randomisation broken as 40% of control arm were allowed to receive treatment (acupuncture) outside of the intervention
Williams 2011	Not RCT
Winstanley 2011	Not clear if offender population
Witkiewitz 2010	Not clear if offender population
Zlotnick 2009	Study population did not have co-occurring mental illness

RCT: randomised controlled trial.

Characteristics of studies awaiting assessment *[ordered by study ID]*

Burdon 2013

Methods	Allocation: random assignment Randomisation method: not yet assessed Similar on drug use: not yet assessed Similar on criminal activity: not yet assessed Blinding methodology: not yet assessed Loss to follow-up: not yet assessed
Participants	143 female inmates 0% male (all female) % white % drug-using Alcohol use not yet assessed

Burdon 2013 (*Continued*)

	Eligibility criteria: not yet assessed
Interventions	12-week prison-based intensive outpatient drug treatment or standard treatment plus positive behavioural reinforcement
Outcomes	Depression Criminal thinking Treatment participation and progress Treatment satisfaction Psychosocial functioning
Notes	

Lee 2011

Methods	Allocation: random assignment Randomisation method: not yet assessed Similar on drug use: not yet assessed Similar on criminal activity: not yet assessed Blinding methodology: not yet assessed Loss to follow-up: not yet assessed
Participants	24 inmates 100% male % white % drug-using Alcohol use not yet assessed Eligibility criteria: incarcerated individuals with a history of substance abuse
Interventions	Mindfulness-based relapse prevention vs. treatment as usual
Outcomes	Drug-use identification disorders Drug avoidance self efficacy scale Positive and negative outcome expectancies Beck Depression Inventory
Notes	

Wolff 2012

Methods	Allocation: random assignment - open trial Randomisation method: not yet assessed Similar on drug use: not yet assessed Similar on criminal activity: not yet assessed Blinding methodology: not yet assessed Loss to follow-up: not yet assessed
Participants	74 female inmates 0% male (all female) % white % drug-using Alcohol use not yet assessed Eligibility criteria: incarcerated women with axis I mental health disorder of post-traumatic stress disorder and substance-use disorder who self referred for speciality trauma treatment
Interventions	Cognitive behavioural therapy - Seeking Safety vs. standard treatment
Outcomes	Not yet assessed
Notes	

DATA AND ANALYSES

Comparison 1. Self report drug use

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Self report drug use dichotomous	2	715	Risk Ratio (M-H, Random, 95% CI)	0.82 [0.44, 1.55]

Comparison 2. Criminal activity

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Criminal activity dichotomous	4		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.1 Re-arrests	2	663	Risk Ratio (M-H, Random, 95% CI)	1.00 [0.90, 1.12]
1.2 Re-incarceration	2	266	Risk Ratio (M-H, Random, 95% CI)	0.40 [0.24, 0.67]
2 Criminal activity continuous	2	361	Mean Difference (IV, Random, 95% CI)	28.72 [5.89, 51.54]

Comparison 3. Therapeutic community

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Criminal activity	3		Odds Ratio (M-H, Random, 95% CI)	Subtotals only
1.1 Re-arrests	1	428	Odds Ratio (M-H, Random, 95% CI)	0.90 [0.61, 1.33]
1.2 Re-incarceration	2	266	Odds Ratio (M-H, Random, 95% CI)	0.29 [0.16, 0.54]

Comparison 4. Mental health court

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Self report dichotomous criminal activity	1	235	Risk Ratio (M-H, Random, 95% CI)	1.05 [0.90, 1.22]

Comparison 5. Motivational interviewing and cognitive skills

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Self report drug use	1	162	Mean Difference (IV, Random, 95% CI)	-7.42 [-20.12, 5.28]

Analysis 1.1. Comparison 1 Self report drug use, Outcome 1 Self report drug use dichotomous.

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 1 Self report drug use

Outcome: 1 Self report drug use dichotomous

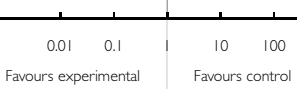
Study or subgroup	Experimental n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Weight	Risk Ratio M-H,Random,95% CI
Prendergast 2004	85/341	53/235		54.3 %	1.11 [0.82, 1.49]
Sullivan 2007	19/75	28/64		45.7 %	0.58 [0.36, 0.93]
Total (95% CI)	**416**	**299**		**100.0 %**	**0.82 [0.44, 1.55]**

Total events: 104 (Experimental), 81 (Control)

Heterogeneity: $Tau^2 = 0.17$; $Chi^2 = 5.06$, df = 1 (P = 0.02); $I^2 = 80\%$

Test for overall effect: Z = 0.61 (P = 0.54)

Test for subgroup differences: Not applicable

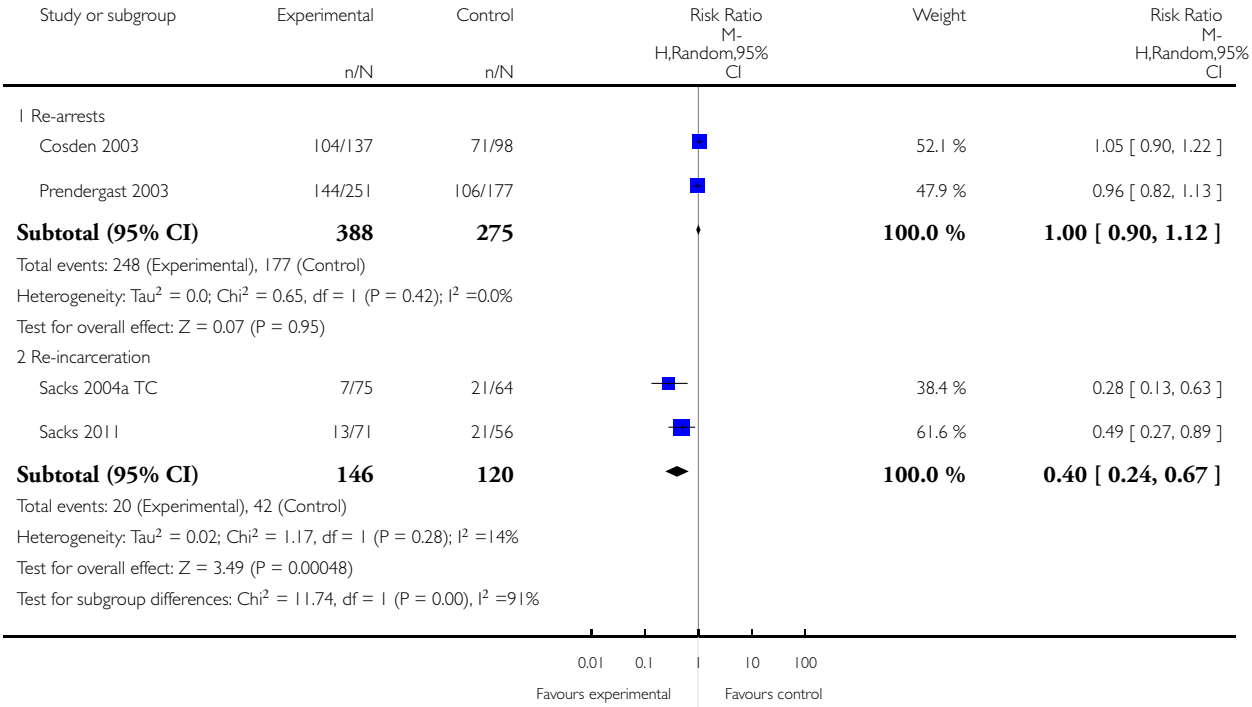


Analysis 2.1. Comparison 2 Criminal activity, Outcome 1 Criminal activity dichotomous.

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 2 Criminal activity

Outcome: 1 Criminal activity dichotomous

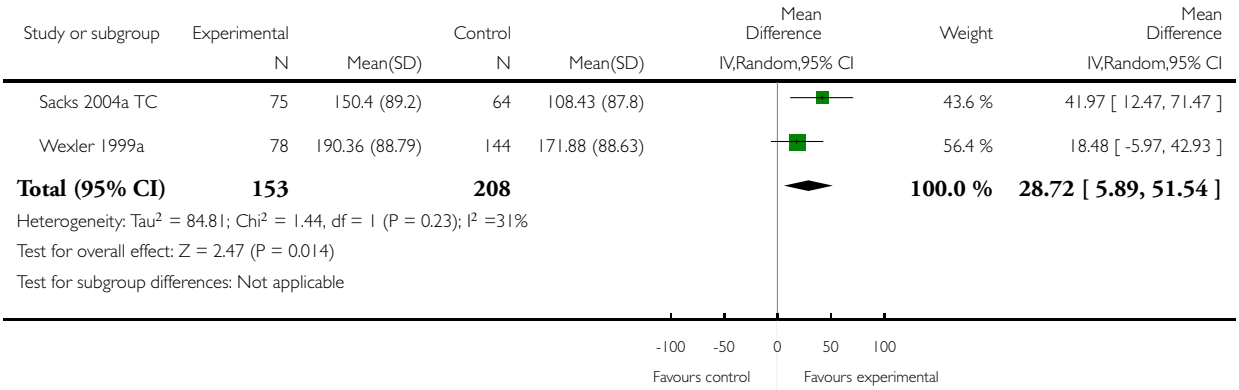


Analysis 2.2. Comparison 2 Criminal activity, Outcome 2 Criminal activity continuous.

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 2 Criminal activity

Outcome: 2 Criminal activity continuous



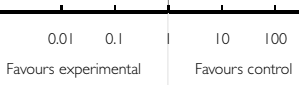
Analysis 3.1. Comparison 3 Therapeutic community, Outcome 1 Criminal activity.

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 3 Therapeutic community

Outcome: 1 Criminal activity

Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H,Random,95% CI	Weight	Odds Ratio M-H,Random,95% CI
1 Re-arrests					
Prendergast 2003	144/251	106/177		100.0 %	0.90 [0.61, 1.33]
Subtotal (95% CI)	**251**	**177**		**100.0 %**	**0.90 [0.61, 1.33]**
Total events: 144 (Experimental), 106 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.52 (P = 0.60)					
2 Re-incarceration					
Sacks 2004a TC	7/75	21/64		42.7 %	0.21 [0.08, 0.54]
Sacks 2011	13/71	21/56		57.3 %	0.37 [0.17, 0.84]
Subtotal (95% CI)	**146**	**120**		**100.0 %**	**0.29 [0.16, 0.54]**
Total events: 20 (Experimental), 42 (Control)					
Heterogeneity: Tau^2 = 0.0; Chi^2 = 0.82, df = 1 (P = 0.36); I^2 =0.0%					
Test for overall effect: Z = 3.93 (P = 0.000083)					
Test for subgroup differences: Chi^2 = 9.22, df = 1 (P = 0.00), I^2 =89%					



Analysis 4.1. Comparison 4 Mental health court, Outcome 1 Self report dichotomous criminal activity.

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 4 Mental health court

Outcome: 1 Self report dichotomous criminal activity

Study or subgroup	Experimental n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Weight	Risk Ratio M-H,Random,95% CI
Cosden 2003	104/137	71/98		100.0 %	1.05 [0.90, 1.22]
Total (95% CI)	**137**	**98**		**100.0 %**	**1.05 [0.90, 1.22]**

Total events: 104 (Experimental), 71 (Control)

Heterogeneity: not applicable

Test for overall effect: Z = 0.59 (P = 0.55)

Test for subgroup differences: Not applicable

Analysis 5.1. Comparison 5 Motivational interviewing and cognitive skills, Outcome 1 Self report drug use.

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 5 Motivational interviewing and cognitive skills

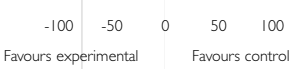
Outcome: 1 Self report drug use

Study or subgroup	Experimental N	Mean(SD)	Control N	Mean(SD)	Mean Difference IV,Random,95% CI	Weight	Mean Difference IV,Random,95% CI
Stein 2011	86	33.8 (39.44)	76	41.22 (42.64)		100.0 %	-7.42 [-20.12, 5.28]
Total (95% CI)	**86**		**76**			**100.0 %**	**-7.42 [-20.12, 5.28]**

Heterogeneity: not applicable

Test for overall effect: Z = 1.14 (P = 0.25)

Test for subgroup differences: Not applicable



ADDITIONAL TABLES

Table 1. Mental health diagnoses

Study, year	Criteria used for diagnoses	Description of mental health problem
Stein 2011	CES-D Scale	Scores > 16 indicate presence of significant depression. 69.8% had significant depressive symptoms
Sacks 2004a TC; Sacks 2004b TC + AC; Sullivan 2007	DIS	Diagnoses of lifetime Axis I or Axis II mental disorder Antisocial personality disorder
Cosden 2003	Determined by a psychiatrist/psychologist on the basis of a clinical interview and observations	Mood disorder Schizophrenia Bipolar disorder Other Dual diagnosis
Prendergast 2003; Prendergast 2004; Wexler 1999a; Wexler 1999b	Not specified	Antisocial personality disorder Phobias PTSD Depression Dysthymia Attention deficit hyperactivity disorder
Sacks 2011	DSM-IV diagnostic criteria Beck Depression Inventory Post Traumatic Stress Disorder Symptom Scale Brief Symptom Inventory Global Severity Index	Depression PTSD Psychological distress

CED-D: Centre for Epidemiological Studies - Depression; DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; DIS: Diagnostic Interview Schedule; PTSD: post-traumatic stress disorder.

Table 2. Summary research evidence for the meta-analyses

Paper, year	intervention	Comparison	Follow-up	Outcome type	Measurement	Actual outcome
Cosden 2003	Sentencing and case management (mental health treatment court and assertive community treatment case man-	Treatment as usual	6 months 12 months	Criminal activity dichotomous Self report drug use continuous	% and total mean and SD	% arrested and spent some time in jail % convicted of a new crime mean Addiction Severity In-

Table 2. Summary research evidence for the meta-analyses (*Continued*)

	agement)					dex (drug) composite score
Prendergast 2003 Prendergast 2004 Wexler 1999a; Wexler 1999b	Therapeutic community, counselling and aftercare	Treatment as usual and waiting list control	12, 24, 36 months up to 5 years	Biological drug use dichotomous Criminal activity continuous Criminal activity dichotomous Self report drug use dichotomous	% and total mean and SD	% testing positive for illicit drugs at 12 months' follow-up Mean months incarcerated in the year following release % any arrest % arrested for drug crime % arrested for property crime % arrested for violent crime % arrested for other crime % used drugs heavily in past year at 5 years Mean days until re-incarceration % re-incarcerated Mean days on parole to first return to custody % returned to prison within 3 years post parole
Sacks 2004a TC therapeutic community only Sacks 2004b TC + AC therapeutic community plus aftercare Sullivan 2007	Modified therapeutic community (personal reflections therapeutic community and voluntary residential aftercare)	Intensive psychiatric services	12 months	Criminal activity continuous Criminal activity dichotomous Self report drug use dichotomous	Mean and SD % and total	Mean number of days until incarceration Mean number of days until first crime % re-incarceration % criminal activity % alcohol/drug offence % other (non-

Table 2. Summary research evidence for the meta-analyses (*Continued*)

						alcohol/drug) offence % illegal drug use
Sacks 2011	Therapeutic community (re-entry modified)	Parole supervision case management	12 months	Criminal activity dichotomous	% with total	% re-incarcerated % self reported criminal activity
Stein 2011 (high depression score)	Motivational interviewing	Relaxation training	3 months	Self report drug use continuous	Mean and SD	Mean joins per day Mean % days used marijuana

SD: standard deviation.

APPENDICES

Appendix 1. Cochrane Central Register of Controlled Trials(CENTRAL) search strategy

CENTRAL search
1. prison*
2. offender*
3. (criminal* or probation or court*)
4. (secure next establishment*)
5. reoffend*
6. reincarcerat*
7. recidiv*
8. exoffend*
9. (jail or jails or incarcerat*)
10. (secure next facilit*)

(*Continued*)

11. (convict* or revocation or inmate* or (high next security))
12. PRISONERS
13. LAW ENFORCEMENT
14. JURISPRUDENCE
15. CRIME
16. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15
17. SUBSTANCE-RELATED DISORDERS
18. ((substance or drug*) next (abuse* or misuse* or dependen*or use* or addict*))
19. (narcotics or chemical or opiate) next (dependen* or addict* or abuse* or misuse*))
20. ((heroin) next (addict* or dependen* or misuse* or abuse*))
21. ((crack) next (addict* or dependen* or misuse* or abuse* or use*))
22. ((cocaine next addict*) or (cocaine next dependenc*) or (cocaine next misuse*) or (cocaine next abuse*) or (cocaine next use*))
23. ((amphetamine*) next (addict* or dependen* or misuse* or abuse* or use*))
24. (addicts or (dependence next disorder) or (drug next involved))
25. (street next drugs)
26. STREET DRUGS
27. DESIGNER DRUGS
28. NARCOTICS
29. COCAINE
30. AMPHETAMINES
31. ANALGESICS ADDICTIVE
32. ANALGESICS OPIOID
33. PSYCHOTROPIC DRUGS
34. opioid* or opiat*
35. #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34

(*Continued*)

35. (#16 and #35)

Appendix 2. MEDLINE search strategy

MEDLINE search
1. exp "Substance-Related-Disorders"/
2. ((drug or substance) adj (abuse* or addict* or dependen* or misuse*)).ti,ab
3. (drug* adj (treat* or intervention* or program*)
4. substance near (treat* or intervention* or program*)
5.(detox* or methadone) in ti,ab
6. narcotic* near (treat* or intervention* or program*)
7. 1 or 2 or 3 or 4 or 5 or 6
8. prison*. ti,ab
9. exp "Prisoners"/
10. offender* or criminal* or inmate* or convict* or probation* or remand or felon*).ti,ab
11. exp "Prisons"/
12. 8 or 9 or 10 or 11
13. 7 and 12

Appendix 3. EMBASE search strategy

Embase search
1. (detox$ or methadone or antagonist prescri$).ti,ab.
2. detoxification/ or drug detoxification/ or drug withdrawal/ or drug dependence treatment/ or methadone/ or methadone treatment/ or diamorphine/ or naltrexone/

(*Continued*)

3. (diamorphine or naltrexone or therapeutic communit$).ti,ab
4. morality/
5. (motivational interview$ or motivational enhancement).ti,ab
6. (counselling or counseling).ti,ab.
7. exp counseling/
8. (psychotherap$ or cognitive behavioral or cognitive behavioural).ti,ab
9. exp psychotherapy/
10. (moral adj3 training).ti,ab.
11. (cognitive restructuring or assertiveness training).ti,ab
12. reinforcement/ or self monitoring/ or self control/
13. (relaxation training or rational emotive or family relationship therap$).ti,ab
14. social learning/ or withdrawal syndrome/ or coping behavior/
15. (community reinforcement or self monitoring or self control or self management or interpersonal skills).ti,ab
16. (goal$ adj3 setting).ti,ab.
17. (social skills adj3 training).ti,ab.
18. anger/ or lifestyle/
19. (basic skills adj3 training).ti,ab.
20. (relapse adj3 prevent$).ti,ab.
21. (craving adj3 (minimi$ or reduc$)).ti,ab.
22. (trigger or triggers or coping skills or anger management or group work).ti,ab
23. (lifestyle adj3 modifi$).ti,ab.
24. (high intensity training or resettlement or throughcare or aftercare or after care).ti,ab
25. aftercare/ or halfway house/

(*Continued*)

26. (brief solution or brief intervention$ or minnesota program$ or 12 step$ or twelve step$).ti,ab
27. (needle exchange or nes or syringe exchange or dual diagnosis or narcotics anonymous).ti,ab
28. self help/ or support group/
29. (self-help or selfhelp or self help or outreach or bail support or arrest referral$).ti,ab
30. exp urinalysis/ or rehabilitation/ or rehabilitation center/
31. (diversion or dtto or dttos or drug treatment or testing order$ or carat or carats).ti,ab
32. (combined orders or drug-free or drug free).ti,ab.
33. (peer support or evaluation$ or urinalysis or drug testing or drug test or drug tests).ti,ab
34. ((rehab or rehabilitation or residential or discrete) adj2 (service$ or program$)).ti,ab
35. (asro or addressing substance$ or pasro or prisons addressing or acupuncture or shock or boot camp or boot camps).ti,ab
36. (work ethic camp$ or drug education or tasc or treatment accountability).ti,ab
37. exp acupuncture/
38. or/1-36
39. (remand or prison or prisoner or prisoners or offender$ or criminal$ or probation or court or courts).ti,ab
40. (secure establishment$ or secure facilit$).ti,ab.
41. (reoffend$ or reincarcerat$ or recidivi$ or ex-offender$ or jail or jails or goal or goals).ti,ab
42. (incarcerat$ or convict or convicts or convicted or felon or felons or conviction$ or revocation or inmate$ or high security).ti,ab
43. criminal justice/ or custody/ or detention/ or prison/ or prisoner/ or offender/ or probation/ or court/ or recidivism/ or crime/ or criminal behavior/ or punishment/
44. or/39-43
45. 38 and 44
46. (substance abuse$ or substance misuse$ or substance use$).ti,ab
47. (drug dependanc$ or drug abuse$ or drug use$ or drug misuse$ or drug addict$).ti,ab
48. (narcotics adj3 (addict$ or use$ or misuse$ or abuse$)).ti,ab

(*Continued*)

49. (chemical dependanc$ or opiates or heroin or crack or cocaine or amphetamines or addiction or dependance disorder or drug involved).ti,ab
50. substance abuse/ or drug abuse/ or analgesic agent abuse/ or drug abuse pattern/ or drug misuse/ or intravenous drug abuse/ or multiple drug abuse/
51. addiction/ or drug dependence/ or narcotic dependence/ or exp narcotic agent/ or narcotic analgesic agent/
52. opiate addiction/ or heroin dependence/ or morphine addiction/
53. cocaine/ or amphetamine derivative/ or psychotropic agent/
54. or/46-53
55. 45 and 54
56. limit 55 to yr=1980-2004

Appendix 4. PsycINFO search strategy

PsycINFO
1. (detoxification in de) or (drug withdrawal in de)
2. (drug usage screening in de) or (methadone maintenance) in de
3. explode "Narcotic-Antagonists" in DE
4. 1 or 2 or 3
5. (counseling in de) or (explode "psychotherapeutic-counseling" in de)
6. (explode "cognitive-therapy" in de) or (explode "psychotherapeutic-techniques" in de)
7. (cognitive restructuring in de) or (assertiveness training in de)
8. explode "relaxation-therapy" in de
9. (rational emotive therapy in de) or (rational-emotive therapy in de)
10. (explode "self monitoring" in de) or (explode self-monitoring) in de
11. (goal setting in de) or (self control in de) or (explode "self-management" in de)

(*Continued*)

12. (social skills in de) or (relapse prevention in de) or (craving in de) or (coping behavior in de)
13. (anger control in de) or (explode "group-psychotherapy" in de) or (brief psychotherapy in de)
14. (explode "behavior-modification" in de) or (posttreatment followup in de) or (aftercare in de)
15. (halfway houses in de) or (twelve step programs in de)
16. (dual diagnoses in de) or (explode "self help techniques" in de) or (outreach programs in de) or (court referrals in de)
17. (peer pressure in de) or (urinalysis in de)
18. (drug rehabilitation in de) or (residential care institutions in de) or (acupuncture in de) or (drug education in de)
19. (detox* or methadone or antagonist prescri* or diamorphine or naltrexone or therapeutic communit*) in ti,ab
20. (motivational interview* or motivational enhancemen* or counseling or psychotherapy or psychotherapies) in ti,ab
21. (cognitive behav* or cognitive therapy or cognitive therapies or moral training or cognitive restructuring) in ti,ab
22. (assertiveness training or relaxation training or relaxation therapy or relaxation therapies) in ti,ab
23. (rational emotive therap* or rational emotive behav* therap* or family relationship therap* or community reinforcement) in ti,ab
24. (self-monitor* or self monitor* or goal setting or self control or self-control or self management or self-management) in ti,ab
25. (interpersonal skills training or social skills training or basic skills training) in ti,ab
26. (relapse with prevent*) in ti,ab
27. (craving near reduc*) in ti,ab
28. craving with (reduc* in ti,ab)
29. (trigger* or coping skills or anger management or group work or lifestyle modif* or high intensity training or resettlement) in ti, ab
30. (throughcare or aftercare or after care or brief solution* or brief intervention*) in ti,ab
31. (minnesota or 12 step* or twelve step* or needle exchange or nes or syringe exchange or dual diagnosis) in ti,ab
32. (narcotics anonymous or self-help or self help or outreach or bail support or arrest referral*) in ti,ab
33. (diversion or dtto* or testing order* or carat* or counseling assessment referral or combined order or combined orders or drug free wing* or drug free environment*) in ti,ab

(*Continued*)

34. (peer support or user evaluations or urinalysis or urinalyses or mandatory drug test* or rehabilitation or discrete service* or discrete program*) in ti,ab
35. (residential program* or residential scheme* or asro or addressing substance* or pasro or prisons addressing substance) in ti,ab
36. (acupuncture or shock or boot camp* or work ethic or drug education or tasc or treatment accountability) in ti,ab
37. or/4-36
38. (secure facilities or convict* or revocation or inmate* or high security) in ti,ab
39. (prisoners in de) or (explode "correctional-institutions" in de)
40. (perpetrators in de) or (explode criminals in de)
41. (probation in de) or (parole in de) or (incarceration in de) or (recidivism in de) or (criminal conviction in de) or (crime in de)
42. (remand or prison* or offender* or criminal* or probation or court or courts or secure establishment* or reoffend* or reincarcerat* or recidivi* or ex-offender* or jail or jails or incarcerat*) in ti,ab
43. (drug abuse in de) or (explode "inhalant-abuse" in de) or (explode "drug-dependency" in de)
44. (polydrug abuse in de) or (drug abuse in de) or (intravenous drug usage in de)
45. (narcotic drugs in de) or (heroin in de) or (cocaine in de) or (explode amphetamine in de)
46. (substance abuse* or substance misuse* or substance user*) in ti,ab
47. (drug dependen* or drug abuse* or drug misuse* or drug addict* or drug use) in ti,ab
48. (narcotic abuse* or narcotic misuse* or chemical dependen* or opiate misuse* or opiate abuse*) in ti,ab
49. (heroin use* or heroin addict* or heroin misuse* or heroin abuse*) in ti,ab
50. (crack use* or crack addict* or crack misuse* or crack abuse*) in ti,ab
51. (cocaine use* or cocaine addict* or cocaine misuse* or cocaine abuse*) in ti,ab
52. (amphetamine* use* or amphetamine* addict* or amphetamine* misuse* or amphetamine* abuse*) in ti,ab
53. (dependence disorder or drug involved or dug-involved) in ti,ab
54. #38 or #39 or #40 or #41 or #42
55. #4 or #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53
56. #37 and #54 and #55

Appendix 5. PASCAL. SciSearch, Social SciSSciSearch, Wilson Applied Science and Technology Abstracts search strategy

PASCAL search
1. (DETOX? OR METHADONE OR ANTAGONIST()PRESCRI?)/TI,AB
2. METHADONE/DE OR NALTREXONE/DE
3. (DIAMORPHINE OR NALTREXONE)/TI,AB
4. THERAPEUTIC()COMMUNITY/DE OR THERAPEUTIC()COMMUNIT?)/TI,AB
5. (MOTIVATIONAL()INTERVIEW? OR MOTIVATIONAL()ENHANCEMENT)/TI,AB
6. (COUNSELLING OR COUNSELING)/TI,AB
7. COUNSELING/DE
8. (PSYCHOTHERAP? OR COGNITIVE()BEHAVIORAL OR COGNITIVE()BEHAVIOURAL)/TI,AB
9. PSYCHOTHERAPY!/DE
10. (MORAL(3W)TRAINING)/TI,AB
11. (COGNITIVE()RESTRUCTURING OR ASSERTIVENESS()TRAINING)/TI,AB
12. ASSERTIVENESS/DE OR RELAXATION()TECHNIQUES/DE
13. (RELAXATION()TRAINING OR RATIONAL()EMOTIVE OR FAMILY()RELATIONSHIP()THERAP?)/TI,AB
14. FAMILY()RELATIONS/DE
15. (COMMUNITY()REINFORCEMENT OR SELF()MONITORING OR SELF()CONTROL OR SELF()MANAGEMENT OR INTERPERSONAL()SKILLS)/TI,AB
16. (GOAL?(3W)SETTING)/TI,AB
17. (SOCIAL(3W)TRAINING)/TI,AB
18. SOCIAL RESPONSIBILITY/DE
19. (BASIC()SKILLS(3W)TRAINING)/TI,AB
20. (RELAPSE(3W)PREVENT?)/TI,AB
21. (CRAVING(3W)(MINIMI? OR REDUC?))/TI,AB
22. (TRIGGER OR TRIGGERS OR COPING()SKILLS OR ANGER()MANAGEMENT OR GROUP()WORK)/TI,AB

(*Continued*)

23. (LIFESTYLE(3W)MODIFI?)/TI,AB
24. (HIGH()INTENSITY()TRAINING OR RESETTLEMENT OR THROUGHCARE OR AFTERCARE OR AFTER()CARE) /TI,AB
25. ADAPTATION,-PSYCHOLOGICAL!/DE OR ANGER/DE OR LIFE()STYLE/DE OR AFTER()CARE/DE OR HALFWAY ()HOUSES/DE
26. (BRIEF()SOLUTION OR BRIEF()INTERVENTION? OR MINNESOTA()PROGRAM? OR 12()STEP? OR TWELVE() STEP?)/TI,AB
27. (NEEDLE()EXCHANGE OR NES OR SYRINGE()EXCHANGE OR DUAL()DIAGNOSIS OR NARCOTICS()ANONY-MOUS)/TI,AB
28. NEEDLE-EXCHANGE()PROGRAMS/DE
29. (SELF-HELP OR SELFHELP OR SELF()HELP OR OUTREACH OR BAIL()SUPPORT OR ARREST()REFERRAL?)/TI, AB
30. SELF-HELP()GROUPS/DE OR URINALYSIS/DE OR SUBSTANCE()ABUSE()DETECTION/DE
31. (DIVERSION OR DTTO OR DTTOS OR DRUG()TREATMENT OR TESTING()ORDER? ? OR CARAT OR CARATS) /TI,AB
32. (COMBINED()ORDERS OR DRUG-FREE OR DRUG()FREE)/TI,AB
33. (PEER()SUPPORT OR EVALUATION? ? OR URINALYSIS OR DRUG()TESTING OR DRUG()TEST? ?)/TI,AB
34. ((REHAB OR REHABILITATION OR RESIDENTIAL OR DISCRETE)(2W)(SERVICE? ? OR PROGRAM?))/TI,AB
35. (ASRO OR ADDRESSING()SUBSTANCE? OR PASRO OR PRISONS()ADDRESSING OR ACUPUNCTURE OR SHOCK OR BOOT()CAMP OR BOOT()CAMPS)/TI,AB
36. (WORK()ETHIC()CAMP? ? OR DRUG()EDUCATION OR TASC OR TREATMENT()ACCOUNTABILITY)/TI,AB
37. ACUPUNCTURE-THERAPY!/DE OR ACUPUNCTURE/DE OR HEALTH()EDUCATION/DE OR SUBSTANCE() ABUSE()TREATMENT()CENTERS/DE
38. S1:S3
39. S4:S37
40. S38 AND S39
40. (REMAND OR PRISON OR PRISONER OR PRISONERS OR OFFENDER? ? OR CRIMINAL? ? OR PROBATION OR COURT OR COURTS)/TI,AB
41. (SECURE()ESTABLISHMENT? ? OR SECURE()FACILIT?)/TI,AB

(*Continued*)

42. (REOFFEND? OR REINCARCERAT? OR RECIDIVI? OR EX()OFFENDER? ? OR JAIL OR JAILS)/TI,AB
43. (INCARCERAT? OR CONVICT OR CONVICTS OR CONVICTED OR FELON? ? OR CONVICTION? ? OR REVOCATION OR INMATE? ? OR HIGH()SECURITY)/TI,AB
44. PRISONERS/DE OR LAW()ENFORCEMENT/DE OR JURISPRUDENCE/DE
45. S40:S44
46. S40 AND S45
47. (SUBSTANCE()ABUSE? OR SUBSTANCE()MISUSE? OR SUBSTANCE()USE?)/TI,AB
48. (DRUG()DEPENDANC? OR DRUG()ABUSE? OR DRUG()USE? OR DRUG()MISUSE? OR DRUG()ADDICT?)/TI,AB
49. (NARCOTICS(3W)(ADDICT? OR USE? OR MISUSE? OR ABUSE?))/TI,AB
50. (CHEMICAL()DEPENDANC? OR OPIATES OR HEROIN OR CRACK OR COCAINE OR AMPHETAMINES OR ADDICTION OR DEPENDENCE()DISORDER OR DRUG()INVOLVED)/TI,AB
51. SUBSTANCE-RELATED()DISORDERS/DE OR AMPHETAMINE-RELATED()DISORDERS/DE OR COCAINE-RELATED()DISORDERS/DE OR MARIJUANA ()ABUSE/DE
52. OPIOID-RELATED-DISORDERS!/DE OR PHENCYCLIDINE()ABUSE/DE OR SUBSTANCE()ABUSE()INTRAVENOUS/DE
53. STREET()DRUGS/DE OR DESIGNER()DRUGS/DE OR NARCOTICS/DE
54. COCAINE!/DE OR AMPHETAMINES!/DE OR ANALGESICS()OPIOID/DE
55. S47:S54
56. S46 AND S55
57. (DETOXIFICATION OR METHADONE OR ANTAGONIST-PRESCRIBING)/DE FROM 144,34,434,7,99,65,35,6
58. (DIAMORPHINE OR NALTREXONE)/DE FROM 144,34,434,7,99,65,35,6
59. THERAPEUTIC-COMMUNITY)/DE FROM 144,34,434,7,99,65,35,6
60. (MOTIVATIONAL-INTERVIEW OR MOTIVATIONAL-ENHANCEMENT)/DE FROM 144,34,434,7,99,65,35,6
61. (COUNSELLING OR COUNSELING)/DE FROM 144,34,434,7,99,65,35,6
62. (PSYCHOTHERAPY! OR COGNITIVE-BEHAVIORAL OR COGNITIVE-BEHAVIOURAL)/DE FROM 144,34,434,7,99,65,35,6
63. (MORAL-TRAINING)/DE FROM 144,34,434,7,99,65,35,6

(*Continued*)

64. (COGNITIVE-RESTRUCTURING OR ASSERTIVENESS-TRAINING)/DE FROM 144,34,434,7,99,65,35,6
65. (RELAXATION-TRAINING OR RATIONAL-EMOTIVE OR FAMILY-RELATIONSHIP-THERAPY)/DE FROM 144,34,434,7,99,65,35,6
66. FAMILY-RELATIONS/DE
67. (COMMUNITY-REINFORCEMENT OR SELF-MONITORING OR SELF-CONTROL OR SELF-MANAGEMENT OR INTERPERSONAL-SKILLS)/DE FROM 44,34,434,7,99,65,35,6
68. (GOAL-SETTING)/DE FROM 144,34,434,7,99,65,35,6
69. (SOCIAL-SKILLS-TRAINING)/DE FROM 144,34,434,7,99,65,35,6
70. SOCIAL-RESPONSIBILITY/DE
71. (BASIC-SKILLS-TRAINING)/DE FROM 144,34,434,7,99,65,35,6
72. (RELAPSE-PREVENTION)/DE FROM 144,34,434,7,99,65,35,6
73. CRAVING/DE FROM 144,34,434,7,99,65,35,6
74. (TRIGGER OR COPING-SKILLS OR ANGER-MANAGEMENT OR GROUP-WORK)/DE FROM 144,34,434,7,99,65,35,6
75. (LIFESTYLE-MODIFICATION)/DE FROM 144,34,434,7,99,65,35,6
76. (HIGH-INTENSITY-TRAINING OR RESETTLEMENT OR THROUGHCARE OR AFTERCARE OR AFTER-CARE)/DE FROM 144,34,434,7,99,65,35,6
77. (BRIEF-SOLUTION OR BRIEF-INTERVENTIONS OR MINNESOTA-PROGRAM OR 12-STEP-PROGRAM OR TWELVE-STEP-PROGRAM)/DE FROM 144,34,434,7,99,65,35,6
77. (NEEDLE-EXCHANGE OR SYRINGE-EXCHANGE OR DUAL-DIAGNOSIS OR NARCOTICS-ANONYMOUS)/DE FROM 144,34,434,7,99,65,35,6
79. (SELF-HELP OR OUTREACH OR BAIL-SUPPORT OR ARREST-REFERRAL)/DE FROM 144,34,434,7,99,65,35,6
80. (DRUG-TREATMENT OR TESTING-ORDERS OR CARAT)/DE FROM 144,34,434,7,99,65,35,6
81. (COMBINED-ORDERS OR DRUG-FREE)/DE FROM 144,34,434,7,99,65,35,6
82. (PEER-SUPPORT OR EVALUATION OR URINALYSIS OR DRUG-TESTING OR DRUG-TESTS)/DE FROM 144,34,434,7,99,65,35,6
83. (REHABILITATION OR RESIDENTIAL OR DISCRETE-SERVICES)/DE FROM 144,34,434,7,99,65,35,6
84. (ASRO OR PASRO ACUPUNCTURE OR BOOT-CAMP)/DE FROM 144,34,434,7,99,65,35,6

(*Continued*)

85. (WORK-ETHIC-CAMP OR DRUG-EDUCATION OR TASC OR TREATMENT-ACCOUNTABILITY)/DE FROM 144,34,434,7,99,65,35,6
86. (REMAND OR PRISON OR PRISONER OR PRISONERS OR OFFENDER OR OFFENDERS OR CRIMINAL OR CRIMINALS OR PROBATION OR COURT OR COURTS)/DE FROM 144,34,434,7,99,65,35,6
87. (SECURE-ESTABLISHMENTS OR SECURE-FACILITY)/DE FROM 144,34,434,7,99,65,35,6
88. (REOFFENDERS OR REINCARCERATION OR RECIDIVISM OR EX-OFFENDERS OR JAILS)/DE FROM 144,34,434,7,99,65,35,6
89. (INCARCERATION OR CONVICT OR CONVICTS OR FELON OR FELONS OR CONVICTIONS OR REVOCATION OR INMATE OR INMATES OR HIGH-SECURITY)/DE FROM 144,34,434,7,99,65,35,6
90. (SUBSTANCE-ABUSE OR SUBSTANCE-MISUSE OR SUBSTANCE-USE)/DE FROM 144,34,434,7,99,65,35,6
91. (DRUG-DEPENDANCE OR DRUG-DEPENDENCY OR DRUG-ABUSE OR DRUG-MISUSE OR DRUG-ADDICT OR DRUG-ADDICTION)/DE FROM 144,34,434,7,99,65,35,6
92. (CHEMICAL-DEPENDANCY OR OPIATE-DEPENDENCY OR HEROIN-DEPENDENCY OR CRACK-DEPENDENCY OR COCAINE-DEPENDENCY OR AMPHETAMINES OR ADDICTION OR DEPENDENCE-DISORDER OR DRUG-INVOLVED)/DE FROM 144,34,434,7,99,65,35,6
93. S40 OR S57:S85
94. S45 OR S86:S89
95. S55 OR S90:S92
96. S93 AND S94 AND S95
97. S96/1980-2004

Appendix 6. ASSIA search strategy

ASSIA search
1. remand
2. prison or prisoner or prisoners
3. offender*
4. criminal*
5. probation

(*Continued*)

6. court or courts
7. tribunal or tribunals
8. secure establishment*
9. secure facilit*
10. reoffend*
11. reincarcerat*
12. recidivi*
13. ex-offender*
14. jail or jails
15. incarcerat*
16. convict or convicts
17. convicted
18. felon or felons
19. conviction*
20. reconviction*
21. high security
22. law enforcement
23. Substance abuse* or substance misuse* or substance use*
24. drug dependanc* or drug abuse* or drug use*
25. drug misuse* or drug addict*
26. narcotics addict* narcotics use* narcotics misuse* narcotics abuse*
27. chemical dependanc*
28. opiates
29. heroin
30. crack

(*Continued*)

31. cocaine
32. amphetamines
33. cocaine
34. addiction
35. dependence disorder*
36. drug involved
37. Substance-related disorders
38. amphetamine-related disorders
39. cocaine-related disorders
40. marijuana abuse
41. opioid-related disorders
42. street drugs
43. designer drugs
44. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22
45. 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43
46. 44 and 45

Appendix 7. Sociological Abstracts search strategy

Sociological Abstrac
1. remand in de
2. detention in de
3. prisoners in de
4. prisons in de
5. offenders in de

(*Continued*)

6. parole in de
7. probation in de
8. correctional system in de
9. courts in de
10. imprisonment in de
11. criminal justice in de
12. criminal proceedings in de
13. recidivism in de
14. jail in de
15. institutionalization (persons) in de
16. conviction/convictions in de
17. (remand or prison* or offender* or criminal* or probation or court or courts or secure establishment*) in ti,ab
18. (reoffend* or reincarcerat* or recidivi* or ex-offend* or jail or jails or incarcerat* or secure facilit* or convict* or revocation or inmate*) in ti,ab
19. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19
20. substance abuse in de
21. explode "Drug-Abuse" in DE
22. "Drug-Injection" in DE
23. explode "Narcotic-Drugs" in DE
24. "Cocaine-" in DE
25. "Addiction-" in DE
26. explode "Psychedelic-Drugs" in DE
27. (substance abuse* or substance misuse* or substance use*) in ti,ab
28. (drug abuse* or drug misuse* or drug use*) in ti,ab
29. (drug dependenc* or drug addict* or narcotics abuse* or narcotics use* or narcotics misuse* or narcotics addict*) in ti,ab

(*Continued*)

30. (chemical dependenc* or opiate abuse* or opiate misuse* or opiate use* or opiate addict*) in ti,ab
31. (heroin abuse* or heroin misuse* or heroin use* or heroin addict*) in ti,ab
32. (crack abuse* or crack misuse* or crack use* or crack addict*) in ti,ab
33. (cocaine abuse* or cocaine misuse* or cocaine use* or cocaine addict*) in ti,ab
34. (amphetamine* abuse* or amphetamine* misuse* or amphetamine* use* or amphetamine* addict*) in ti,ab
35. (dependence disorder or drug involved) in ti,ab
36. #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35
37. #19 and #36
38. "Detoxification-" in DE
39. "Methadone-Maintenance" in DE
40. "Counseling-" in DE
41. "Psychotherapy-" in DE
42. "Assertiveness-" in DE
43. (detoxification in de) or (methadone maintenance in de) or (treatment programs in de)
44. (counseling in de) or (psychotherapy in de) or (assertiveness in de) or (group therapy in de) or (goals in de) or (self control in de)
45. (interpersonal communication in de) or (social interaction in de) or (social competence in de) or (coping in de)
46. (social behavior in de) or (group work in de) or (lifestyle in de)
47. (after care in de) or (support networks in de) or (self help in de) or (self help groups in de) or (outreach programmes in de)
48. (outreach programs in de) or (referral in de) or (delinquency prevention in de) or (diversion/diversions in de)
49. (peer groups in de) or (peer influence in de) or (drug use screening in de) or (rehabilitation in de) or (work experience in de)
50. (detox* or methadone maintenance or methadone prescri* or antagonist prescri* or dimorphine or naltrexone) in ti,ab
51. (therapeutic communit* or motivational interview* or motivational enhance* or counseling or counselling or psychotherapy or cognitive behavi*) in ti,ab
52. (moral training or cognitive restructuring or assertiveness training or relaxation training) in ti,ab

(*Continued*)

53. (rational-emotive or rational emotive or family relationship therap* or community reinforcement or self monitoring or goal setting or self control training) in ti,ab
54. (self management or interpersonal skills or social skills or basic skills or relapse prevent* or prevent* relapse or craving reduc* or reduc* craving) in ti,ab
55. (trigger* or coping skills or anger management or group work or lifestyle modif* or high intensity training or resettlement or throughcare) in ti,ab
56. (aftercare or after care or brief solution or brief intervention* or 12 step* or twelve step* or minnesota program* or needle exchange or nes) in ti,ab
57. (syringe exchange or dual diagnosis or narcotics anonymous or self help or selfhelp or outreach or bail support) in ti,ab
58. (arrest referral* or diversion or dtto or dttos or drug treatment or carat or carats or counseling assessment or combined orders) in ti,ab
59. (drug-free or drug free or peer support or evaluation* or urinalysis or drug testing or drug use screen* or rehabilitation or discrete service* or discrete program*) in ti,ab
60. (residential program* or residential scheme* or residential service*) in ti,ab
61. (asro or addressing substance or pasro or prisons addressing or acupuncture or shock or boot camp*) in ti,ab
62. (work ethic or drug education or tasc or treatment accountability) in ti,ab
63. #38 or #39 #or #40 or #41 or #42 or #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53 or #54 or # 55 or #56 or #57 or #58 or #59 or #60 or #61 or #62
64. #37 and #63

Appendix 8. HMIC search strategy

HMIC
1. remand in de
2. detention in de
3. prisoners in de
4. prisons in de
5. offenders in de

(*Continued*)

6. parole in de
7. probation in de
8. correctional system in de
9. courts in de
10. imprisonment in de
11. criminal justice in de
12. criminal proceedings in de
13. recidivism in de
14. jail in de
15. institutionalization (persons) in de
16. conviction/convictions in de
17. (remand or prison* or offender* or criminal* or probation or court or courts or secure establishment*) in ti,ab
18. (reoffend* or reincarcerat* or recidivi* or ex-offend* or jail or jails or incarcerat* or secure facilit* or convict* or revocation or inmate*) in ti,ab
19. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18
20. substance abuse in de
21. explode "Drug-Abuse" in DE
22. "Drug-Injection" in DE
23. explode "Narcotic-Drugs" in DE
24. "Cocaine-" in DE
25. "Addiction-" in DE
26. explode "Psychedelic-Drugs" in DE
27. (substance abuse* or substance misuse* or substance use*) in ti,ab
28. (drug abuse* or drug misuse* or drug use*) in ti,ab
29. (drug dependenc* or drug addict* or narcotics abuse* or narcotics use* or narcotics misuse* or narcotics addict*) in ti,ab

(*Continued*)

30. (chemical dependenc* or opiate abuse* or opiate misuse* or opiate use* or opiate addict*) in ti,ab
31. (heroin abuse* or heroin misuse* or heroin use* or heroin addict*) in ti,ab
32. (crack abuse* or crack misuse* or crack use* or crack addict*) in ti,ab
33. (cocaine abuse* or cocaine misuse* or cocaine use* or cocaine addict*) in ti,ab
34. (amphetamine* abuse* or amphetamine* misuse* or amphetamine* use* or amphetamine* addict*) in ti,ab
35. (dependence disorder or drug involved) in ti,ab
36. #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35
37. #19 and #36

Appendix 9. PAIS search strategy

PAIS
1. ((reoffend* or reincarcerat* or recidivi* or ex-offend* or jail or jails or incarcerat* or secure facilit* or convict* or revocation or inmate*) in ti,ab)
2. ((remand or prison* or offender* or criminal* or probation or court or courts or secure establishment*) in ti,ab)
3. ((drug dependenc* or drug addict* or narcotics abuse* or narcotics use* or narcotics misuse* or narcotics addict*) in ti,ab)
4. ((drug abuse* or drug misuse* or drug use*) in ti,ab) or ((substance abuse* or substance misuse* or substance use*) in ti,ab)
5. ((detox* or methadone maintenance or methadone prescri* or antagonist prescri* or dimorphine or naltrexone) in ti,ab)
6. ((dependence disorder or drug involved) in ti,ab)
7. ((amphetamine* abuse* or amphetamine* misuse* or amphetamine* use* or amphetamine* addict*) in ti,ab)
8. ((cocaine abuse* or cocaine misuse* or cocaine use* or cocaine addict*) in ti,ab)
9. ((crack abuse* or crack misuse* or crack use* or crack addict*) in ti,ab)
10. ((heroin abuse* or heroin misuse* or heroin use* or heroin addict*) in ti,ab)
11. ((chemical dependenc* or opiate abuse* or opiate misuse* or opiate use* or opiate addict*) in ti,ab)
12. ((moral training or cognitive restructuring or assertiveness training or relaxation training) in ti,ab)

(*Continued*)

13. ((therapeutic communit* or motivational interview* or motivational enhance* or counseling or counselling or psychotherapy or cognitive behavi*) in ti,ab)
14. ((work ethic or drug education or tasc or treatment accountability) in ti,ab)
15. ((asro or addressing substance or pasro or prisons addressing or acupuncture or shock or boot camp*) in ti,ab)
16. ((arrest referral* or diversion or dtto or dttos or drug treatment or carat or carats or counseling assessment or combined orders) in ti,ab)
17. ((residential program* or residential scheme* or residential service*) in ti,ab)
18. ((syringe exchange or dual diagnosis or narcotics anonymous or self help or selfhelp or outreach or bail support) in ti,ab)
19. ((drug-free or drug free or peer support or evaluation* or urinalysis or drug testing or drug use screen* or rehabilitation or discrete service* or discrete program*) in ti,ab)
20. ((aftercare or after care or brief solution or brief intervention* or 12 step* or twelve step* or minnesota program* or needle exchange or nes) in ti,ab)
21. ((trigger* or coping skills or anger management or group work or lifestyle modif* or high intensity training or resettlement or throughcare) in ti,ab)
22. ((self management or interpersonal skills or social skills or basic skills or relapse prevent* or prevent* relapse or craving reduc* or reduc* craving) in ti,ab)
24. ((rational-emotive or rational emotive or family relationship therap* or community reinforcement or self monitoring or goal setting or self control training) in ti,ab)
25. #1 or #2
26. #3 or #4 or #5 or #6 or #7 or #8 or 9 or #10 or #11
27. #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24
28. 25 and #26 and #27

Appendix 10. SIGLE search strategy

SIGLE
1. ((reoffend* or reincarcerat* or recidivi* or ex-offend* or jail or jails or incarcerat* or secure facilit* or convict* or revocation or inmate*) in ti,ab)
2. ((remand or prison* or offender* or criminal* or probation or court or courts or secure establishment*) in ti,ab
3. ((drug dependenc* or drug addict* or narcotics abuse* or narcotics use* or narcotics misuse* or narcotics addict*) in ti,ab
4. ((drug abuse* or drug misuse* or drug use*) in ti,ab
5. ((substance abuse* or substance misuse* or substance use*) in ti,ab
6. ((detox* or methadone maintenance or methadone prescri* or antagonist prescri* or dimorphine or naltrexone) in ti,ab
7. ((dependence disorder or drug involved) in ti,ab
8. ((amphetamine* abuse* or amphetamine* misuse* or amphetamine* use* or amphetamine* addict*) in ti,ab
9. ((cocaine abuse* or cocaine misuse* or cocaine use* or cocaine addict*) in ti,ab
10. ((crack abuse* or crack misuse* or crack use* or crack addict*) in ti,ab
11. ((heroin abuse* or heroin misuse* or heroin use* or heroin addict*) in ti,ab
12. ((chemical dependenc* or opiate abuse* or opiate misuse* or opiate use* or opiate addict*) in ti,ab
13. #1 or #2
14. #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12
15. #13 and #14

Appendix 11. Criminal Justice Abstracts search strategy

CJA search
1. (substance abuse* or substance misuse* or substance use or substance users) in ti,ab,de
2. substance related in ti,ab,de
3. drug related in ti,ab,de
4. (drug dependenc* or drug abuse* or drug misuse* or drug use or drug users or drug addiction) in ti,ab,de

(*Continued*)

5. (narcotics use or narcotics users or narcotics abuse* or narcotics misuse* or chemical dependenc*) in ti,ab,de
6. (opiates or heroin or crack or cocaine or amphetamines or addict or addicts or addicted or dependence disorder* or drug involved) in ti,ab,de
7. (designer drugs or street drugs or polydrug misuse* or polydrug abuse*) in ti,ab,de
8. #1 or #2 or #3 or #4 or #5 or #6 or #7
9. ((antagonist near prescri*) or diamorphine or naltrexone) in ti,ab,de
10. (therapeutic communit* or (motivational near interview*)) in ti,ab,de
11. (motivational near enhancement) in ti,ab,de
12. (counselling or counseling) in ti,ab,de
13. (psychotherap* or cognitive behav* or behav* therap* or (moral near training)) in ti,ab,de
14. (cognitive restructuring or (assertiveness near train*) or relaxation training) in ti,ab,de
15. (rational emotive or family relationship therap*) in ti,ab,de
16. (community reinforcement or self monitoring or goal setting or goalsetting) in ti,ab,de
17. (self control near training) in ti,ab,de
18. (self management) in ti,ab,de
19. (interpersonal skills near training) in ti,ab,de
20. ((social skills or basic skills) near training) in ti,ab,de
21. ((relapse near prevent*) or (craving near reduc*)) in ti,ab,de
22. (trigger* or coping skills or anger management or group work or (lifestyle near modif*)) in ti,ab,de
23. (high intensity training or resettlement or throughcare or aftercare or after care) in ti,ab,de
24. (brief solution* or brief intervention*) in ti,ab,de
25. (minnesota in ti,ab) in ti,ab,de
26. (12 step* or twelve step*) in ti,ab,de
27. (needle exchange or nes or syringe exchange) in ti,ab,de

(*Continued*)

28. (dual diagnosis or narcotics anonymous or self help or selfhelp or outreach) in ti,ab,de
29. (bail support or bail program* or arrest referral* or diversion or dtto* or drug treatment) in ti,ab,de
30. (carat or counselling assessment or counseling assessment) in ti,ab,de
31. (combined order* or drug free wing* or drug free environment* or peer support) in ti,ab,de
32. (user evaluations or urinalys* or urinanalys* or drug test* or rehab* or discrete service*) in ti,ab,de
33. (discrete program* or residential program* or residential scheme*) in ti,ab,de
34. (asro or addressing substance*) in ti,ab,de
35. (pasro or prisons addressing) in ti,ab,de
36. (acupuncture or shock or boot camp or boot camps or work ethic camp*) in ti,ab,de
37. (drug education or tasc or treatment accountability) in ti,ab,de
38. (detoxification or detox or methadone maintenance or (methadone near prescri*)) in ti,ab,de
39. #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29
40. #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39
41. #39 or #40
42. #8 and #41

Appendix 12. National Research Register search strategy

NRR search
1. REMAND
2. PRISON*
3. OFFENDER*
4. ((CRIMINAL* or PROBATION) or COURT) or COURTS)
5. (SECURE next ESTABLISHMENT*)

(*Continued*)

6. REOFFEND*
7. REINCARCERAT*
8. RECIDIV*
9. EXOFFEND*
10. ((JAIL or JAILS) or INCARCERAT*)
11. (SECURE next FACILIT*)
12. (((CONVICT* or REVOCATION) or INMATE*) OR (HIGH next SECURITY))
13. PRISONERS:ME
14. LAW-ENFORCEMENT:ME
15. JURISPRUDENCE:ME
16. CRIME:ME
17. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10
18. #11 or #12 or #13 or #14 or #15 or #16
19. #17 or #18
20. ((SUBSTANCE next ABUSE*) or (SUBSTANCE next MISUSE*)) OR (DRUG NEXT DEPENDENC*)) OR (DRUG NEXT ABUSE*)) OR (DRUG NEXT MISUSE*)) OR (DRUG NEXT USE*)) OR (DRUG NEXT ADDICTION))
21. ((NARCOTICS or (CHEMICAL next DEPENDENC*)) OR (OPIATE NEXT ADDICT*)) OR (OPIATE NEXT DEPENDENC*)) OR (OPIATE NEXT ABUSE*)) OR (OPIATE NEXT MISUSE*))
22. ((HEROIN next ADDICT*) or (HEROIN next DEPENDENC*)) OR (HEROIN NEXT MISUSE*)) OR (HEROIN NEXT ABUSE*))
23. ((CRACK next ADDICT*) or (CRACK next DEPENDENC*)) OR (CRACK NEXT MISUSE*)) OR (CRACK NEXT ABUSE*)) OR (CRACK NEXT USE*))
24. ((COCAINE next ADDICT*) or (COCAINE next DEPENDENC*)) OR (COCAINE NEXT MISUSE*)) OR (COCAINE NEXT ABUSE*)) OR (COCAINE NEXT USE*))
25. ((AMPHETAMINE* next ADDICT*) or (AMPHETAMINE* next DEPENDENC*)) OR (AMPHETAMINE* NEXT MISUSE*)) OR (AMPHETAMINE* NEXT ABUSE*)) OR (AMPHETAMINE* NEXT USE*))
26. ((ADDICTS or (DEPENDENCE next DISORDER)) OR (DRUG NEXT INVOLVED))
27. (SUBSTANCE-RELATED and DISORDERS:ME)

(*Continued*)

28. SUBSTANCE-RELATED-DISORDERS:ME
29. AMPHETAMINE-ABUSE:ME
30. COCAINE-ABUSE:ME
31. MARIJUANA-ABUSE:ME
32. OPIOID-RELATED-DISORDERS:ME
33. PHENCYCLIDINE-ABUSE:ME
34. SUBSTANCE-ABUSE-INTRAVENOUS:ME
35. SUBSTANCE-WITHDRAWAL-SYNDROME:ME
36. (STREET next DRUGS)
38. STREET-DRUGS:ME
39. DESIGNER-DRUGS:ME
40. NARCOTICS:ME
41. (COCAINE:ME or AMPHETAMINES:ME)
42. ANALGESICS-ADDICTIVE:ME
43. ANALGESICS-OPIOID:ME
44. PSYCHOTROPIC-DRUGS:ME
45. #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42 or #43 or #44
46. 19 and 45

Appendix 13. SPECTRA search strategy

SPECTRA search
1. {remand} or {prison} or {offender} or {criminal} or {probation} or {court} or {tribunal} or {secure establishment} or {secure facilit} or {reoffend} or {reincarcerat} or {recidivi} or {ex-offender} or {jail} or {incarcerat} or {convict} or {felon} or {reconvict} or {high security} or {law enforcement} {remand} or {prison} or {offender} or {criminal} or {probation} or {court} or {tribunal} or {secure establishment} or {secure facilit} or {reoffend} or {reincarcerat} or {recidivi} or {ex-offender} or {jail} or {incarcerat} or {convict} or {felon} or {reconvict} or {high security}

(*Continued*)

or {law enforcement}
2. {substance} or {dependenc} or {drug abuse} or {drug use} or {drug misuse} or {addict} All indexed fields: {remand} or {prison} or {offender} or {criminal} or {probation} or {court} or {tribunal} or {secure establishment} or {secure facilit} or {reoffend} or {reincarcerat} or {recidivi} or {ex-offender} or {jail} or {incarcerat} or {convict} or {felon} or {reconvict} or {high security} or {law enforcement} OR All unindexed fields: {remand} or {prison} or {offender} or {criminal} or {probation} or {court} or {tribunal} or {secure establishment} or {secure facilit} or {reoffend} or {reincarcerat} or {recidivi} or {ex-offender} or {jail} or {incarcerat} or {convict} or {felon} or {reconvict} or {high security} or {law enforcement} AND All unindexed fields: {substance} or {dependenc} or {drug abuse} or {drug use} or {drug misuse} or {addict} or {narcotics} or {opiates} or {heroin} or {crack} or {cocaine} or {amphetamines} or {drug involved} or {substance-related} or {amphetamine-related} or {cocaine-related} or {marijuana} or {opioid} or {street drug} or {designer drug}
3. narcotics
4. opiates
5. heroin
6. {crack}
7. cocaine
8. amphetamines
9. drug involved
10. substance-related
11. amphetamine-related
12. cocaine-related
13. marijuana
14. opioid
15. street drug
16. designer drug
17. 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16
18. 1 AND 17

Appendix 14. Criteria for assessing risk of bias

Item	Judgement	Description
1. Random sequence generation (selection bias)	Low risk	The investigators describe a random component in the sequence generation process such as: random number table; computer random number generator; coin tossing; shuffling cards or envelopes; throwing dice; drawing of lots; minimisation
	High risk	The investigators describe a non-random component in the sequence generation process such as: odd or even date of birth; date (or day) of admission; hospital or clinic record number; alternation; judgement of the clinician; results of a laboratory test or a series of tests; availability of the intervention
	Unclear risk	Insufficient information about the sequence generation process to permit judgement of low or high risk
2. Allocation concealment (selection bias)	Low risk	Investigators enrolling participants could not foresee assignment because 1 of the following, or an equivalent method, was used to conceal allocation: central allocation (including telephone, web-based, and pharmacy-controlled, randomisation); sequentially numbered drug containers of identical appearance; sequentially numbered, opaque, sealed envelopes
	High risk	Investigators enrolling participants could possibly foresee assignments because 1 of the following method was used: open random allocation schedule (e.g. a list of random numbers); assignment envelopes without appropriate safeguards (e.g. if envelopes were unsealed or nonopaque or not sequentially numbered); alternation or rotation; date of birth; case record number; any other explicitly unconcealed procedure
	Unclear risk	Insufficient information to permit judgement of low or high risk This is usually the case if the method of concealment is not described or not described in sufficient detail to allow a definite judgement
3. Blinding of participants and providers (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is not likely to be influenced by lack of blinding; blinding of participants and key study personnel ensured, and unlikely that the blinding could have been broken
4. Blinding of participants and providers (performance bias) Subjective outcomes	Low risk	Blinding of participants and providers and unlikely that the blinding could have been broken
	High risk	No blinding or incomplete blinding, and the outcome is likely to be influenced by lack of blinding Blinding of key study participants and personnel attempted, but likely

(*Continued*)

		that the blinding could have been broken, and the outcome is likely to be influenced by lack of blinding
	Unclear risk	Insufficient information to permit judgement of low or high risk
5. Blinding of outcome assessor (detection bias) Objective outcomes	Low risk	No blinding of outcome assessment, but the review authors judge that the outcome measurement is not likely to be influenced by lack of blinding Blinding of outcome assessment ensured, and unlikely that the blinding could have been broken
6. Blinding of outcome assessor (detection bias) Subjective outcomes	Low risk	No blinding of outcome assessment, but the review authors judge that the outcome measurement is not likely to be influenced by lack of blinding Blinding of outcome assessment ensured, and unlikely that the blinding could have been broken
	High risk	No blinding of outcome assessment, and the outcome measurement is likely to be influenced by lack of blinding Blinding of outcome assessment, but likely that the blinding could have been broken, and the outcome measurement is likely to be influenced by lack of blinding
	Unclear risk	Insufficient information to permit judgement of low or high risk
7. Incomplete outcome data (attrition bias) For all outcomes except retention in treatment or drop-out	Low risk	No missing outcome data Reasons for missing outcome data unlikely to be related to true outcome (for survival data, censoring unlikely to be introducing bias) Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk not enough to have a clinically relevant impact on the intervention effect estimate For continuous outcome data, plausible effect size (difference in means or standardised difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size Missing data have been imputed using appropriate methods All randomised patients are reported/analysed in the group they were allocated to by randomisation irrespective of non-compliance and co-interventions (intention to treat)
	High risk	Reason for missing outcome data likely to be related to true outcome, with either imbalance in numbers or reasons for missing data across intervention groups For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate For continuous outcome data, plausible effect size (difference in means or standardised difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size 'As-treated' analysis done with substantial departure of the intervention

(*Continued*)

		received from that assigned at randomisation
	Unclear risk	Insufficient information to permit judgement of low or high risk (e.g. number randomised not stated, no reasons for missing data provided; number of drop-out not reported for each group)
8. Selective reporting (reporting bias)	Low risk	The study protocol is available and all of the study's pre-specified (primary and secondary) outcomes that are of interest in the review have been reported in the pre-specified way The study protocol is not available but it is clear that the published reports include all expected outcomes, including those that were pre-specified (convincing text of this nature may be uncommon)
	High risk	Not all of the study's pre-specified primary outcomes have been reported 1 or more primary outcomes is reported using measurements, analysis methods or subsets of the data (e.g. subscales) that were not pre-specified 1 or more reported primary outcomes were not pre-specified (unless clear justification for their reporting is provided, such as an unexpected adverse effect) 1 or more outcomes of interest in the review are reported incompletely so that they cannot be entered in a meta-analysis The study report fails to include results for a key outcome that would be expected to have been reported for such a study
	Unclear risk	Insufficient information to permit judgement of low or high risk
9. Other bias *	Low risk	Evidence to suggest other problems identified with the study which might threaten the validity of the random allocation, attrition or data integrity and results of the trial
	High risk	Evidence to suggest that the trial might be underpowered/problems with the random allocation process leading to potential self selection bias/ issues of analysis not conducted using intent to treat analysis or evidence of missing data. Concerns of attrition and measurement error including reliance on self report measures
	Unclear risk	Insufficient information to permit judgement of low or high risk

WHAT'S NEW

Last assessed as up-to-date: 10 October 2013.

Date	Event	Description
28 May 2012	New search has been performed	This review has been updated using searches to 21st March 2013. The review represents one in a family of four reviews. The reviews cover pharmacological, non pharmacological and drug using female offenders. This review of interventions with drug-using offenders with co-occurring mental illness contains eight randomised controlled trials. Three of the eight trials are awaiting classification to the review, the remaining five represent a total of 1,502 participants
2 October 2011	New search has been performed	The updated edit of this review produced a new document with additional findings with searches up to 11th November 2011. Five new authors have been added to this version of the review. These include Steven Duffy, Rachael McCool, Matthew Neilson, Catherine Hewitt and Marrissa Martyn-St James
1 July 2011	Amended	Converted to new review format.
8 June 2011	New search has been performed	Review has been substantially updated

HISTORY

Review first published: Issue 1, 2014

Date	Event	Description
19 May 2006	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

JMG and SBD constructed and conducted searches.

AP, MN and RP inspected the search hits by reading the titles and abstracts.

MMSTJ, JMG, RMCc, SBD and MN conducted the data extraction for the papers.

CG conducted a data extraction and narrative summary of the cost-effectiveness studies.

MMSTJ, MN, CH and AP compiled and organised results

All review authors contributed towards the final draft text.

DECLARATIONS OF INTEREST

None.

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Internal sources

- Reviewer from Cochrane Drugs and Alcohol Group, Not specified.

A reviewer from the Drugs and Alcohol Group provided the researchers with the results of a search strategy for three databases

External sources

- The Department of Health funded the original review, UK.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

None.

INDEX TERMS

Medical Subject Headings (MeSH)

Case Management; Crime [prevention & control; statistics & numerical data]; Diagnosis, Dual (Psychiatry); Law Enforcement; Mental Disorders [*therapy]; Motivational Interviewing; Randomized Controlled Trials as Topic; Substance-Related Disorders [*therapy]; Therapeutic Community

MeSH check words

Adolescent; Adult; Female; Humans; Male; Young Adult